

QuickSpecs

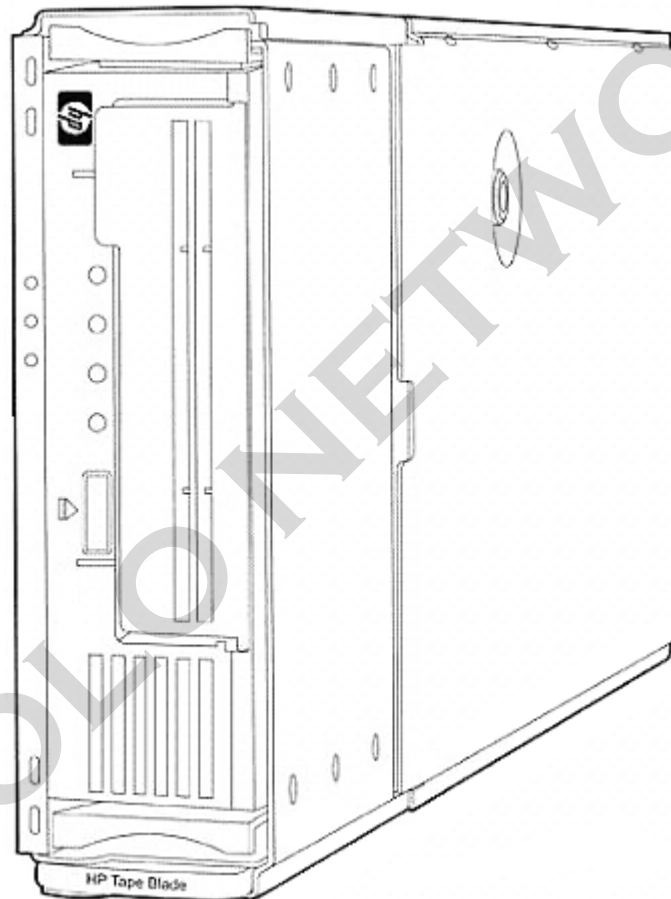
HP StorageWorks Ultrium Tape Blades

Overview

HP StorageWorks Ultrium Tape Blades

The HP StorageWorks Ultrium Tape Blades are ideal for HP BladeSystem c-Class customers who need an integrated data protection solution. These half-height tape blades provide direct attach data protection for the adjacent server and network backup protection for all data residing within the enclosure. HP Ultrium Tape Blades offer a complete data protection, disaster recovery and archiving solution for BladeSystem c-Class customers.

Each HP Ultrium Tape Blade solution ships standard with HP Data Protector Express Software Single Server Edition software. In addition, each tape blade supports HP One-Button Disaster Recovery (OBDR), which allows quick recovery of the operating system, applications and data from the latest full backup set. HP Ultrium Tape Blades are the industry's first tape blades and are developed exclusively for HP BladeSystem c-Class enclosures.



HP StorageWorks Ultrium Tape Blades

What's New

- Increased capacity and performance with the SB1760c, with capacity up to 1.6 TB on a single data cartridge (2:1 compression) and performance up to 576 GB/hr (2:1 compression).
- Enhanced security with AES 256-bit hardware data encryption capability providing additional safeguards for data stored on tape cartridges.

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At A Glance

- **Integrated into BladeSystem c-Class enclosures:**
 - Ideal direct attach tape-based data protection solution for customers who need an integrated data protection solution.
- **Complete data protection and disaster recovery solution:**
 - Ships standard with HP Data Protector Express Single Server Edition software ideal for data protection needs.
 - Supports One-Button Disaster Recovery (OBDR) for adjacent backup server. OBDR allows quick recovery of operating system, applications and data from the latest backup set in the event of a hard drive failure.
- **Versatility:**
 - Direct attach data protection of adjacent server and network backup of data via Ethernet for all other servers within the BladeSystem c-Class enclosure.
 - Protects both half-height and full-height server blades.
- **Hardware Data Encryption:**
 - SB1760c Tape Blade offers AES 256-bit hardware data encryption.
- **Form Factor:**
 - Half-height blade optimizing slot utilization.
- **Warranty:**
 - Hewlett-Packard provides a 3-year, next-day, parts exchange, limited warranty for the HP StorageWorks tape blades, plus 9x5 phone support for the duration of the warranty

Models

HP StorageWorks SB1760c Tape Blade AQ697A

NOTE: 0D1 will appear after this part number on your sales order if factory integration is indicated.

HP StorageWorks SB920c Tape Blade AJ401A

NOTE: 0D1 will appear after this part number on your sales order if factory integration is indicated.

HP StorageWorks Ultrium 448c Tape Blade 440947-B21

NOTE: 0D1 will appear after this part number on your sales order if factory integration is indicated.

Kit Contents SB1760c Tape Blade

- HP SB1760c Tape Blade
- HP LTO-4 Ultrium 1.6 TB Data Cartridge
- StorageWorks CD
- Data Protector Express Single Server Edition software CD
- Coupler
- Install poster
- Warranty booklet

Kit Contents SB920c Tape Blade

- HP SB920c Tape Blade
- HP LTO-3 Ultrium 800GB Data Cartridge
- StorageWorks CD
- Data Protector Express Single Server Edition software CD
- Coupler
- Install poster
- Warranty booklet

Kit Contents Ultrium 448c Tape Blade

- HP Ultrium 448c Tape Blade
- HP LTO-2 Ultrium 400GB Data Cartridge
- StorageWorks CD
- Data Protector Express Single Server Edition software CD
- Coupler
- Install poster



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- Warranty booklet

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Compatibility

Key Features: SB1760c Tape Blade

Features of the HP SB1760c Tape Blade include:

- LTO-4 Ultrium tape technology with 1.6 TB of capacity on a single data cartridge (2:1 compression) and performance up to 576 GB/hr (2:1 compression)
- AES 256-Bit hardware data encryption provides easy-to-enable security to protect the most sensitive data and prevent unauthorized access of tape cartridges.
- WORM (Write-Once, Read Many) support offering a simple and secure method for archiving records as part of a compliance solution to meet the toughest of industry regulations.
- Ship standard with HP Data Protector Express Single Server Edition software and supports HP's One-Button Disaster Recovery (OBDR)
- Integrated data protection solution for BladeSystem c-Class enclosures

Key Features: SB920c Tape Blade

Features of the HP SB920c Tape Blade include:

- LTO-3 Ultrium tape technology with 800 GB of capacity on a single data cartridge (2:1 compression) and performance up to 432 GB/hr (2:1 compression)
- WORM (Write-Once, Read Many) support offering a simple and secure method for archiving records as part of a compliance solution to meet the toughest of industry regulations.
- Integrated data protection solution for BladeSystem c-Class enclosures
- Ships standard with HP Data Protector Express Single Server Edition software and supports HP's One-Button Disaster Recovery (OBDR)

Key Features: Ultrium 448c Tape Blade

Features of the HP Ultrium 448c Tape Blade include:

- LTO-2 Ultrium tape technology with 400 GB of capacity on a single data cartridge (2:1 compression) and performance up to 173 GB/hr (2:1 compression)
- Integrated data protection solution for BladeSystem c-Class enclosures
- Ships standard with HP Data Protector Express Single Server Edition software and supports HP's One-Button Disaster Recovery (OBDR)

Direct Attach Data Protection

Provides direct attach tape-based data protection of the adjacent server blade within the enclosure.

Network Backup Capability

In addition to direct attach data protection of the adjacent server blade, the HP StorageWorks Ultrium Tape Blades also provide network backup capability for other data residing within the blade enclosure. The adjacent server to the tape blade becomes the designated backup server and other server blades within the enclosure can perform network backups via the Ethernet connection within the enclosure. This functionality is enabled by purchasing additional data protection software client licenses for each server blade that needs network backup capability.

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HP StorageWorks Ultrium Tape Blades

Compatibility

Complete data protection and disaster recovery solution The HP StorageWorks Ultrium Tape Blades ship standard with HP Data Protector Express Single Server Edition software. In addition, the tape blade supports HP's One-Button Disaster Recovery (OBDR) disaster recovery solution. OBDR allows quick restores of your operating system, applications and data from you latest full backup set. OBDR is supported for the server blade adjacent to the tape blade. For more information on HP Data Protector Express Single Server Edition software, please visit: www.hp.com/go/dataprotectorexpress. For more information on HP's One-Button Disaster Recovery, please visit: www.hp.com/go/obdr.

AES 256-Bit Hardware Data Encryption (SB1760c) The HP StorageWorks SB1760c Tape Blade offers AES 256-bit hardware data encryption. AES 256-bit hardware data encryption provides easy-to-enable security to protect the most sensitive data and prevent unauthorized access of tape cartridges. By using LTO-4 encryption, not only is data fully capable of being compressed therefore maximizing capacity, encrypted backups are completed without a loss in performance.

WORM (Write-Once, Read-Many) Support (SB1760c and SB920c) Critical to the success of data retention policies in highly regulated environments is the ability to store and manage data in an unalterable state. Following stringent guidelines set forth by regulatory agencies such as the SEC and HIPPA, IT organizations must now integrate new solutions and policies that can verify the integrity of stored data for periods that can extend well beyond seven years.

The HP SB1760c and SB920c Tape Blades feature the ability to archive and store data in a non-rewriteable format that meets the most stringent regulatory guidelines. Using a combination of integrated fail-safe features in the drive firmware, cartridge memory, and tape formatting, the SB1760c and SB920c can archive large amounts of data for periods of up to 30 years in a secure, untampered state. Since all SB1760c and SB920c Tape Blades include support for both rewritable and WORM media, IT organizations can now easily integrate a secure, long-term archiving solution into their current data protection strategy:

- A single drive to support all backup and archiving needs
- Two distinctive tape cartridges to easily distinguish and manage both rewriteable and WORM data cartridges
- A specially designed WORM data cartridge with multiple integrated fail-safe features to prevent accidental or intentional overwriting of data
- High-capacity, low-cost HP WORM media that can store up to 1.6 TB (SB1760c) or 800 GB (SB920c) of data on a single data cartridge
- Support from many backup and archiving software vendors, providing the most comprehensive and mainstream support in the industry
- The LTO open standard that offers greater choice and compatibility across all third-generation Ultrium products

Density The HP StorageWorks Ultrium Tape Blades fit into a half height bay on the BladeSystem c-Class c3000 and c7000 enclosures.

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Compatibility

Manageability

- Onboard Administrator module which provides a single point of control for intelligent management of the entire enclosure.
- Insight Display powered by the Onboard Administrator provides local management through an LCD display conveniently sited on the front of the system.
- HP StorageWorks Library and Tape Tools provide a robust diagnostic tool for Ultrium Tape Blades.

Compatibility and Integration Testing

Extensive compatibility testing with HP BladeSystem c-Class server blades for the highest level of integration available in the industry. Please visit <http://www.hp.com/go/connect> for a complete list of qualified tape blade solutions.

BladeSystem c-Class compatibility

Installs into half-height bay of a BladeSystem c-Class enclosure. Compatible with the following BladeSystem c-Class server blades:

HP ProLiant Server Blades

- ProLiant BL260c G5 Server Blade
- ProLiant BL460c Server Blade
- ProLiant BL460c G5 Server Blade
- ProLiant BL465c Server Blade
- ProLiant BL465c G5 Server Blade
- ProLiant BL480c Server Blade
- ProLiant BL495c G5 Server Blade
- ProLiant BL680c G5 Server Blade
- ProLiant BL685c Server Blade
- ProLiant BL685c G5 Server Blade

HP Integrity Server Blades

- HP Integrity BL860c Server Blade

NOTE: For the most up-to-date BladeSystem c-Class compatibility, please visit: <http://www.hp.com/go/connect>.

Operating Systems

- Microsoft Windows Server 2003
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- OpenVMS (Integrity Server Blades)
- HP-UX (Integrity Server Blades)

NOTE: For the most up-to-date list of compatible operating systems, please visit <http://www.hp.com/go/connect>.

NOTE: For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix: <http://h18004.www1.hp.com/products/servers/linux/hplinuxcert.html>



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Compatibility

Software Suite

HP Data Protector Express Single Server Edition software

- Simple data protection that installs from box to backup in minutes
- Fast and robust disaster recovery using One-Button Disaster Recovery (OBDR)

HP Systems Insight Manager (SIM)

- Powerful server and server options/storage manager tool
- Monitors over 1,200 system wide parameters
- Configuration/Diagnostic Utilities

HP StorageWorks Library and Tape Tools

- Robust diagnostic tool for HP tape products
- Free download plus quick installation
- Intuitive user interface requires no training
- Web-based smart firmware downloads, updates and notifications

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Warranty Information , HP Care Pack, and Service and Support

Warranty and Services Included with the Product Hewlett-Packard provides a 3-year, next-day, parts exchange, limited warranty for the HP StorageWorks tape blades, plus 9x5 phone support for the duration of the warranty.

For more information about HP's Global Limited Warranty and Technical Support, visit:
ftp://ftp.compaq.com/pub/products/storageworks/warranty/EN_321708-008.pdf

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.

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/>.

NOTE: Both the HP Proactive 24 Service and the HP Critical Service only relate to "reactive elements", "proactive elements", are available on time & materials basis (SW is supported separately per package).

NOTE: 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

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Warranty Information , HP Care Pack, and Service and Support

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.html>

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 products, 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/>

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Related Options

NOTE: Some of the options listed below may be discontinued.

Media	HP LTO-4 Ultrium 1.6 TB RW Data Cartridge	C7974A
	HP LTO-4 Ultrium 1.6 TB WORM Data Cartridge	C7974W
	HP LTO-3 Ultrium 800 GB RW Data Cartridge	C7973A
	HP LTO-3 Ultrium 800 GB WORM Data Cartridge	C7973W
	HP LTO-2 Ultrium 400 GB Data Cartridge	C7972A
	HP Ultrium Universal Cleaning Cartridge	C7978A
Mezzanine Pass-Thru Card	HP PCI Express Mezzanine Pass-Thru Card for BladeSystem c-Class NOTE: Required when installing an HP Ultrium Tape Blade adjacent to a full-height server blade.	431643-B21
HP Data Protector Express Software	HP Data Protector Express 4.0 SP1 Backup Server upgrade from Data Protector Express Single Server Edition Media & LTU NOTE: Required upgrade when configuring the tape blade to operate in a network backup environment. Recommended SKU for upgrading from HP Data Protector Express Single Server Edition to HP Data Protector Express.	BB117BT
	HP Data Protector Express 4.0 SP1 Network Server Agent LTU NOTE: Required for each server blade backing up over the network to the tape blade.	BB121BA
	HP Data Protector Express 4.0 Network Server Agent 3 Pack NOTE: Required for each server blade backing up over the network to the tape blade.	BB122BA
	HP Data Protector Express 4.0 Application Online Agent NOTE: Required for online backup of Microsoft SQL Server or Microsoft Exchange. One agent per machine and required for each application.	BB125BA

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Enclosure Configuration

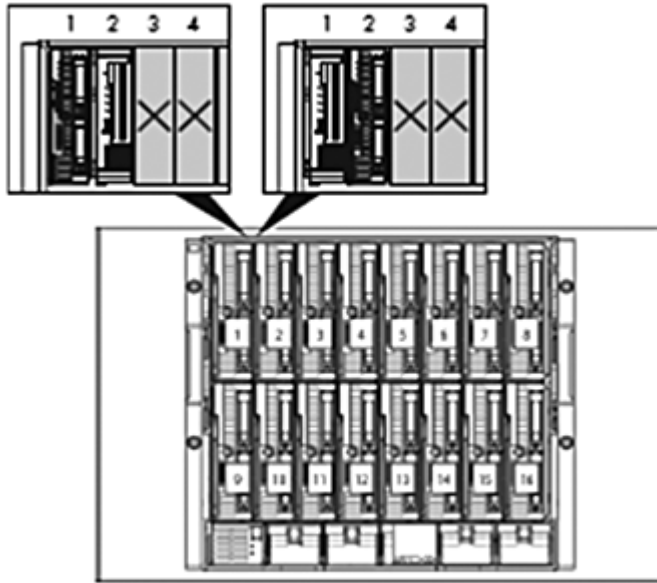


Figure 1 Installing a tape blade adjacent to a half-height server blade in a c7000 enclosure.

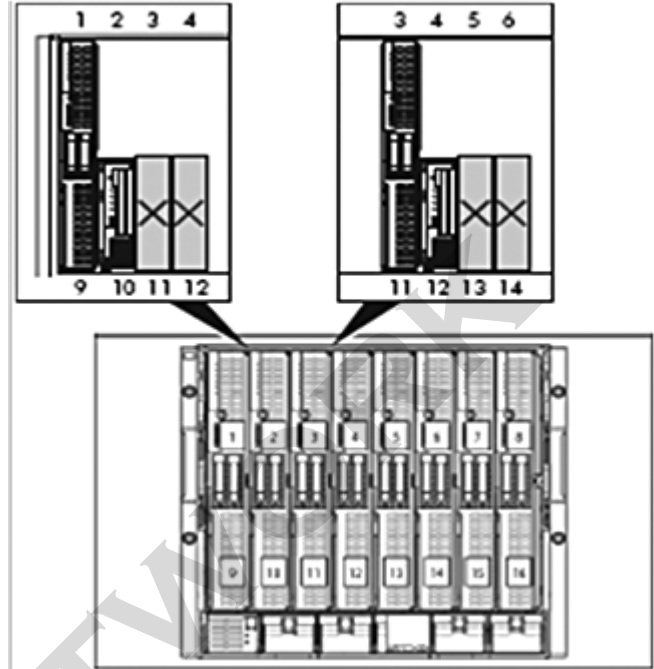


Figure 2 Installing a tape blade adjacent to a full-height server blade in a c7000 enclosure.

HP StorageWorks Ultrium Tape Blades

Description	Quantity Supported	Position Supported	Comments
HP Ultrium Tape Blade NOTE: Connected adjacent to a half-height server blade (Figure 1)	Up to 8 per HP BladeSystem c-Class c7000 Enclosure	Odd or Even slots next to partner server blade	<ul style="list-style-type: none"> A tape blade supports one partner server blade, and one partner server blade supports one tape blade. Identify the partner server blade to be installed with the HP tape blade. The two blades always occupy a pair of slots, as follows: 1 & 2, 3 & 4, 5 & 6, 7 & 8, 9 & 10, 11 & 12, 13 & 14, 15 & 16 (see Figure 1). If the partner server blade is installed in an odd-numbered bay, the HP tape blade is installed in the adjacent even-numbered bay to the right. If the partner server blade is installed in an even-numbered bay, the HP tape blade is installed in the adjacent odd-numbered bay to the left.
HP Ultrium Tape Blade NOTE: Connected adjacent to a full-height server blade (Figure 2)	Up to 4 per HP BladeSystem c-Class c7000 Enclosure	Odd or even slots next to partner server blade (lower bays only)	<ul style="list-style-type: none"> A tape blade supports one partner server blade, and one partner server blade supports one tape blade. When partnering a tape blade with a full height server blade, an HP PCI Express Mezzanine Pass-Thru Card for BladeSystem c-Class (431643-B21) is required. This card is installed in mezzanine 3 connector in the server blade. Identify the partner server blade to be installed with the HP tape blade. The two blades always occupy a pair of slots, as



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HP StorageWorks Ultrium Tape Blades

Enclosure Configuration

- follows: 9 & 10, 11 & 12, 13 & 14, 15 & 16 (see Figure 2).
- If the partner server blade is installed in an odd-numbered bay, the tape blade is installed in the adjacent even-numbered bay to the right.
 - If the partner server blade is installed in an even-numbered bay, the tape blade is installed in the adjacent odd-numbered bay to the left.
 - The tape blade is always located on the lower row of the enclosure when installed next to a full-height server blade.

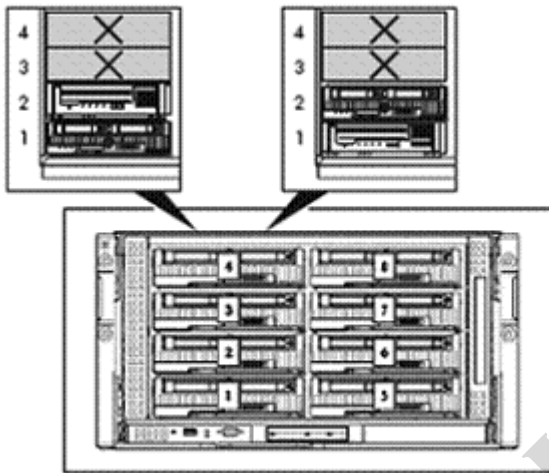


Figure 3 Installing a tape blade adjacent to a half-height server blade in a c3000 enclosure.

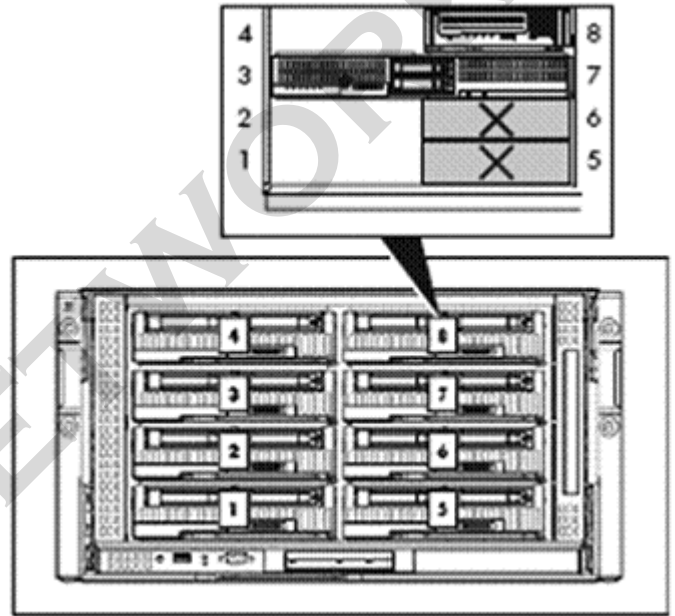


Figure 4 Installing a tape blade adjacent to a full-height server blade in a c3000 enclosure.

HP StorageWorks Ultrium Tape Blades

Description	Quantity Supported	Position Supported	Comments
HP Ultrium Tape Blade NOTE: Connected adjacent to a half-height server blade (Figure 3)	Up to 4 per HP BladeSystem c-Class c3000 Enclosure	Odd or Even slots next to partner server blade	<ul style="list-style-type: none"> • A tape blade supports one partner server blade, and one partner server blade supports one tape blade. • Identify the partner server blade to be installed with the HP tape blade. The two blades always occupy a pair of slots, as follows: 1 & 2, 3 & 4, 5 & 6 and 7 & 8 (see Figure 3).
HP Ultrium Tape Blade NOTE: Connected adjacent to a full-height server blade (Figure 4)	1 per HP BladeSystem c-Class c3000 Enclosure	Paired with a server blade in slots 3 & 7 (tape blade goes in 8)	<ul style="list-style-type: none"> • A tape blade supports one partner server blade, and one partner server blade supports one tape blade. • When partnering a tape blade with a full height server blade, an HP PCI Express Mezzanine Pass-Thru Card for BladeSystem c-Class (431643-B21) is required. This card is installed in mezzanine 3 connector in the server blade. • Identify the partner server blade to be installed with the HP



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Enclosure Configuration

tape blade. The two blades always occupy a pair of slots, as follows: 3 & 7 (tape blade in 8).

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HP StorageWorks Ultrium Tape Blades

Technical Specifications

Tape Blade	HP StorageWorks SB1760c Tape Blade		
Dimensions (HxWxD)	2.19 x 7.154 x 20.058 in (5.56 x 18.17 x 50.95 cm)		
Weight (loaded)	11 lb (4.99 kg)		
Capacity	Native	800 GB	
	Compressed	1.6 TB	
	(assumes 2:1 data compression)		
Performance	Buffer Size	128 MB	
	Sustained transfer rate, native	80 MB/s	
	Sustained transfer rate, compressed	160 MB/s (576 GB/hr)	
	(assumes 2:1 data compression)		
	Burst transfer rate	300 MB/s (with 3Gb/sec SAS)	
	Data rate matching range	33-80 MB/s (native)	
	Data access time (from BOT)	64 s typical for a 800 GB tape (native)	
	Average load time	17 s	
	Average unload time	16 s	
	Rewind time from EOT	121 s (200 GB tape)	
	Rewind tape speed	5.0 m/s	
	Reliability	MTBF	250,000 hours at 100% duty cycle
Uncorrected Error Rate		1x10 ¹⁷	
Media Compatibility	LTO-4 Ultrium(Read and Write)		
	LTO-3 Ultrium - (Read and Write)		
	LTO-2 Ultrium(Read Only)		
Tape Format	Recording method	16-channel linear serpentine	
	Recording format	LTO-4 Ultrium LTO-3 Ultrium(for 400 GB tape)	
	Data compression	LTO DC dual mode compression (an enhanced version of ALDC)	
	Error detection/correction	Reed-Solomon	
	Read channel technology	Partial Response Maximum Likelihood (PRML)	
	Data encoding method	RLL 0,13/11	
Interface	Interface type	3Gb/sec SAS	
Power Specifications	Power requirements	+5V@2.5A (typical)	
		+5V@2.5A (max)	
		+12V@0.7A (typical)	
		+12V@2.1A (max)	
	Power consumption	13 Watts idle	
		20 Watts typical	
		33 Watts max	
Environmental Specifications	Temperature range	Operating	50° F to 95° F (10° C to 40° C) at a minimum of 6CFM airflow



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Technical Specifications

	Storage	-40° F to 151° F (-40° C to 66° C)
Non-condensing humidity range	Operating	20 to 80% RH (non-condensing)
Non-condensing humidity range	Storage	10 to 95% RH (non-condensing)

NOTE: To maintain proper cooling and airflow, a blank or blade must occupy all bays during operation.

Standards Compliance	CSA Certification to C22.2, No.60950 (cCSAus)
	TÜV EN60950 (IEC 60950)
	CE Declaration of Conformity
	FCC 47 CFR Parts 15
	NOM
	VCCI
	C-TICK
	RRL
	BSMI
	GOSH
CB Certificate and Report (IEC 60950)	

Tape Blade	HP StorageWorks SB920c Tape Blade	
Dimensions (HxWxD)	2.19 x 7.154 x 20.058 in (5.56 x 18.17 x 50.95 cm)	
Weight (loaded)	11 lb (4.99 kg)	
Capacity	Native	400 GB
	Compressed (assumes 2:1 data compression)	800 GB
	Buffer Size	64 MB
Performance	Sustained transfer rate, native	60 MB/s
	Sustained transfer rate, compressed (assumes 2:1 data compression)	120 MB/s (432 GB/hr)
	Burst transfer rate	300 MB/s (with 3Gb/sec SAS)
	Data rate matching range	20-60 MB/s (native)
	Data access time (from BOT)	64 s typical for a 200 GB tape (native)
	Average load time	17 s
	Average unload time	16 s
	Rewind time from EOT	121 s (200 GB tape)
	Rewind tape speed	5.0 m/s
	Reliability	MTBF
Uncorrected Error Rate		1x10 ¹⁷



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Media Compatibility	LTO-3 Ultrium (Read and Write) LTO-2 Ultrium (Read and Write) LTO-1 Ultrium (Read Only)	
Tape Format	Recording method	16-channel linear serpentine
	Recording format	LTO-3 Ultrium LTO-2 Ultrium (for 200 GB tape)
	Data compression	LTO DC dual mode compression (an enhanced version of ALDC)
	Error detection/correction	Reed-Solomon
	Read channel technology	Partial Response Maximum Likelihood (PRML)
	Data encoding method	RLL 0,13/11
Interface	Interface type	3Gb/sec SAS
Power Specifications	Power requirements	+5V@2.5A (typical) +5V@2.5A (max) +12V@0.7A (typical) +12V@2.1A (max)
	Power consumption	13 Watts idle 20 Watts typical 33 Watts max
Environmental Specifications	Temperature range	Operating 50° F to 95° F (10° C to 40° C) at a minimum of 6CFM airflow Storage -40° F to 151° F (-40° C to 66° C)
	Non-condensing humidity range	Operating 20 to 80% RH (non-condensing)
	Non-condensing humidity range	Storage 10 to 95% RH (non-condensing)
	NOTE: To maintain proper cooling and airflow, a blank or blade must occupy all bays during operation.	
Standards Compliance	CSA Certification to C22.2, No.60950 (cCSAus) TÜV EN60950 (IEC 60950) CE Declaration of Conformity FCC 47 CFR Parts 15 NOM VCCI C-TICK RRL BSMI GOSH CB Certificate and Report (IEC 60950)	

Tape Blade	HP StorageWorks Ultrium 448c Tape Blade
Dimensions (HxWxD)	2.19 x 7.154 x 20.058 in (5.56 x 18.17 x 50.95 cm)
Weight (loaded)	11 lb (4.99 kg)



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Capacity	Native	200 GB	
	Compressed (assumes 2:1 data compression)	400 GB	
	Buffer Size	64 MB	
Performance	Sustained transfer rate, native	24 MB/s	
	Sustained transfer rate, compressed (assumes 2:1 data compression)	48 MB/s (173 Gb/hr)	
	Burst transfer rate	300 MB/s (with 3Gb/sec SAS)	
	Data rate matching range	0-24 MB/s (native)	
	Data access time (from BOT)	64 s typical for a 200 GB tape (native)	
	Average load time	17 s	
	Average unload time	16 s	
	Rewind time from EOT	121 s (200 GB tape)	
	Rewind tape speed	5.0 m/s	
	Reliability	MTBF	250,000 hours at 100% duty cycle
Uncorrected Error Rate		1x10 ¹⁷	
Media Compatibility	LTO-2 Ultrium (Read and Write)		
	LTO-1 Ultrium (Read and Write)		
Tape Format	Recording method	8-channel linear serpentine	
	Recording format	LTO-2 Ultrium LTO-1 Ultrium (for 100 GB tape)	
	Data compression	LTO DC dual mode compression (an enhanced version of ALDC)	
	Error detection/correction	Reed-Solomon	
	Read channel technology	Partial Response Maximum Likelihood (PRML)	
	Data encoding method	RLL 0,13/11	
	Interface	Interface type	3Gb/sec SAS
Power Specifications	Power requirements	+5V@2.5A (typical)	
		+5V@2.5A (max)	
		+12V@0.7A (typical) +12V@2.1A (max)	
	Power consumption	13 Watts idle	
		20 Watts typical	
		33 Watts max	
Environmental Specifications	Temperature range	Operating	50° F to 95° F (10° C to 40° C) at a minimum of 6CFM airflow
		Storage	-40° F to 151° F (-40° C to 66° C)
	Non-condensing humidity range	Operating	20 to 80% RH (non-condensing)
		Storage	10 to 95% RH (non-condensing)



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HP StorageWorks Ultrium Tape Blades

Technical Specifications

NOTE: To maintain proper cooling and airflow, a blank or blade must occupy all bays during operation.

Standards Compliance	CSA Certification to C22.2, No.60950 (cCSAus) TÜV EN60950 (IEC 60950) CE Declaration of Conformity FCC 47 CFR Parts 15 NOM VCCI C-TICK RRL BSMI GOSH CB Certificate and Report (IEC 60950)
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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.

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