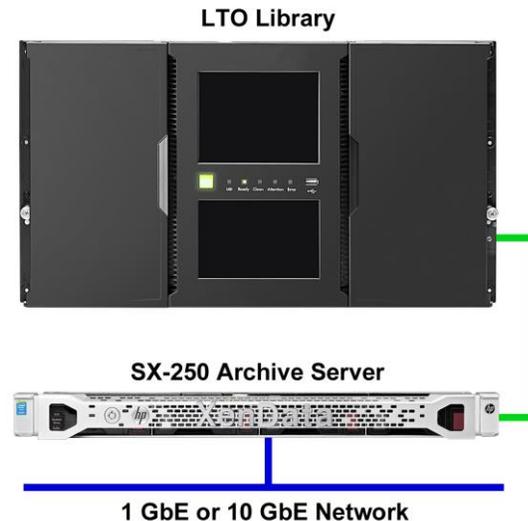




# SXL-8200: Expandable LTO Digital Video Archive

**180 TB to 900 TB  
LTO-7 Archive System**

**managed by  
XenData6 Server software**



## Functionality

- 180 TB LTO Base System Capacity
- Expands to 900 TB LTO Capacity
- Unlimited Offline LTO capacity
- Standard File-Folder Interface
- Object Storage Interface
- Writes to LTO in LTFS or TAR
- CIFS/SMB and FTP Network Protocols
- Windows and Mac Compatibility
- Automatic LTO Tape Replication
- 2.4 TB – 18 TB Disk
- End to End Verification
- Optimized File Restores
- Supports Partial File Restores
- File and Folder Spanning
- Repack of LTO Tape Cartridges
- Supports Multiple LTO Groups
- Cartridge and File Search Reports
- E-mail Alerts, On-Screen Notifications

## 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 robotic LTO library with one or two LTO-7 drives, 10 mail slots and from 30 to 150 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 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 a 6RU expansion module which adds an additional 80 physical slots. These physical slots may be activated in 20 slot increments.

When using 6 TB LTO cartridges, the 30 slots in the base system provide a library capacity of 180 TB. Each 20 slot expansion adds a further 120 TB of capacity and when the system is fully expanded the total number of slots is 150, providing a 900 TB 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, the system provides an object storage interface using an XML API.

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 File 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.

**Object Storage Interface** – In addition to the file system interface, an XML interface is provided. 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 directly control and monitor the archive system.

**Windows and Mac Compatibility** – Windows and Mac OS X clients are natively supported. **Benefit:** no need to load software on client computers.

**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 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** – LTFS 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. **Benefit:** provides strong data protection.

**End to End Verification** – A read head that follows the write head 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 LTFS 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. For example, this frequently occurs with multi-gigabyte video files when a short clip is requested. The XenData object storage interface is available with partial file restore (PFR) based on timecodes. In addition, the XenData file system interface supports PFR based on byte offset which when combined with applications such as a Dalet media asset management system provide a timecode based PFR solution. **Benefit:** reduces time to restore short clips.

**Repack of LTO Cartridges** – This copies only current files, excluding deleted files and old versions of files, to new LTO cartridges. **Benefit:** permits recovery of capacity from rewritable LTO cartridges.

**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 Essentials 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 over the network.

**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 over the network, the system automatically transfers the file from LTO to disk cache. As soon as the file transfer to disk commences, the file transfer over the network also starts.

**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.

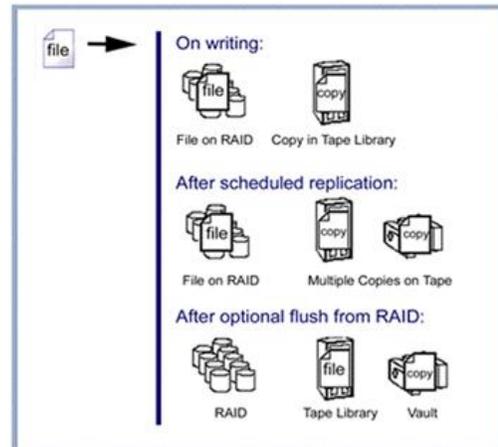
Data protection is achieved by automatically generating multiple instances of a file. The archive system can automatically produce copies of LTO cartridges which may be exported from the tape library and retained off-site.

## 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.

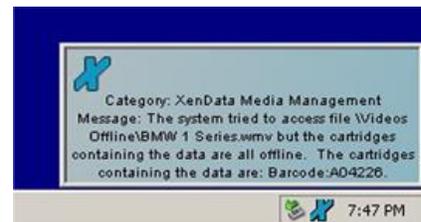
On reading from LTO, a file is automatically restored to disk as it is simultaneously transferred over the network. This use of caching for restores ensures that the LTO tape drives provide fast transfers even if the network connection becomes slow.



## 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

### LTFS and TAR

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-7 and LTO-6

The archive system is compatible with the following LTO cartridges:

- LTO-7** – 6 TB rewritable cartridges which may be written in either LTFS or TAR
- LTO-6** – 2.5 TB rewritable cartridges which may be written in either LTFS or TAR

In addition, the system is write/read compatible with WORM LTO-7 and LTO-6 cartridges and will read LTO-5 cartridges written in LTFS or on a XenData system using the TAR format.



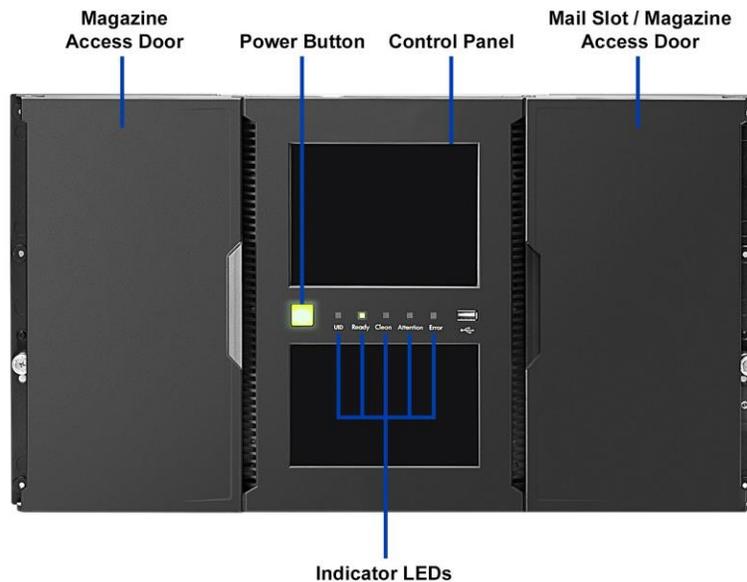
## LTO Library

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-7 cartridges, the 70 slot configuration provides a library capacity of 420 TB.

When more than 420 TB is required, a 6 RU expansion module may be added to provide a further 80 physical slots. When all of these are activated, the total library capacity is 150 slots which provides 900 TB when using LTO-7 cartridges.

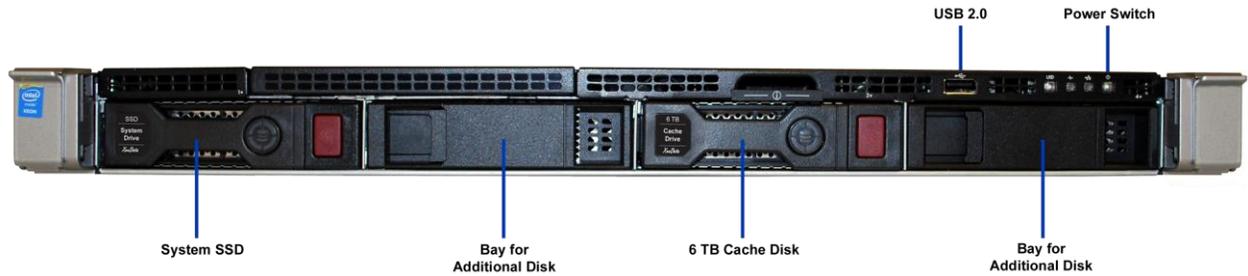


The library has 10 mail slots that provide easy import and export of individual LTO cartridges without interrupting library operations. They are accessed via the front of the library as illustrated below.

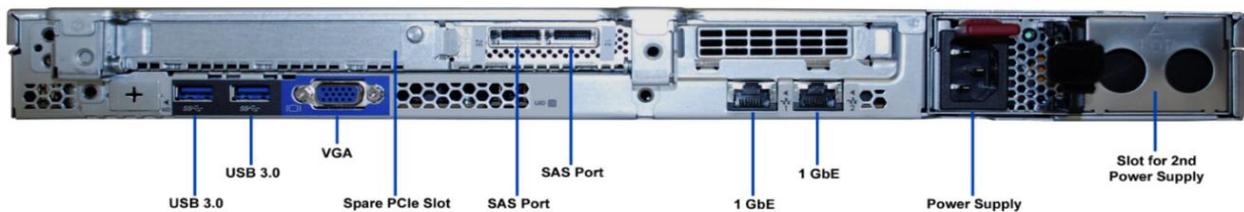


## Server Front Panel and Connections

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:



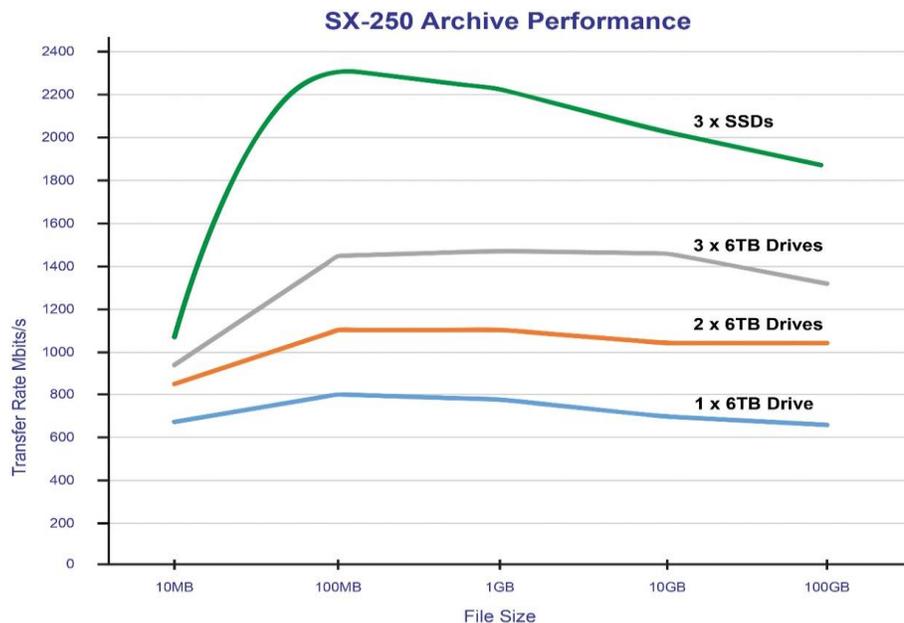
The two SAS ports connect directly to the LTO-7 drives in the library.

## Performance

The SX-250 restores files at near to the maximum transfer rate supported by the LTO drive. In the case of LTO-7, 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-7 drive with an LTO-7 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).



## Network Integration

The SX-250 runs Windows Server 2012 R2 Essentials which means it can be deployed in a Workgroup or as the domain controller in an Active Directory domain. However, it cannot be installed as a domain member in a pre-existing Active Directory domain. If this is required, the SX-250 should be upgraded to Windows Server 2012 R2 Standard Edition (SKU 111006).

## Specifications

### LTO Tape Library

<b>LTO Drives</b>	
LTO drive type:	IBM LTO-7 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
<b>Base Model Library</b>	
Library type:	Overland Storage NEOxl 80
Number of LTO drives:	1 or 2
Total slots – including mail slots:	80
Licensed Near-Line LTO Capacity:	180 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
<b>Power Requirements</b>	
Number of Power Supplies:	1 - redundant power supply is available as an upgrade option.
Voltage:	100 – 240 V
Frequency:	50 – 60 Hz
Power (peak):	350 W
<b>Dimensions / Weight</b>	
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
<b>Optional Expansion Module</b>	
Number of LTO drives:	0
Total slots:	80 slots
Licensed Near-Line LTO Capacity:	0 TB (0 slots) – slots must be licensed
Mail slots:	None
<b>Power Requirements</b>	
Number of Power Supplies:	1 – redundant power supply is available as an upgrade option
Voltage:	100 – 240 V
Frequency:	50 – 60 Hz
Power (peak):	350 W
<b>Dimensions / Weight</b>	
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 Essentials
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:	1 – redundant power supply is available as an upgrade option
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
229018	<p>Model SXL-8200-30-1xLTO7. Complete LTO-7 archive system with 180 TB near-line LTO and unlimited offline capacity. Consists of XenData SX-250 Archive Server, 6RU library with one LTO-7 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.</p> <p>Warranty: 12 months of onsite support in the USA, Canada, most European countries and many other worldwide locations. Please refer to XenData Geographical Coverage Statement.</p>
229019	<p>Model SXL-8200-30-2xLTO7. Complete LTO-7 archive system with 180 TB near-line LTO and unlimited offline capacity. Consists of XenData SX-250 Archive Server, 6RU library with two LTO-7 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.</p> <p>Warranty: 12 months of onsite support in the USA, Canada, most European countries and many other worldwide locations. Please refer to XenData Geographical Coverage Statement.</p>

## SXL-8200 Options

XenData SKU	Description
	<b>Capacity Upgrades</b>
XAS-UPG-SXL8200-20LM	Slot license upgrade to activate an additional 20 slots.
229020	6RU LTO library expansion with 80 physical slots and one power supply. Slots must be activated by purchase of slot license upgrades. Warranty: 12 months of onsite support in the USA, Canada, most European countries and many other worldwide locations. Please refer to XenData Geographical Coverage Statement.
	<b>Connectivity Options</b>
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.
	<b>Redundancy Options</b>
222010	Additional power supply for SX-250, providing dual AC power input.
108077	Additional power supply for SXL-8200 library or expansion unit, providing dual AC power input.
222050	Disk Redundancy Upgrade. Includes an additional 6 TB cache disk and system SSD which are pre-installed and configured as mirror disks.
	<b>Performance Options</b>
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.
	<b>Operating System Upgrade</b>
111006	Upgrade of operating system for SX-250 or DX-240 from Windows Server 2012 R2 Essentials to Windows Server 2012 R2 Standard Edition. This is required if the server is to be installed as a member of an existing Windows Domain.

## Additional Information

For further information, please contact XenData.

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