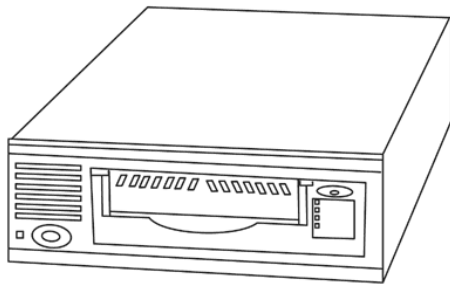


### Overview

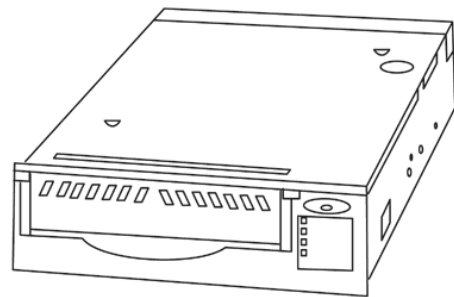
Our family of HP StorageWorks Ultrium tape drives is HP's premier line of backup devices. Based on LTO Ultrium format, an open standard with a well-defined four-generation roadmap, the HP Ultrium tape drives offer customers the best choice for investment protection. With ultimate reliability and ease of use in mind, even at 100% duty cycles, HP's rugged design builds on superior LTO technology and adds advanced features to create a new level of data protection. The tape drives employ dynamic data rate matching to adjust to the speed of the host, reducing wear and tear on both drive and media and increasing performance, even on slower hosts. HP's ultra-durable soft-load feature automatically positions the data cartridge, and the highly reliable HP leader-capture mechanism virtually eliminates lost leaders, increasing the success of your backup and restore operations. Support for HP One-Button Disaster Recovery provides the easiest way to restore data in the event of a disaster. If data is critical to your business, protect it with an HP StorageWorks Ultrium tape drive.

### HP StorageWorks Ultrium 215

As the entry point for HP's Ultrium tape drive family, the HP StorageWorks Ultrium 215 tape drive offers superdrive capacity in a compact half-height form factor that makes it easy to integrate into desktop workstations and servers. An ideal solution for network backup where capacity and low cost of ownership are critical, the Ultrium 215 stores 200 GB of compressed data on a single tape at up to 54 GB per hour.



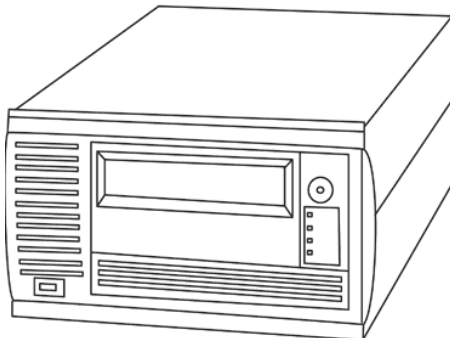
Ultrium 215e



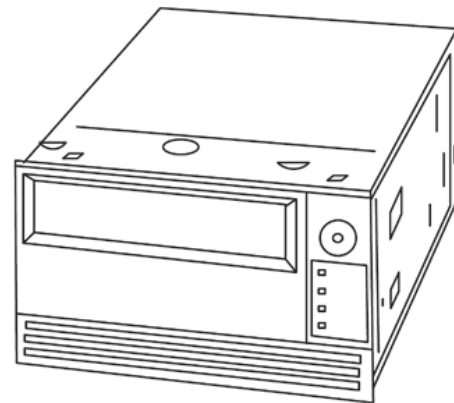
Ultrium 215i

### HP StorageWorks Ultrium 230

The HP StorageWorks Ultrium 230 tape drive is the high-performance, first-generation superdrive in the HP Ultrium family. The Ultrium 230 drive offers excellent capacity, superior performance and exceptional reliability. An ideal solution for high-end network server backup where speed, capacity and reliability are critical, the Ultrium 230 stores 200 GB of compressed data on a single tape at speeds of up to 30 MB/sec, backing up 108 GB per hour.



Ultrium 230e

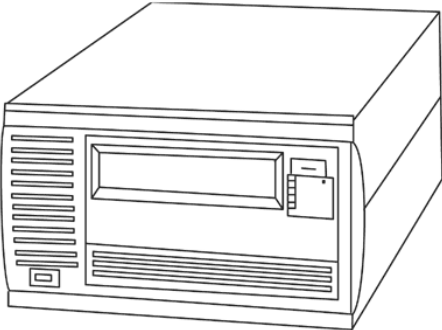


Ultrium 230i

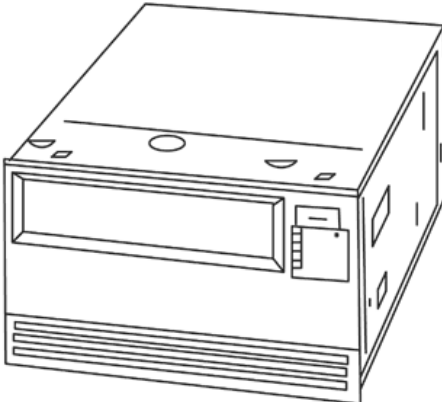
### HP StorageWorks Ultrium 460

The HP StorageWorks Ultrium 460 tape drive is the latest generation of HP's Ultrium tape drive family, delivering a capacity of 400 GB of compressed data on a single cartridge. With a transfer rate of 60 MB/sec, the Ultrium 460 is the ideal choice for enterprise-class data protection needs, particularly where the backup window is shrinking. The Ultrium 460 tape drive is fully read and write compatible with the first generation of Ultrium tape drives while setting new standards for performance, capacity and reliability.

Overview



Ultrium 460e



Ultrium 460i

### Models

<b>Ultrium 215 Tape Drive</b>	Ultrium 215 for ProLiant, Internal (carbon) <b>NOTE:</b> For HP ProLiant servers.	Q1543A
	Ultrium 215 for ProLiant, External (carbon) <b>NOTE:</b> For HP ProLiant servers.	Q1544A
	Ultrium 215, Internal (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7420A
	Ultrium 215, External (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7421B
	Ultrium 215, Array Module (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7492A
	Ultrium 215 Array Module, Factory-racked (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7492A#0D1
	<hr/>	
<b>Ultrium 230 Tape Drive</b>	Ultrium 230 for ProLiant, Internal (carbon) <b>NOTE:</b> For HP ProLiant and Alphaservers.	Q1515A
	Ultrium 230 for ProLiant, External (carbon) <b>NOTE:</b> For HP ProLiant and Alphaservers.	Q1516A
	Ultrium 230, Internal (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7400A
	Ultrium 230, External (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7401B
	Ultrium 230, Array Module (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7470A
	Ultrium 230 Array Module, Factory-racked (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	C7470A#0D1
	<hr/>	
<b>Ultrium 460 Tape Drive</b>	Ultrium 460 for ProLiant, Internal (carbon) <b>NOTE:</b> For HP ProLiant and Alphaservers.	Q1518A
	Ultrium 460 for ProLiant, External (carbon) <b>NOTE:</b> For HP ProLiant and Alphaservers.	Q1519A
	Ultrium 460, Internal (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	Q1508A
	Ultrium 460, External (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	Q1509A
	Ultrium 460, Array Module (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	Q1512A
	Ultrium 460 Array Module, Factory-racked (flint grey) <b>NOTE:</b> For HP-UX and third-party servers.	Q1512A#0D1
	<hr/>	

### Models

### Key Features

- HP One-Button Disaster Recovery (OBDR) restores your entire system at the touch of a button
  - High-capacity drive that stores 200 GB (Ultrium 215, Ultrium 230) or 400 GB (Ultrium 460) on a single cartridge with 2:1 compression
  - Data rate matching automatically adjusts drive to the speed of the server and network environment, which increases performance, reduces mechanical wear on the drive, and extends tape life
  - Fully read-and-write compatible with the HP StorageWorks Ultrium tape drives and Ultrium from other manufacturers
  - Includes a single-server copy of Yosemite TapeWare backup software with disaster recovery option ([Ultrium 215 and Ultrium 230 only](#))
  - Active head cleaning provides automated cleaning that increases head life and reduces the need for using the cleaning cartridge
  - Lower power consumption for maximum reliability at minimum cost
  - Internal, external, and rack-mounted models available
  - HP Library & Tape Tools included to help with installation, management, and troubleshooting
  - Soft-load feature automatically takes the data cartridge and moves it into the load position
  - Advanced tape leader capture design ensures fail-safe cartridge loading
- 

### Customer Benefits

- **Dependable:** sets new standards for data integrity and state-of-the-art reliability along with the advantages of a legacy free roadmap that defines best-of-breed technologies for current and future generations
- **High-capacity:** stores all your data on a single cartridge
- **Fast:** minimizes network interruption
- **Easy:** supports One-Button Disaster Recovery (OBDR), simply the easiest way to restore data in the event of a disaster
- **Affordable:** high capacity combined with low media cost delivers an exceptionally low cost of ownership
- **Manageable:** includes superior management capabilities that makes it easy to install, use and support
- **Well-connected:** compatible with leading operating systems, backup software and servers
- **Future-proof:** delivers a compelling technology roadmap, doubling speed and capacity each generation
- **Open:** based on LTO technology, which delivers the competitive benefits of an open format
- **Reliable:** high-integrity data path including read and write DRAM protects your data

### Product Highlights

#### LTO Ultrium Technology

Linear Tape-Open technology was developed by three leaders in the storage industry -HP, IBM, and Seagate - who brought together their combined expertise in tape technology to develop an entirely new format based on the best of existing technologies. Because LTO Ultrium technology was a new format, it required no cumbersome support of legacy formats, so it could be designed without compromising on reliability or performance. The LTO Program, a consortium of the three technology provider companies, has developed a well-defined four-generation roadmap, which has been executed right on schedule, with the first generation of Ultrium drives and media released in 2000 and the second generation in 2002.

Ultrium 1 tape drive technology uses a linear format of 384 tracks, writing eight tracks simultaneously. Ultrium 2 tape drive technology uses a linear format of 512 tracks, writing eight tracks simultaneously. The data is written in a serpentine pattern; the tape reverses direction after each set of eight tracks is written. This provides higher density recording, enabling customers to lower costs and increase efficiency by storing more data on a single tape in an industry standard format. Tapes written on the HP StorageWorks Ultrium 215 and Ultrium 230 tape drives can be interchanged directly with each other and with Ultrium 1 and 2 tape drives from HP and other vendors. Tapes written on the HP StorageWorks Ultrium 460 tape drives can be interchanged directly with Ultrium 2 tape drives from other vendors.

LTO data compression (LTO-DC) is an enhanced version of Advanced Lossless Data Compression (ALDC) hardware compression. Compression is automatically turned "off" if the compressed data would cause an overall expansion in data size, hence optimizing the available capacity on the media. The system is used in both Ultrium 1 and Ultrium 2 products.

The decision about what next technology you should buy into should be based on your future, not your past, investment. Choose the Ultrium format when you need the following advantages:

- Maximum reliability, capacity and performance
- Compatibility with a broad range of operating systems and servers (e.g., a mixed system environment)
- A legacy-free technology that uses the best attributes from a wide range of tape technologies without any compromises for backward compatibility requirements
- A solid roadmap for future generations of the technology
- An open format available from multiple vendors
- Lowest media cost of any 'superdrive' tape technology

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#### Data Rate Matching

An exclusive feature of HP Ultrium tape drives, data rate matching allows the tape drive to adjust its transfer rate to the speed of host dynamically and continuously. Data rate matching keeps the data to the drive "streaming," reducing the need to rewind the tape back and forth to wait for the host (the "shoeshining" effect). This feature brings two big advantages:

- It optimizes performance, getting the best performance possible for the environment, regardless of the speed of the host or the network.
- It reduces wear and tear on drive and media, thus increasing reliability.

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#### HP OBDR (One-Button Disaster Recovery)

With HP One-Button Disaster Recovery, you can quickly, reliably and simply restore your entire system just by inserting the most recent backup tape and pushing one button on the tape drive. Your HP StorageWorks Ultrium tape drive will restore your operating system, configuration, applications, drivers and data files. There's no longer a need to search for software disks and manuals, plus with downtime reduced, the costs of recovery are minimized. There's no need to make a new set of disaster recovery disks each time the network configuration is altered or a peripheral is added. Recovering from a disaster manually at a stressful time makes for an error-prone process. The sheer simplicity of HP One-Button Disaster Recovery means less human error. Backup and disaster recovery preparation - previously two separate tasks - become one process. OBDR is simply the best disaster recovery product for small to medium systems. For a current list of servers, workstations, and software that support OBDR, check the tape backup compatibility pages on our Web site at: <http://www.hp.com/go/connect>.

**NOTE:** This Web site is available in English only.

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#### HP Ultrium Storage Media

HP's test program for HP Ultrium media is probably the most thorough and comprehensive in the industry. 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. Over 1 million test hours on media and drives per year ensure that HP cartridges will always offer maximum reliability even in the most extreme conditions.

### Product Highlights

#### Management

HP Ultrium tape drives are supported, by HP Library & Tape Tools (LTT) version 2.9 onwards. This tool is intended to help in the installation and maintenance of HP tape drives and devices, including:

- Diagnostic tools for tape drive and tape automation devices, designed to simplify troubleshooting
- Multiple options for retrieving firmware information and updating it

Instructions and download of LTT are available at: [http://www.hp.com/country/us/eng/software\\_drivers.htm](http://www.hp.com/country/us/eng/software_drivers.htm) (search for your specific drive model)

**NOTE:** This Web site is available in English only.

### Compatibility

#### Compatibility

HP's extensive compatibility testing program assures that your HP StorageWorks Ultrium tape drive works with leading servers, operating systems, and backup applications - and not just those sold by HP. HP Ultrium tape drives work seamlessly in many environments, making them especially suitable if you have a mixed system environment. For the latest list of servers, workstations, operating systems, and backup software that support HP Ultrium tape drives, check the tape backup compatibility pages on our Web site at: <http://www.hp.com/go/connect>.

**NOTE:** This Web site is available in English only.

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#### HP Server Compatibility

The HP StorageWorks Ultrium tape drives are supported on the following classes of HP systems:

- HP ProLiant DL servers
- HP ProLiant ML servers
- HP 9000 servers
- HP rx and rp series servers
- HP tc series servers
- HP workstations

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

**NOTE:** This Web site is available in English only.

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#### Termination

No terminator is required for internal models (assumes use of terminated cable). The external model features "auto-termination" - no terminator is required.

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#### Performance Tuning

You will need to connect the drive to a dedicated SCSI Host Bus Adaptor (HBA), use Ultra 160 HBA or higher (e.g., HP part number 268351-B21 or C7474A). To supply data to the drive fast enough to achieve full performance from an Ultrium 460 drive, you will need at least eight disks as part of a RAID5 array with read cache enabled. You can test the speed of your system with tools provided at <http://www.hp.com/support/pat>.

To achieve full performance from your tape drive, do not use the native backup application within the operating system (e.g., NT® Backup, Windows® 2000 Backup). For full details of supported backup applications, see <http://www.hp.com/products1/storage/compatibility/tapebackup/index.html>

**NOTE:** These Web sites are available in English only.

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#### OS Support

Microsoft® Windows, Novell NetWare, HP-UX, Linux Kernel, Red Hat Linux 64-bit, IBM-AIX, SUN Solaris, Intel® Solaris, SGI IRIX, and other operating systems. The Ultrium 215 Tape Drive also qualified with Microsoft Windows 98 and XP Pro.

**NOTE:** Please visit <http://www.hp.com/go/connect> for the latest compatibility information.

**NOTE:** This Web site is available in English only.

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#### Backup Software Support

Supported with HP OpenView Storage Data Protector, VERITAS Backup Exec, BrightStor ARCserve IT, Yosemite Technologies TapeWare IT 2000, Legato Networker, Dantz Retrospect, Tivoli TSM, NovaBackup, UltraBac and other backup applications

**NOTE:** Please visit <http://www.hp.com/go/connect> for the latest compatibility information.

**NOTE:** This Web site is available in English only.

### Service and Support, HP Care Pack and Warranty Information

**Warranty** 3-year parts exchange, next business day response, 9x5 phone support

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**Warranty Upgrade Options**

- Response - Upgrade on-site response from next business day to same day 4-hours
- Coverage - Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days

HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage

- HP Care Pack is not available for less than the product's warranty duration
- HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required
- HP Care Pack services are prepaid
- For additional HP Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL listed below:

<http://h18005.www1.hp.com/services/carepaq/index.html>

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**Support Services**

HP Services provides a three-year, limited warranty, fully supported by a worldwide network of resellers and service providers and 9x5 hardware technical phone support during the warranty period. In addition, available service offerings include a full range of optional packaged hardware and software services:

- Installation and start up
- Extended coverage hours and enhanced response times
- System management and performance services
- Availability and recovery services



### Options

#### Related Options

Host Bus Adapters and Controllers for ProLiant Servers	Smart Array 5i Controller (integrated on system board)	N/A
	<b>NOTE:</b> This controller is integrated on HP ProLiant DL380 G2 and DL380 G3 servers.	
	64-Bit/133-MHz Dual Channel Ultra320 SCSI Adapter	268351-B21
	64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS	284688-B21
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Media	HP Ultrium 200 GB data cartridge	C7971A
	HP Ultrium pre-labeled 200 GB data cartridge	C7971L
	HP Ultrium 400 GB data cartridge	C7972A
	<b>NOTE:</b> Supports Ultrium 460 only.	
	HP Ultrium universal cleaning cartridge	C7978A
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Rackmount Options	3U Rackmount Kit	274338-B21
	<b>NOTE:</b> For racked ProLiant servers. No drives included. Accommodates up to four internal half-height drives (such as the Ultrium 215) or two full-height drives (such as the Ultrium 230 or Ultrium 460).	
	<b>NOTE:</b> Please refer to web page for further information: <a href="http://h18006.www1.hp.com/products/storageworks/3urackmount/index.html">http://h18006.www1.hp.com/products/storageworks/3urackmount/index.html</a>	
	<b>NOTE:</b> This Web site is available in English only.	
	5U Rackmount Kit	274339-B21
	<b>NOTE:</b> For racked ProLiant servers. No drives included. Accommodates up to four internal full-height drives (such as Ultrium 230 or Ultrium 460).	
<b>NOTE:</b> Please refer to web page for further information: <a href="http://h18006.www1.hp.com/products/storageworks/5urackmount/index.html">http://h18006.www1.hp.com/products/storageworks/5urackmount/index.html</a>		
<b>NOTE:</b> This Web site is available in English only.		
	Tape Array 5300	C7508A
<b>NOTE:</b> For racked HP-UX servers and other industry-standard racks. Holds up to four warm-swap half-height drives (such as the Ultrium 215 array module or a DVD-ROM drive) or up to two warm-swap full-height drives (such as the Ultrium 230 or Ultrium 460 array modules).		
<b>NOTE:</b> Please refer to web page for further information: <a href="http://www.hp.com/products1/storage/products/tapebackup/tapearrays/tapearray5300/index.html">http://www.hp.com/products1/storage/products/tapebackup/tapearrays/tapearray5300/index.html</a>		
<b>NOTE:</b> This Web site is available in English only.		
	Redundant, warm-swap power supply and fan for Tape Array 5300	C7496A
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Cable Kits and Rail Kits for HP ProLiant Models	<b>NOTE:</b> The following Cable Kits and Rail Kits for HP ProLiant options support part numbers Q1543A, Q1544A, Q1545A, Q1515A, Q1516A, Q1517A, Q1518A, Q1519A, Q1520A.	
	68-pin HD/68-pin VHDCI, 12 ft/3.66 m SCSI cable for external drives	341177-B21
	68-pin HD/68-pin HD, 16.40 ft/5 m SCSI cable for external drives	328215-001
	68-pin HD/68-pin HD, 32.81 ft/10 m SCSI cable for external drives	328215-002
	68-pin HD/VHDCI LVD SCSI cable kit (for use with 3U Rackmount Kit)	168048-B21
	68-Pin HD/68-Pin HD SCSI cable kit (for use with 3U Rackmount Kit)	242381-B21

### Options

#### Accessories for "Open-Connect" Models

**NOTE:** The following Accessories for "Open Connect" models support part numbers C7400A, C7401B, C7420A, C7421B, Q1508A, Q1509A.

0.9m external SCSI cable (68-pin high density to 68-pin high density, LVD/SE Ultra2)	C5741A
2.5m external SCSI cable (68-pin high density to 68-pin high density, LVD/SE Ultra2)	C5743A
External SCSI terminator (LVD/SE multimode)	C5738A
Internal cable adapter (68-pin to 50 pin male ribbon cable adapter)	C7423A
1.0m internal SCSI cable (4 connector, 68-way, terminated, LVD/SE Ultra2)	C7424A
PCI Wide Ultra2 host bus adapter	C7430A
68-pin HD to 68-pin VHD, LVD/SE Ultra2 SCSI adapter	C7434A
Rail kits for Dell PowerEdge servers 2100 & 2200	C5731A

#### HP Care Pack Options for ProLiant Models

**NOTE:** The following HP Care Pack Options for ProLiant Models support part numbers Q1543A, Q1544A, Q1545A, Q1515A, Q1516A, Q1517A, Q1518A, Q1519A, Q1520A.

3 years, next business day response, 9x5 on-site coverage	127258-002
3 years, 4-hour response, 9x5 on-site coverage	127261-002
3 years, 4-hour response, 24x7 on-site coverage	127264-002
Hardware installation	127334-002
3 years, next business day response, 9x5 on-site coverage (Electronic PN)	FM-T1XEC-36
3 years, 4-hour response, 9x5 on-site coverage (Electronic PN)	FM-T14EC-36
3 years, 4-hour response, 24x7 on-site coverage (Electronic PN)	FM-T17EC-36
Hardware installation (Electronic PN)	FM-T11INS-EC

**NOTE:** For additional hardware installation and maintenance information please refer to the URLs listed below:

HP Care Pack Installation: <http://h18005.www1.hp.com/services/carepaq/us/install/>

HP Care Pack Maintenance: <http://h18005.www1.hp.com/services/carepaq/us/hardware/>

#### SupportPack Options for "Open Connect" Models

**NOTE:** The following SupportPack Options for "Open Connect" Models support part numbers C7400A, C7401B, C7470A, C7420A, C7421B, C7492A, Q1508A, Q1509A, Q1512A.

3 years, Express Exchange	H5511A
3 years, next business day response, on-site coverage	H3157A
3 years, same-day response, on-site coverage	H4617A
3 years, 24x7 coverage, on-site coverage	H4622A
3 years, Express Exchange (Electronic PN)	H5511E
3 years, next business day response, on-site coverage (Electronic PN)	H3157E
3 years, same-day response, on-site coverage (Electronic PN)	H4617E
3 years, 24x7 coverage, on-site coverage (Electronic PN)	H4622E

**NOTE:** For additional hardware installation and maintenance information please refer to the URLs listed below:

HP Care Pack Installation: <http://h18005.www1.hp.com/services/carepaq/us/install/>

HP Care Pack Maintenance: <http://h18005.www1.hp.com/services/carepaq/us/hardware/>

### Kit Contents

### Options

Model Name	Kit Contents Description	Part Number
<b>Ultrium 215 tape drives</b>		
Ultrium 215 Internal for ProLiant (carbon)	HP StorageWorks Ultrium 215 internal tape drive, HP StorageWorks Tape CD-ROM (contains HP StorageWorks Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; ProLiant mounting rails; documentation	Q1543A
Ultrium 215 External for ProLiant (carbon)	HP StorageWorks Ultrium 215 external tape drive, HP StorageWorks Tape CD-ROM (contains HP StorageWorks Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; power cord; 68-pin HD to 68-pin VHDCI multi-mode SCSI cable (5183-2675); documentation	Q1544A
Ultrium 215 Internal (flint grey)	HP StorageWorks Ultrium 215 internal tape drive, HP StorageWorks Tape CD-ROM (contains HP StorageWorks Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; mounting rails; documentation	C7420A
Ultrium 215 External (flint grey)	HP StorageWorks Ultrium 215 external tape drive, HP StorageWorks Tape CD-ROM (contains HP StorageWorks Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; power cord; 68-pin HD to 68-pin VHDCI multi-mode SCSI cable (5183-2675); documentation	C7421B
Ultrium 215 Array Module (flint grey) (works with HP Tape Array 5300)	HP Ultrium 215 warm-swap array module, HP StorageWorks Tape CD-ROM (includes HP StorageWorks Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; documentation	C7492A

Model Name	Kit Contents Description	Part Number
<b>Ultrium 230 tape drives</b>		
Ultrium 230 Internal for ProLiant (carbon)	HP Ultrium 230 internal tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; SCSI ribbon cable with switchable LVD/SE terminator (269157-009); HP Ultrium 2 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; mounting rails; documentation	Q1515A
Ultrium 230 External for ProLiant (carbon)	HP Ultrium 230 external tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 2 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; power cord; 68-pin HD to 68-pin VHDCI multi-mode SCSI cable (5183-2675); 68-pin HD to 68-pin HD SCSI cable (189646-002); SCSI terminator; documentation	Q1516A
Ultrium 230 Internal (flint grey)	HP Ultrium 230 internal tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 2 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; mounting rails; documentation	C7400A
Ultrium 230 External (flint grey)	HP Ultrium 230 external tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 2 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; power cord; 68-pin HD to 68-pin VHDCI multi-mode SCSI cable (5183-2675); documentation	C7401A
Ultrium 230 Array Module (flint grey) - works with HP Tape Array 5300	HP Ultrium 230 warm-swap array module, HP StorageWorks Tape CD-ROM (includes HP Library & Tape Tools utilities and user manuals); TapeWare backup software on CD-ROM; HP Ultrium 2 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; documentation	C7470A

### Options

Model Name	Kit Contents Description	Part Number
<b>Ultrium 460 tape drives</b>		
Ultrium 460 Internal for ProLiant (carbon)	HP Ultrium 460 internal tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); SCSI ribbon cable with switchable LVD/SE terminator (269157-009); HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; mounting rails; documentation	Q1518A
Ultrium 460 External for ProLiant (carbon)	HP Ultrium 460 external tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; power cord; 68-pin HD to 68-pin VHDCI multi-mode SCSI cable (5183-2675); 68-pin HD to 68-pin HD SCSI cable (189646-002); SCSI terminator; documentation	Q1519A
Ultrium 460 Internal (flint grey)	HP Ultrium 460 internal tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; mounting rails; documentation	Q1508A
Ultrium 460 External (flint grey)	HP Ultrium 460 external tape drive, HP StorageWorks Tape CD-ROM (contains HP Library & Tape Tools utilities and user manuals); HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; power cord; 68-pin HD to 68-pin VHDCI multi-mode SCSI cable (5183-2675); documentation	Q1509A
Ultrium 460 Array Module (flint grey) - works with HP Tape Array 5300	HP Ultrium 460 warm-swap array module, HP StorageWorks Tape CD-ROM (includes HP Library & Tape Tools utilities and user manuals); HP Ultrium 1 data cartridge (200 GB); Ultrium cleaning cartridge; multi-language labels; documentation	Q1512A

### Technical Specifications

#### HP Ultrium Tape Drive Specifications

Dimensions		Ultrium 215	Ultrium 230	Ultrium 460
	<b>Form Factor</b>	5¼-inch half-height	5¼-inch full-height	5¼-inch full-height
	<b>Physical (HxWxD) Internal</b>	1.6 x 5.8 x 8.7 in (4.06 x 14.7 x 22.1 cm)	3.25 x 5.75 x 8.0 in (8.3 x 14.6 x 20.3 cm)	3.25 x 5.75 x 8.0 in (8.3 x 14.6 x 20.3 cm)
	<b>Physical (HxWxD) External</b>	2.7 x 8.1 x 11.4 in (6.9 x 20.6 x 29 cm)	4.8 x 8.2 x 11.7 in (12.2 x 20.8 x 29.8 cm)	4.6 x 8.2 x 11.5 in (11.8 x 20.8 x 29.2 cm)
	<b>Array Module</b>	1.7 x 6.5 x 11.2 in (4.3 x 16.5 x 28.4 cm)	6.3 x 3.4 x 11.9 in (16.1 x 8.7 x 30.3 cm)	6.3 x 3.4 x 11.9 in (16.1 x 8.7 x 30.3 cm)
	<b>Shipping (HxWxD) Internal</b>	13.4 x 11.8 x 15.4 in (34 x 30 x 39.1 cm)	15.25 x 15.5 x 17.38 in (38.7 x 39.4 x 44.1 cm)	15.25 x 15.5 x 17.38 in (38.7 x 39.4 x 44.1 cm)
	<b>Shipping (HxWxD) External</b>	15.4 x 14.2 x 17.7 in (39.1 x 36.1 x 45 cm)	17.5 x 14.2 x 18.5 in (44.4 x 35.9 x 47 cm)	17.5 x 14.2 x 18.5 in (44.4 x 35.9 x 47 cm)
	<b>Array Module</b>	18.4 x 10.6 x 13.0 in (46.7 x 27 x 33 cm)	10.2 x 13.4 x 18.1 in (26 x 34 x 46 cm)	10.2 x 13.4 x 18.1 in (26 x 34 x 46 cm)
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Weight		Ultrium 215	Ultrium 230	Ultrium 460
	<b>Out of box Internal</b>	3.35 lb (1.52 kg)	4.2 lb (1.9 kg)	4.6 lb (2.1 kg)
	<b>Out of box External</b>	10.45 lb (4.74 kg)	11.7 lb (5.3 kg)	12.1 lb (5.5 kg)
	<b>Array Module</b>	4.1 lb (1.87 kg)	7.9 lb (3.6 kg)	7.88 lb (3.6 kg)
	<b>Shipping Internal</b>	7.7 lb (3.5 kg)	11.0 lb (4.0 kg)	11.0 lb (4.0 kg)
	<b>Shipping External</b>	14.3 lb (6.5 kg)	19.5 lb (8.8 kg)	19.5 lb (8.8 kg)
	<b>Array Module</b>	9.7 lb (4.4 kg)	9.9 lb (3.6 kg)	9.9 lb (3.6 kg)
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Capacity and Performance		Ultrium 215	Ultrium 230	Ultrium 460
	<b>Capacity</b>	100 GB (200 GB per cartridge at 54 GB per hour with 2:1 compression)	100 GB (200 GB per cartridge at 108 GB per hour with 2:1 compression)	200 GB (400 GB per cartridge at 228 GB per hour with 2:1 compression)
	<b>Sustained transfer rate</b>	7.5 MB/s native (15 MB/s with 2:1 compression)	15 MB/s native (30 MB/s with 2:1 compression)	30 MB/s native with Ultrium 2 media (60 MB/s with 2:1 compression) 20 MB/s native with Ultrium 1 media (40 MB/s with 2:1 compression)
	<b>Burst transfer rate</b>	80 MB/s (with Ultra2 SCSI wide)	80 MB/s (with Ultra2 SCSI wide)	160 MB/s (with Ultra3 SCSI wide)
	<b>Data rate matching range</b>	6-7.5 MB/s (native)	6-15 MB/s (native)	10-32 MB/s (native)
	<b>Data access time (from BOT)</b>	142s typical for a 100 GB tape (native)	71s typical for a 100 GB tape (native)	71s typical for a 200 GB tape (native)
	<b>Load to BOT</b>	<16s typical	<25s typical	<19s typical
	<b>Unload from BOT</b>	<16s typical	<13s typical	<13s typical
	<b>Rewind time from EOT</b>	284s for a 100 GB tape (native)	142s (100 GB tape)	84s (200 GB tape)
	<b>Rewind tape speed</b>	2.05 m/s	4.1 m/s	7.25 m/s

### Technical Specifications

<b>Memory, Compression and Recording Format</b>	<b>Memory buffer</b>	16 MB (Ultrium 215, Ultrium 230) 64 MB (Ultrium 460)
	<b>Compression technique</b>	LTO-DC dual-mode compression (an enhanced version of ALDC)
	<b>Logical recording format</b>	LTO Ultrium generation 1 (Ultrium 215, Ultrium 230) LTO Ultrium generation 2 (Ultrium 460)
	<b>Recording technology</b>	8-channel linear serpentine recording on half-inch media
	<b>Media compatibility</b>	LTO Ultrium1 (609 m ± 1m Metal Particle (MP++) formulation with 4K Cartridge Memory) LTO Ultrium 2 (609m, 1/2" tape, Metal Particle (MP++) formulation with 4K Cartridge Memory) (Ultrium 460 only)

<b>Reliability</b>	<b>MTBF</b>	250,000 hours at 100% duty cycle
	<b>Error detection/correction</b>	Reed-Solomon
	<b>Corrected error rate</b>	1 in 1x10 <sup>17</sup> bits

<b>Interface</b>	<b>Interface type</b>	Wide Ultra2 SCSI (LVDS) (Ultrium 215, Ultrium 230) Wide Ultra3 SCSI (LVDS) (Ultrium 460)
	<b>SCSI connector</b>	Internal: 68-pin LVDS External: 68-pin HD LVDS Array module: 80-pin SCA (SCSI and power)

<b>Power Specifications</b>		<b>Ultrium 215</b>	<b>Ultrium 230</b>	<b>Ultrium 460</b>
	<b>Power Requirements</b>			
	<b>Internal</b>	+5V @ 3.5A (typical) +5V @ 4.0A (max) +12V @ 0.3A (typical) +12V @ 1.7A (max)	+5V @ 5.2A (typical) +5V @ 6.3A (max) +12V @ 0.7A (typical) +12V @ 2.75A (max)	+5V @ 3.2A (typical) +5V @ 6.3A (max) +12V @ 0.7A (typical) +12V @ 2.75A (max)
	<b>External</b>	100-240 VAC, 50/60 Hz (auto-ranging), 0.7A max Power connection IEC 320	100-240 VAC, 50/60 Hz (auto-ranging), 0.7A max Power connection IEC 320	100-240 VAC, 50/60 Hz (auto-ranging), 0.7A max Power connection IEC 320
	<b>Array Module</b>	+5V @ 3.5A (typical) +5V @ 4.0A (max) +12V @ 0.3A (typical) +12V @ 1.7A (max)	+5V @ 5.2A (typical) +5V @ 6.3A (max) +12V @ 0.7A (typical) +12V @ 2.75A (max)	+5V @ 5.2A (typical) +5V @ 6.3A (max) +12V @ 0.7A (typical) +12V @ 2.75A (max)
	<b>Power consumption</b>	21 watts typical	Min 20 W (idle), max 32 W (writing)	Min 18 W (idle), max 32 W (writing)

<b>Environmental Specifications</b>	<b>Temperature range</b>	Operating: 50° F to 95° F (10° C to 35° C) Storage: -40° F to 151° F (-40° C to 66° C)
	<b>Humidity range</b>	Operating: 20 to 80% RH (non-condensing) Storage: 10 to 95% RH (non-condensing)

### Technical Specifications

#### Front Panel LED Indicators

<b>Ready</b> (top light, green) <i>This LED indicates power on or activity.</i>	On, steady	The drive is ready for use. It is powered up but not doing anything.
	On, flashing	The drive is busy. For example: it is carrying out Write, Read, Self Test or firmware download.
	Flashing pattern	The drive is in OBDR mode.
	Off	The drive power is off or there was a failure during self-test.
<b>Drive Error</b> (second light, amber) <i>This LED indicates a drive error.</i>	Off	No fault has been detected.
	On, flashing	The drive has suffered an unrecoverable hardware failure. A power cycle or a successful tape load will turn off the LED, but if the hardware fault is still present it will come on again if the same operation is performed.
<b>Tape Error</b> (third light, amber) <i>This LED indicates a tape error.</i>	Off	No fault has been detected.
	On, flashing	The tape currently in the drive is faulty. This LED could come on for a number of reasons, but they all relate to the tape being in error in some way, such as unreadable cartridge memory or unsupported tape. Do not use the cartridge; replace it. The LED will go out when a tape load is started.
<b>Use Cleaning Cartridge or Clean</b> (bottom light, amber) <i>This LED indicates when a cleaning tape should be used.</i>	On, steady	A cleaning cartridge is being used. The Ready light will also flash.
	On, flashing	The drive needs cleaning. The light will continue to flash if the drive is power cycled, and will only go out after a supported cleaning tape has been used.
	Off	The drive does not require cleaning.

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