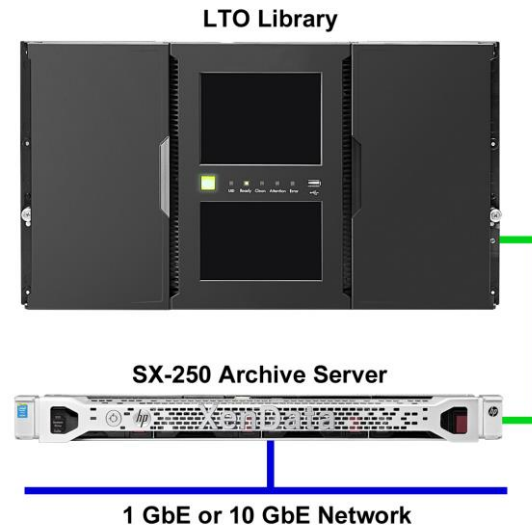




SXL-8200Q: Expandable LTO-8 Digital Archive

**360 TB to 2.76 PB
LTO-8 Archive System**

**managed by
XenData6 Server software**



Functionality

- 360 TB – 2.76 PB library capacity
- Manages Unlimited Offline LTO
- Highly Dependable LTO Technology
- Lowest Cost Data Storage per TB
- Standard File-Folder Interface
- CIFS/SMB and FTP Network Protocols
- Disk Cache for Exceptional Performance
- Writes to LTO in LTFS or TAR
- Replicates LTO Automatically
- End to End Verification
- Optimized File Restores
- Partial File Restore Support
- File and Folder Spanning
- Automatic LTO Generation Migration
- Supports Multiple LTO Groups
- Extensive Archive Reports
- E-mail Alerts and On-Screen Notifications
- Backed by Excellent Customer Support

Overview

The SXL-8200 system is a highly expandable digital archive that is optimized for video files. It includes a XenData SX-250 Archive Server and a Qualstar Q80 LTO library with one or two LTO-8 drives, 10 mail slots and from 30 to 230 active slots.

The SXL-8200 system is powered by a XenData SX-250 Archive Server which means files are archived to and restored from LTO just as files are transferred to and from a standard disk volume. The SX-250 manages the LTO library and connects to a 1 GbE or 10 GbE network. It may also be connected to a SAN via fibre channel.

The LTO archive system runs automatically, driven by administrator defined policies. It can automatically create duplicate LTO cartridges which may be exported from the tape library and retained in an offsite location, providing strong data protection for your digital assets.

Highly Expandable

The Qualstar LTO library in the base system is a 6RU rack mount unit. It has 80 physical slots of which 10 are mail slots that are used to import and export LTO cartridges. The base system has 30 activated slots and 40 unused slots which may be activated by purchase of slot upgrade licenses. Each upgrade license activates 20 additional slots.

The library may be further expanded by addition of one or two 6RU expansion modules which each add an additional 80 physical slots. These physical slots may be activated in 20 slot increments. When using 12 TB LTO cartridges, the 30 slots in the base system provide a library capacity of 360 TB. Each 20 slots expansion adds a further 240 TB of capacity and when the system is fully expanded the total number of slots is 230, providing a 2.76 PB capacity.

Great Compatibility

Files are presented in a standard file/folder structure which is typically shared over the network. This means that the archive appears like disk. Files are transferred to and from the archive locally or using either the standard Windows network protocol (CIFS/SMB) or FTP file transfers. In addition, an XML driven API is available which allows third party applications to move files to and from the archive and provide a tight integration.

These interface options mean that the system works with most applications used in video surveillance and creative video. Alternatively, video files may be archived and restored manually to a file-folder structure using Windows Explorer or FTP utilities

Functionality

Key Functionality and Benefits

Standard File Interface – The digital archive accepts all file types – from an MXF to a WORD document - and presents them in a single Windows file/folder structure. Files are written to and retrieved from the archive as though from a standard disk-based volume or network share. **Benefit:** works with most applications natively.

Disk Cache – The disk cache delivers high performance in a system that combines the access times of disk with all the dependability and cost-effectiveness of tape.

XML Interface – In addition to the file system interface, an XML driven API is available. The XML instructions include the ability to pull assets from and push assets to a specified location, the option to batch and prioritize jobs and obtain job status. **Benefit:** easily allows third party applications to move files to and from the archive and provides a tight integration with the application.

Standard Network Protocols – The solution is optimized for CIFS/SMB and FTP file transfers. Furthermore, it supports connectivity to a SAN. **Benefit:** works with the most common network protocols used in media and entertainment.

Manages Near-line Disk, Near-line & Offline Tape – The administrator defines policies for disk caching that can be tailored for different file types and folders. **Benefit:** Frequently accessed files may be retained on disk.

Supported Tape Formats – LTF5 and TAR. **Benefit:** avoids proprietary formats and vendor lock-in.

Self-Describing LTO Cartridges – Each LTO cartridge contains all the file system metadata necessary to recover all the files stored on it. **Benefit:** LTO cartridges easily transferred between archive systems.

LTO Cartridge Replication – The software automatically generates replica LTO cartridges that may be exported from the library for off-site retention. If a cartridge fails for any reason, a replacement is easily recreated.

End to End Verification – A read head that follows the write head in each LTO drive is used to verify the data just written. **Benefit:** this provides an automated check-sum operation for all data written to LTO.

Supports LTO Cartridge Spanning – The Administrator defined policies can be set to allow or prevent files being spanned across multiple LTO cartridges. Additionally, the transfers of multiple files and folders will be automatically spanned across multiple cartridges. **Benefit:** archive operations are not limited by the capacity of individual LTO cartridges unlike most basic LTF5 systems.

Dynamic Expansion of LTO Cartridge Groups – The system will dynamically expand LTO cartridge groups to meet capacity demands. **Benefit:** system runs automatically without need for administrator intervention.

Optimized Restores – The system restores a queue of files in the shortest possible time. The restore requests are processed in an order that minimizes unnecessary tape movement. **Benefit:** greatly decreases total restore time when restoring multiple small files.

File Version Control – The software provides comprehensive file version control. **Benefit:** deleted files and old file versions may be restored from LTO (unless the files have been purged using a repack operation).

Partial File Restore – With very large files there is often a need to read only a portion of the file. The XenData XML interface is available with partial file restore (PFR) based on timecodes. In addition, the XenData file system interface supports PFR based on byte offset.

Easy Migration from One Generation of LTO to Another – Repack function allows seamless migration from one LTO generation to another.

Metadata Backup and Restore – A file system metadata backup and restore utility is provided. **Benefit:** rapid system restore in case of rebuild after disk failure.

Alert Module – A software module is included which provides e-mail and on-screen alerts. These are tailored to the needs of archive system operators, system administrators and IT support personnel. **Benefit:** ideal for cartridge management and instant notification of any problems.

Cartridge Contents and Search Reports – The files contained on any cartridge, including offline cartridges, can be listed in a report. Additionally, search reports list all the files and their LTO cartridge barcode locations that match a user-defined search term. The reports may be exported to Excel for further analysis. **Benefit:** useful archive management tool.

Industry Standard File Security – The appliance runs Windows Server 2012 R2 Standard Edition and integrates fully with the Microsoft Windows security model based on Active Directory. **Benefit:** easy integration into an existing Windows environment.

Policy Driven File Management

Three Storage Levels

The system administrator defines policies that determine where files are physically stored on the digital archive. These policies support hierarchical storage management (HSM) and automatic tape cartridge replication. The Archive Server supports three main levels of storage hierarchy:

Online with one instance of a file on disk and, in addition, there will typically be one or more instances on LTO. In this case the file will be retrieved from disk when accessed.

Near-line with at least one instance of a file on an LTO cartridge within the library and no instance on disk. When a near-line file is accessed, the system automatically transfers the file from LTO.

Offline with no instance on disk and one or more instances of a file on LTO cartridges, all of which have been exported from the tape library. If there is an attempt to read an offline file, the system issues an email alert or an on-screen notification.

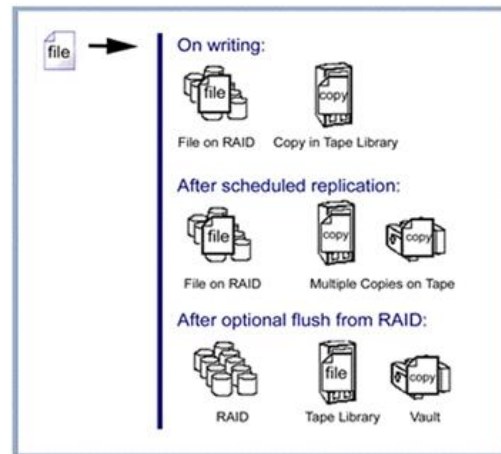
Data protection is achieved by automatically generating multiple instances of a file. The archive system can automatically produce copies of LTO cartridges which may be exported from the tape library and retained off-site.

Tailored Policies

An SXL-8200 system may have many different policies, tailored to the needs of the different file types and folder contents that are being archived. A typical XenData file management policy is illustrated in the diagram opposite. On writing a file, it is first written to disk. As soon as the file has been successfully written to disk, it is put into a queue to be written to a primary LTO cartridge. After completion of this operation, there are two instances of the file – one on disk and one on LTO. LTO cartridge replication is optional and may be set to occur at the same time as the primary is written or may be scheduled.

The administrator can configure the system such that after a file has been securely written to LTO, the instance stored on disk will be flushed (deleted and replaced by a sparse file, often called a stub file) to release the disk space that was occupied by the file. Files are available to users even if they have been flushed from disk and are only stored on LTO. Flushing from disk does not affect the location of a file within the file system or make it inaccessible in any other way; the only impact of flushing is to increase the time taken to read the file because it first has to be accessed on LTO. After a file has been flushed from disk, its off-line attribute bit is set and the file is still available from LTO within the library. The Microsoft off-line bit changes network timeout periods to allow retrieval of the file from storage types with long access times.

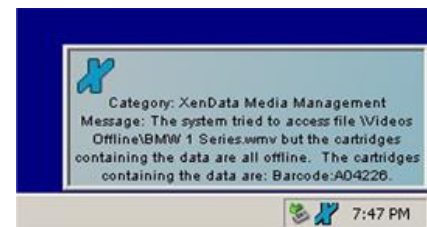
On reading from LTO, a file is automatically restored to disk as it is simultaneously transferred over the network. This use of caching for restores ensures that the LTO tape drives provide fast transfers even if the network connection becomes slow.



Offline File Management

The archive system manages an unlimited number of LTO cartridges that have been taken entirely offline. This means that the capacity of the archive effectively becomes unlimited. It also means that operator intervention is required to move LTO cartridges from the shelf to the library when there is a need to restore an offline file.

When a file is taken offline by exporting all the LTO cartridges that contain that file, it continues to be shown in the archive file/folder structure. However, this is not the complete file; it is a sparse file which has the same attributes as the complete file, such as reported size, modification date, etc. When an offline file is accessed by a program, a message is returned immediately that identifies that the file is not available. Also the XenData software puts a message in the Windows Event Log and optionally sends an e-mail and/or on-screen message that identifies which LTO cartridges contain the requested file. This notification allows the correct cartridge to be easily identified and then imported back into the LTO library. The file will then be automatically restored when the read request is retried.



Intelligent Cartridge Management

Importing and Exporting Cartridges

LTO cartridges may be bulk loaded and unloaded using the tape magazines or alternatively the mail slot may be used to import or export up to three cartridges at a time. The mail slot allows import and export of cartridges without taking the robotic library offline.

Intelligent Barcode Management

The LTO library includes a barcode reader which automatically scans all LTO cartridges and makes the barcode information available to the SX-250 Server. Barcodes are the ideal way to keep track of LTO cartridges in an archive: the barcode is readable by human operators and machine readable by the barcode reader in the library.

The XenData system automatically writes the barcode information to an in-cartridge memory chip within each LTO cartridge. This allows the barcode to be available even when the cartridge has been exported from the library and is being used within a stand-alone LTO drive which does not have a barcode reader.

One of the key features of a SXL-8200 system is LTO cartridge replication. The system can be configured to automatically create replica cartridges for data protection purposes. This capability is typically used to create replica cartridge pairs and after a pair of cartridges becomes full, one of the duplicate cartridges is exported from the library and stored in a secure offsite location. The XenData system will automatically pair A-B barcode sequences to tape replicas, making for easy management of the replica cartridges.

Cartridge Compatibility

Compatible with LTO-8 and LTO-7 Cartridges

The archive system is compatible with LTO-8 and LTO-7 cartridges, and provides capacities per cartridge from 6 TB to 12 TB:

- 12 TB** – write/read compatible with LTO-8 rewritable cartridges that have a native capacity of 12 TB.
- 9 TB** – write/read compatible with LTO-7 rewritable cartridges which have been formatted using the LTO-8 SXL-8200 system or another LTO-8 drive to provide 9 TB of native capacity.
- 6 TB** – write/read compatible with LTO-7 rewritable cartridges which have been formatted using an LTO-7 or LTO-8 drive to provide 6 TB of native capacity.

Quoted capacities are without compression. When using compressible files, the capacities typically increase by X 2.5 per cartridge.

In addition, the system is write/read compatible with WORM LTO-7 cartridges.

Note: 1 TB equals 1 x 10E12 bytes.

Writes using LTFS and TAR Formats

The archive system supports both LTFS (Linear Tape File System) and TAR (Tape ARchive) cartridge file system formats. These formats define how data is written to the tape: LTFS and TAR use different data structures for the file data and file system metadata that are written to tape. When configuring a group of LTO cartridges, the administrator selects either TAR or LTFS as the cartridge file system format. In either case, the file restored from the system is identical to the original archived file. For example, if an MXF file is written to the archive, the same MXF will be restored.

The choice of cartridge file system format is important when transferring cartridges from one system to another. The LTFS format was developed by IBM and announced in 2010. Since then, it has been widely adopted, making it an exchange standard which allows cartridges to be moved between systems created by different vendors.

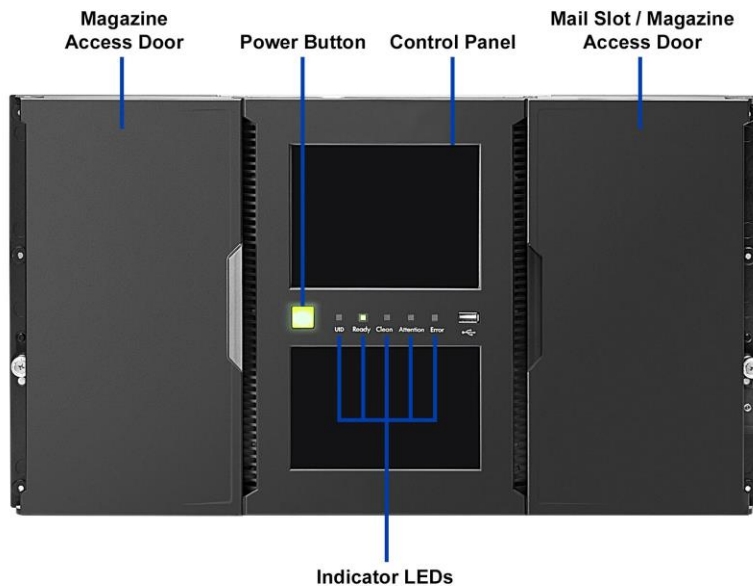
LTO Library

With a reliability rating of 2,000,000 load/unload cycles, SXL-8200 library provides the high dependability required by enterprise-class environment. In the base SXL-8200 models, the library takes 6 RU of rack space and includes 70 physical cartridge slots for operational use. Thirty of these slots are activated. By purchase of 20 slot upgrade licenses, the library can be easily expanded to 50 or 70 slots. When using LTO-8 cartridges, the 70 slot configuration provides a library capacity of 840 TB.

When more than 840 TB is required, one or two 6 RU expansion modules may be added. Each module provides a further 80 physical slots. With two fully activated expansion modules, the total library capacity is 230 slots which provides 2.76 PB when using LTO-8 cartridges.

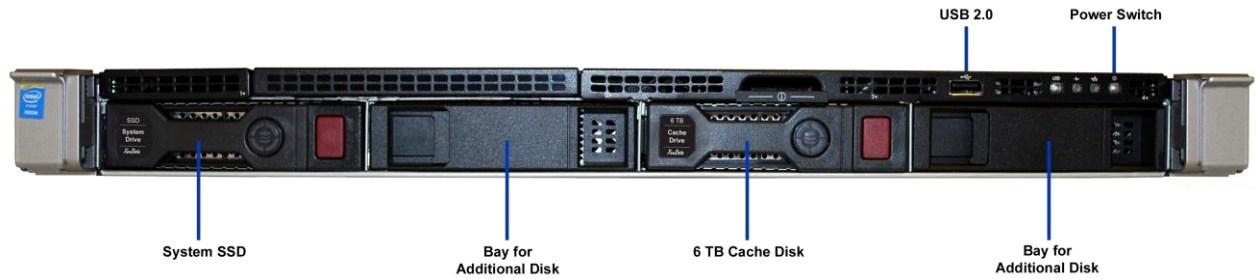


The library has 10 mail slots that provide easy import and export of individual LTO cartridges without interrupting library operations. They are accessed via the front of the library as illustrated below.

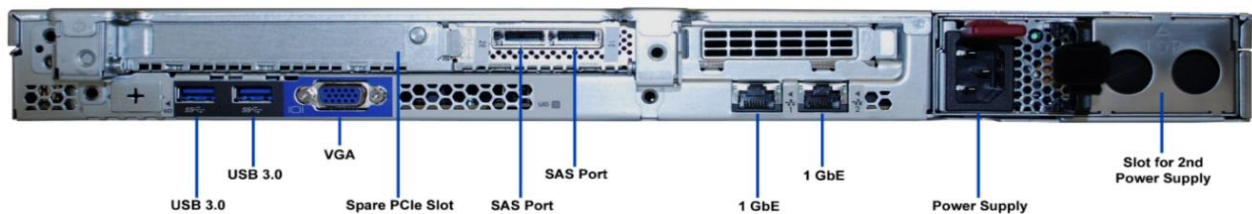


Server Front Panel and Connections

The front of the SX-250 includes a USB 2.0 connection, shown below:



Connections to the rear of the SX-250 archive server are shown below:



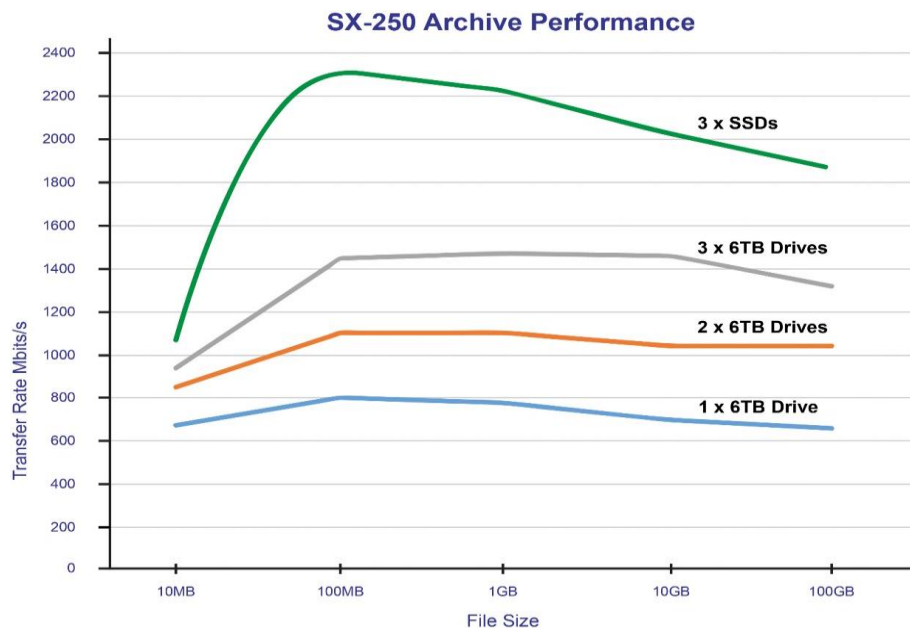
The two SAS ports connect directly to the LTO-8 drives in the library.

Performance

The SX-250 restores files at near to the maximum transfer rate supported by the LTO drive. In the case of LTO-8, the restore rate is close to 2,400 Mbits/s.

The archive rate depends on the file size and the disk cache configuration. The graph below shows the sustainable transfer rate for file sizes in the range from 10MB to 100GB when writing to an LTO-8 drive with an LTO-8 cartridge. Upgrading the number of drives in the cache configuration increases the archive performance as well as increasing the cache capacities. For the highest performance, the disk cache may be upgraded to SSD RAID.

For applications requiring high transfer rates for archive operations, we recommend upgrading the disk cache to either SSDs (SKU: 222071) or three 6TB drives in a striped configuration (SKU: 222059).



Specifications

LTO Tape Library

LTO Drives	
LTO drive type:	IBM LTO-8 half-height
Drive interface:	SFF-8088 6 Gb/s SAS (2m cables for connection to SX-250 server are included)
Transfer rate - writing and reading:	300 MBytes/s native per drive
Base Model Library	
Library type:	Qualstar Q80
Number of LTO drives:	1 or 2
Total slots – including mail slots:	80
Licensed Near-Line LTO Capacity:	360 TB (30 slots) – up to an additional 40 slots may be licensed
Mail slots – as shipped:	10
Mail slots - maximum	10
Barcode Reader:	Included
Configuration interfaces:	Touchscreen front panel and web interface
Interface to Medium Changer:	ADI
Mean Swaps Between Failures:	>2 million robot load/unload cycles
Power Requirements	
Number of Power Supplies:	2
Voltage:	100 – 240 V
Frequency:	50 – 60 Hz
Power (peak):	350 W
Dimensions / Weight	
19 Inch Rack Form Factor:	6RU
Width:	18.7 inches (475 mm)
Depth:	35.1 inches (892 mm)
Weight (including 2 LTO drives):	90 lbs (41 Kg)
Rack rails:	Included
Optional Expansion Module	
Max number of expansion modules	2
Number of LTO drives:	0
Total slots per module	80 slots
Licensed Near-Line LTO Capacity:	0 TB (0 slots) – slots must be licensed
Mail slots:	None
Power Requirements	
Number of Power Supplies:	2
Voltage:	100 – 240 V
Frequency:	50 – 60 Hz
Power (peak):	350 W
Dimensions / Weight	
19 Inch Rack Form Factor:	6RU
Width:	18.94 inches (481 mm)
Depth:	36.42 inches (925 mm)
Weight:	70 lbs (32 Kg)
Rack Rails:	Included

Specifications

SX-250 Archive Server

Archive management software:	XenData6 Server
Notification software:	XenData Alert Module
Operating system:	Microsoft Windows Server 2012 R2 Standard Edition
Processor:	Intel® Xeon® 6-core processor
RAM:	32 GB
System disk:	240 GB SSD
Cache disk in base models:	6 TB SAS 7,200 rpm
Network connections:	2 x RJ45 connectors; 1000BASE-T, 100-BASE-TX, 10BASE-T
USB connections:	2 x USB 3.0 (rear mounted); 1 x USB 2.0 (front mounted)
Connections to library:	2 x SFF-8088 connectors; 6 Gb/s SAS
Number of power supplies:	2
Power:	100-240V; 50-60 Hz; 6.2-4.1 Amp max
Operation temperature:	50-95°F (10-35°C)
Operation humidity:	8-90% non-condensing
Form factor:	1U, 23.9" deep
Dimensions (HxWxD):	1.7" x 17.1" x 23.9" (42.9mm x 434.6mm x 607.6mm)
Weight:	25.4 lbs (11.5 Kg)
Rack Rails:	Included

SXL-8200 Base Models

XenData SKU	Description
229023	Model SXL-8200Q-30-1xLTO8. Complete LTO-8 archive system with 360 TB near-line LTO and unlimited offline capacity. Consists of XenData SX-250 Archive Server, Qualstar Q80 6RU library with one LTO-8 drive, 10 mail slots and 30 active licensed slots. The library has an additional 40 slots that may be activated by purchase of license upgrades.
229024	Model SXL-8200Q-30-2xLTO8. Complete LTO-8 archive system with 360 TB near-line LTO and unlimited offline capacity. Consists of XenData SX-250 Archive Server, Qualstar Q80 6RU library with two LTO-8 drives, 10 mail slots and 30 active licensed slots. The library has an additional 40 slots that may be activated by purchase of license upgrades.

SXL-8200 Options

XenData SKU	Description
	Capacity Upgrades
XAS-UPG-SXL8200-20LM	Slot license upgrade to activate an additional 20 slots.
229025	6RU LTO library expansion with 80 physical slots and two power supplies. Slots must be activated by purchase of slot license upgrades.
	Connectivity Options
101048	Dual port 10 GbE network adapter HP 560SFP+ pre-installed in SX-250. This adds two 10 GbE ports to the SX-250 and uses the spare PCIe slot. Transceivers not included.
101057	SFP+ 10 Gb/s LC Short Range Transceiver for insertion in SKU 101048. HP part number J9150A. Quantity 2 required to use both 10 GbE ports in the adapter.
107130	Dual port 10 GbE network adapter for use with standard CAT6 or UTP cabling pre-installed in SX-250. It is an HP model 561T adapter and uses the spare PCIe slot.
101023	Fibre Channel adapter pre-installed in SX-250 for FC SAN connectivity. Provides two 8 Gb/s FC ports with LC type connectors. Uses the spare PCIe slot.
	Redundancy Option
222050	Disk Redundancy Upgrade. Includes an additional 6 TB cache disk and system SSD which are pre-installed and configured as mirror disks.
	Performance Options
222056	SX-250 Disk Cache Upgrade. Includes an additional 6TB cache disk pre-installed and configured in RAID 0 (striped), taking the cache capacity to 12 TB.
222057	SX-250 Disk Cache Upgrade. Includes two additional 6TB cache disks pre-installed and configured in RAID 0 (striped), taking the cache capacity to 18 TB.
222071	SX-250 Disk Cache Upgrade. Includes three high endurance 800 GB SSDs pre-installed and configured in RAID 0 (striped), providing a cache capacity to 2.4 TB.
222051	32 GB of additional RAM pre-installed in the SX-250, taking the total RAM capacity to 64 GB. Upgrading the RAM is useful when additional applications are running on the SX-250.

Additional Information

For further information, please contact XenData.

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