

IBM System Storage TS3100 and TS3200 Tape Library Express models deliver flexible tape library functions with new LTO drives

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At a glance



The TS3100 and TS3200 Tape Libraries combine IBM® tape and automation reliability at open system prices. Both libraries are designed to support entry-level unattended backup, open system attachment flexibility, and enhanced capacity and performance.

The TS3100 and TS3200 Tape Libraries include support for:

- New IBM LTO Ultrium 4 Half-high 8-Gb Fibre Channel Drives version 2 (Feature #8148)
- New IBM LTO Ultrium 4 and Ultrium 3 Half-high 6 GB SAS Drives Version 2 (Features #8049, #8149)
- Maximum data transfer rate of up to 120 MB/sec native for each Ultrium 4 drive and up to 80 MB/sec native for each Ultrium 3 drive
- Up to 800 GB native physical capacity per cartridge (1.60 TB with 2:1 compression) with Ultrium 4 800 GB media and up to 400 GB native physical capacity per cartridge (800 GB with 2:1 compression) with Ultrium 3 400 GB media
- LTO Ultrium 4 Fibre Channel and SAS Tape Drive encryption
- LTO specification adherence

The TS3100 can accommodate up to two Ultrium Half-high Tape Drives or one Ultrium Full-high Tape Drive with 24 cartridge slots in two removable magazines, including a standard one-cartridge I/O station, a remote management unit, and barcode reader.

The TS3200 can accommodate up to four Ultrium Half-high Tape Drives or two Ultrium Full-high Tape Drives with 48 data cartridge slots in four removable magazines, including a standard three-cartridge I/O station and barcode reader.

Overview

The **IBM System Storage® TS3100 Tape Library Express® Model L2U** (machine type 3573) and the **IBM System Storage TS3200 Tape Library Express Model L4U** (machine type 3573) are designed to offer high capacity and enhanced performance for the midrange open system environments. The products are included as part of the IBM System Storage tape library family of offerings.

The TS3100 and TS3200 now incorporate the new IBM Linear Tape-Open (LTO) Ultrium 4 Half-High 8-Gb Fibre Channel and LTO Ultrium 3 Half-High and LTO Ultrium 4 Half-High 6-GB SAS version 2 Drives, with a native data transfer rate of up to 120 MB/sec. Mixed Ultrium generations and attachment Tape Drive types are supported where drive space is available. New IBM Ultrium 4 SAS and Fibre Channel tape drives are encryption capable. IBM Tivoli® Key Lifecycle Manager V1 or V2 is required for encryption key management with LTO Ultrium 4 drives. The TS3100 and TS3200 Tape Libraries incorporate IBM Multi-Path Architecture with logical libraries equal to the number of drives installed. Ultrium 4 and Ultrium 3 Tape Drives for the TS3100 and TS3200 Tape Libraries are available as feature options in AAS.

By using the IBM LTO Ultrium 4 800 GB TB Data Cartridge, the Ultrium 4 Tape Drive has the capability of writing nearly twice as much data, up to 800 GB native physical capacity (1.6 TB with 2:1 compression), compared to the Ultrium 3 Tape Drive. IBM Ultrium 4 Tape Drives can read and write LTO Ultrium 3 Data Cartridges and can read Ultrium 2 Data Cartridges.

By using the IBM LTO Ultrium 3 400 GB TB Data Cartridge, the Ultrium 3 Tape Drive has the capability of writing nearly twice as much data, up to 400 GB native physical capacity (800 GB TB with 2:1 compression), compared to the Ultrium 2 Tape Drive. IBM Ultrium 3 Tape Drives can read and write LTO Ultrium 2 Data Cartridges and can read Ultrium 1 Data Cartridges.

The TS3100 Tape Library can accommodate up to two LTO Ultrium Half-high Tape Drives or one LTO Ultrium Full-high Tape Drive and comes standard with two removable cartridge magazines, one on the left side and one on the right, each with 12 data cartridge slots. The left magazine includes a single cartridge I/O station designed to allow for continuous library operation while importing or exporting media. A remote management unit and a barcode reader are standard in the library, allowing the library to run in sequential or random access mode. Optional features available include a rack mount kit, additional attachment cables, transparent LTO encryption, path failover, additional drives, interposers, and power cords.

The TS3200 Tape Library can accommodate up to four LTO Ultrium Half-high Tape Drives or two LTO Ultrium Full-high Tape Drives and comes standard with four removable cartridge magazines to provide 48 data cartridge slots, including a three-slot I/O station. A remote management unit and a barcode reader are standard in the library, allowing the library to run in sequential or random access mode. Optional features available include a rack mount kit, an additional power supply, additional removable cartridge magazines, transparent LTO encryption, path failover, additional drives, attachment cables, interposers, and power cords.

Key prerequisites

Appropriate levels of host software are required to attach and support the TS3100 or TS3200 Tape Library with IBM LTO Ultrium 4 and Ultrium 3 Tape Drives to selected IBM Power®, IBM System p®, IBM System i®, IBM System z®, IBM System x®, HP-UX, Sun, UNIX®, Linux®, and Microsoft® Windows® servers. Refer to the [Technical information](#) section for details.

Planned availability date

March 11, 2011

Description



The TS3100 and TS3200 Tape Libraries are external stand-alone or rack-mountable units that contain LTO Ultrium tape drives that are designed for the heavy demands of backup tape storage.

TS3100 Tape Library

The TS3100 has capacity for 24 tape cartridges and support for:

- A single IBM LTO Ultrium 5 Full-high Tape Drive with SAS or Fibre Channel attachment and (up to two) IBM LTO Ultrium 5 Half-high Tape Drives with SAS or Fibre Channel attachment
- A single IBM LTO Ultrium 4 Full-high Tape Drive with SAS, SCSI, or Fibre Channel attachment and (up to two) IBM LTO Ultrium 4 Half-high Tape Drives with SAS attachment
- A single IBM LTO Ultrium 3 Full-high Tape Drive with SAS, SCSI, and Fibre Channel attachment and (up to two) IBM LTO Ultrium 3 Half-High Tape Drives with SAS or SCSI attachment
- A combination of up to one IBM LTO Ultrium Full-high Tape Drive or up to two IBM LTO Ultrium Half-High Tape Drives

The TS3100 Tape Library offers the following significant improvements over existing 2U Tape Libraries:

- **Increased cartridge capacity:** The TS3100 is configured to hold two removable magazines, one on the left side (11 + 1 slots) and one on the right side (12 slots), for a total of 24 data cartridges.
- **Standard bar code reader:** With the addition of the standard bar code reader, you will be able to operate the TS3100 as a random access tape library with labeled media. Labeled Ultrium media can be ordered at the time of purchase via the 3589 LTO Ultrium media machine type, or through IBM Media at 888-IBM-MEDIA (426-6334). Refer to the [Supplies](#) section for additional information.
- **I/O station:** Standard on the TS3100 is a single-cartridge I/O station on the left cartridge magazine, which is designed to allow for continuous library operation during import or export of data cartridges.
- **Removable cartridge magazines:** The TS3100 has two removable magazines that house 24 data cartridges. This helps allow for quick population of the tape library, as well as ease of storage for media. You may order additional magazines as an option.
- **Customer replacement units (CRUs):** Drives, power supply, and cartridge magazines are customer replacement parts.

TS3200 Tape Library

The TS3200 has capacity for 48 tape data cartridges and support for:

- A single IBM LTO Ultrium 5 Full-high Tape Drive with SAS or Fibre Channel attachment and (up to two) IBM LTO Ultrium 5 Half-high Tape Drives with SAS or Fibre Channel attachment
- Up to two IBM LTO Ultrium 4 Full-high Tape Drives with SAS, SCSI, or Fibre Channel attachment and (up to four) IBM LTO Ultrium 4 Half-High Tape Drives with SAS attachment
- Up to two IBM LTO Ultrium 3 Full-high Tape Drives with SAS, SCSI, or Fibre Channel attachment and (up to four) IBM LTO Ultrium 3 Half-High Tape Drives with SAS and SCSI attachment
- A combination of up to two IBM LTO Ultrium Full-high Tape Drives, or up to four IBM LTO Ultrium Half-high Tape Drives

The TS3200 Tape Library offers the following significant improvements over existing 4U Tape Libraries:

- **Increased cartridge capacity:** The TS3200 is configured to hold four removable magazines to provide 48 data cartridges, including a three-slot I/O station.
- **Standard bar code reader:** With the addition of the standard bar code reader, you will be able to operate the TS3200 as a random access tape library with labeled media. Labeled Ultrium 4 media can be ordered at time of purchase via the 3589 LTO Ultrium media machine type, or through IBM Media at 888-IBM-MEDIA (426-6334). Refer to the [Supplies](#) section, for additional information.
- **I/O station:** Standard on the TS3200, a three-slot I/O station on the lower-left cartridge magazine, which is designed to allow for continuous library operation during import or export of data cartridges.
- **Removable cartridge magazines:** The TS3200 has four removable magazines that house 48 data cartridges to enable quick population of the tape library, as well as ease of storage for media. You may order additional magazines as an option.
- **CRUs:** Drives, power supply, and cartridge magazines are customer replacement parts.

TS3100 and TS3200 Tape Libraries

The IBM LTO Ultrium 5 Tape Drive is the fifth-generation LTO Ultrium Tape Drive in the IBM LTO Ultrium family of products. The Ultrium 5 Tape Drive in the TS3100 and TS3200 offer the following significant improvements over the Ultrium 4 Tape Drive:

- **Increased performance:** Maximum tape drive throughput native data rate performance is up to 140 MB/sec. Data tracks are written 16 at a time. IBM Ultrium 5 Tape Drives can read and write LTO Ultrium 4 Data Cartridges at Ultrium 4 capacities and rates, and read LTO Ultrium 3 Data Cartridges at Ultrium 3 capacities with improved rates.

Note: Although the Ultrium 5 Tape Drive provides the capability for excellent tape performance, other components of the system may limit the actual performance achieved. Also, although the compression technology used in the tape drive can double the amount of data that can be stored on the media, the actual degree of compression achieved is highly sensitive to the characteristics of the data being compressed.

- **Increased tape cartridge capacity:** The tape cartridge physical capacity is up to 1.5 TB native physical capacity (3.0 TB with 2:1 compression), with the use of the new IBM LTO Ultrium 5 1.5 TB Data Cartridge, nearly double that of the Ultrium 4 Data Cartridge. This is achieved by increasing the linear density and the media length. The tape itself is an advanced metal particle tape developed to help provide durability and capacity.
- **Ultrium 4 cartridge compatibility:** The Ultrium 5 Tape Drive can read and write Ultrium 4 cartridges.

- **Encryption supported on Ultrium 5 and 4 Fibre Channel and SAS tape drives:** The IBM System Storage TS3100 and TS3200 Tape Libraries support data encryption on the base drive with Ultrium 5 and 4 media meeting LTO consortium specifications and Application Managed encryption. System Managed and Library Managed Encryption are supported with the Transparent LTO Encryption feature (Feature #5900) IBM Tivoli Key Lifecycle Manager V1 or V2 is required for encryption key management with LTO Ultrium 5 drives.
- **Attachment options:** The TS3100 and TS3200 Tape Libraries come with 6 Gbps SAS or 8 Gbps Fibre Channel LTO5 tape drive attachment for connection to a wide spectrum of open system servers. They are supported on IBM POWER, System p, System i, System x, System z, Sun Solaris, HP-UX, Microsoft Windows, Linux, and other open systems.
- **WORM media support:** The IBM 3589 Ultrium 5 1.5 TB WORM Tape Cartridges are designed for applications such as archiving and data retention as well as those applications requiring an audit trail. These cartridges work with the IBM LTO Ultrium 5 Tape Drive to help prevent the alteration or deletion of user data. IBM Ultrium 5 1.5 TB WORM Tape Cartridges can be ordered as unique 3589 models with the following features:
 - Pre-labeling with the ability to specify a starting volume serial and color-coding
 - Packaging in individual jewel cases or in bulk
 - Cartridge memory, built into every cartridge, which helps to enhance functionality and media reliability by storing access history and media performance information for use by the tape drive every time the cartridge is accessed
 - Half-inch particle tape up to 800 GB WORM native capacity in a single cartridge
- **Larger internal data buffer:** There is a 512 MB internal data buffer in the Ultrium 5 Full-high Tape Drive and a 256 MB internal data buffer in the Ultrium 5 Half-high Tape Drive
- **Digital speed matching:** The Ultrium 5 Tape Drive is designed to perform dynamic speed matching at one of 14 speeds to adjust the drive's native data rate as closely as possible to the net host data rate (after data compressibility has been factored out). This helps reduce the number of backhitch repositions and improve throughput performance. Speed matching on Ultrium 5 ranges from 40 to 140 MB/sec versus 30 to 120 MB/sec on Ultrium 4.
- **Giant Magneto Resistive (GMR) head design:** LTO 5 introduces the GMR head with beveled contouring for reducing stiction/friction, especially with smoother LTO5 media type. This head design is well proven in Enterprise Tape products and helps minimize contact, edge damage, debris accumulation, and wear on the tape as it moves over the read/write heads.
- **Dual-stage 16-channel head skew actuator:** The actuator for the LTO 5 Full-high drive is designed to provide precision head alignment to help skew, to enable the head to follow skew tape motion, and improve linear actuation.
- **Power management:** The Ultrium 5 Tape Drive power management function is designed to control the drive electronics to be either completely turned off or in a low-power mode when the circuit functions are not needed for drive operation. Improvements specifically in idle mode are improved over Ultrium 4.

Proven IBM LTO Ultrium features in the IBM LTO Ultrium 4 Tape Drive include:

- **Servo and track layout technology:** There are 1280 data tracks in Ultrium 5 versus 896 data tracks in Ultrium 4. The high-bandwidth servo system features a low-mass servo to help more effectively track servo bands and improve data throughput with damaged media in less-than-optimal shock and vibration environments.
- **Surface Control Guiding Mechanism:** IBM's patented Surface Control Guiding Mechanism is designed to guide the tape along the tape path in the Ultrium 5 and 4 Tape Drive. This method is designed to use the surface of the tape, rather than the edges, to control tape motion. This helps reduce tape damage (especially to the edges of the tape) and tape debris, which comes from the damaged edges and can accumulate in the head area.
- **Robust drive components optimized for automation environments:** Using some of the most robust components available, such as all-metal clutch, steel

ball bearings in loader, robust leader block design, and single circuit card, to help enhance reliability and prolong the life of the drives.

- **Separate writing of multiple filemarks:** Separate writing of multiple filemarks is designed to evoke any write command of two or more filemarks to cause a separate data set to be written containing all filemarks after the first. It helps improve performance if a subsequent append overwrites somewhere after the first filemark. This change helps prevent having to rewrite data sets containing customer data and the first filemark, if such an append occurs.
- **LTO Data Compression (LTO-DC):** The Ultrium 4 uses LTO-DC, which is an implementation of a Lempel-Ziv class 1 (LZ-1) data compression algorithm. LTO-DC is an extension of Adaptive Lossless Data Compression (ALDC) and an improvement over previous IBM lossless compression algorithms. IBM's patented "Scheme-Swapping" compression is designed to look ahead at incoming data, and determine the most efficient storage method (either ALDC or pass-through mode) to help optimize data compression and increase data throughput.
- **LTO Cartridge Memory (LTO-CM):** Contained within the LTO Ultrium data cartridge is the LTO-CM, which is a passive, contactless silicon storage device that is physically a part of the cartridge. The LTO-CM is designed to hold information about that specific cartridge, the media in the cartridge, and the data on the media. The storage capacity of the LTO-CM is 8 KB. Communication between the drive and the LTO-CM is via a low-level RF field transmitted by the drive to the cartridge.
- **Statistical Analysis and Reporting System (SARS):** The Ultrium 4 Tape Drive uses SARS to help isolate failures between media and hardware. SARS uses the cartridge performance history saved in the CM module and the drive performance history kept in the drive flash EEPROM to help determine the likely cause of failure. SARS is designed to cause the drive to request a cleaner tape, to mark the media as degraded, and to indicate that the hardware has degraded.
- **Highly integrated electronics using IBM engineered copper technology:** This technology is designed to reduce the total number of components in the drive, help lower chip temperatures, and reduce power requirements, helping to provide for a more reliable drive. The fourth-generation drive electronics are designed to provide error correction of soft errors in the memory arrays in data and control paths.

Ultrium Data Cartridges: The tape cartridge physical capacity of the IBM Ultrium 1.5 TB Data Cartridge has nearly doubled over the IBM Ultrium 800 GB Data Cartridge to 1.5 TB native physical capacity (3.0 TB with 2:1 compression). IBM LTO Ultrium 5 Tape Drives can read and write Ultrium 4 data cartridges, and read only Ultrium 3 data cartridges. LTO Ultrium 1.5 TB data cartridges can be ordered using machine type 3589, LTO Ultrium tape cartridges or feature #8505 at the time of purchase.

The tape cartridge physical capacity of the IBM Ultrium 800 GB Data Cartridge has nearly doubled over the IBM Ultrium 400 GB Data Cartridge to 800 GB native physical capacity (1.6 TB with 2:1 compression). IBM LTO Ultrium 4 Tape Drives can read and write Ultrium 3 data cartridges, and read only Ultrium 2 data cartridges. LTO Ultrium 800 GB data cartridges can be ordered using machine type 3589, LTO Ultrium tape cartridges or feature #8405 at the time of purchase.

These cartridges have been developed to provide several enhancements over previous tape technologies. They are designed to work with tape drives that have increased tape speeds and high-density data recording. The case is specially designed for use in automated libraries and is designed for repeated, unattended handling. The tape itself is an advanced metal particle tape developed for durability and capacity.

Path failover option: With the introduction of IBM LTO Ultrium 5 Tape Drive support, the TS3100 and TS3200 Tape Libraries will support Control Path Failover and Data Path Failover for all generations of IBM LTO Ultrium Half-High Tape Drives.

Multi-Path support: The Multi-Path feature of the libraries support sharing of the library robotics. The library can be partitioned into one or two logical libraries and can provide each logical library its own separate and distinct drives, storage slots,

and control paths. You can partition the library into as many logical libraries as there are drives in the library. Each logical library must contain at least one drive.

Note: This type of partitioning is designed to allow heterogeneous applications to share the library robotics independent of each other. Cartridges under library control are not shared between logical libraries, nor allowed to be moved between logical libraries. An example of heterogeneous sharing is a Microsoft Windows application using the drive and storage slots of one logical library while a UNIX application uses the drive and slots of another logical library.

Product positioning

As you compare competitive tape solutions, consider:

- Capacity and performance requirements
- Data protection, reliability, and availability
- Storage usage and application requirements
- Affordability
- Loyalty to legacy or existing tape formats
- Security and encryption
- Work environment - limited space

The TS3100 and TS3200 Tape Libraries and storage management applications help address these requirements and constitute a functionally rich tape storage solution incorporating LTO Ultrium tape technology. The libraries deliver flexibility of tape library management and unattended save and restore operations. The TS3100 or TS3200 are excellent solutions if you use tape or require a larger-capacity or higher-performance tape backup with or without random access. They are excellent choices for tape automation for IBM Power, System p, System i, System x, System z, HP-UX, Sun, UNIX, Linux, and Microsoft Windows servers.

The TS3100 offers one IBM Ultrium Full-high Tape Drive or up to two IBM LTO Ultrium Half-High Tape Drives, 24 cartridge slots (including one-cartridge I/O station). The TS3200 offers up to two IBM LTO Ultrium Full-high Tape Drives or up to four IBM LTO Ultrium Half-High Tape Drives and 48 cartridge slots (including a three-cartridge I/O station).

The TS3100 and TS3200 can be the answers to growing storage requirements and shrinking backup windows, and are part of a family of IBM System Storage LTO Ultrium tape products. These products constitute excellent tape storage solutions if you have an existing digital linear tape experience or require high-performance automated tape backup.

For lower capacity requirements with less than 24 or 48 cartridges, the IBM System Storage TS2900 Tape Autoloader and the IBM System Storage TS2250 or TS2350 or 3580 Tape Drive should be considered.

For larger capacity requirements greater than 48 cartridges, with drives and cartridge capacity scalability, the IBM System Storage TS3310 Tape Library (machine type 3576) should be considered.

Customers can now tailor the TS3310 Tape Library to match system capacity and performance needs with up to 18 IBM LTO Ultrium tape drives total in an L5B plus four E9U systems.

For even larger capacity requirements, the IBM System Storage TS3500 Tape Library (machine type 3584) should be considered. The 3584 Tape Library can address system capacity using up to 192 IBM Ultrium Tape Drives in up to sixteen 3584 library frames.

For protection of mission-critical data needs, hardware optimized for enterprise multimode and host attachment, high duty-cycle and start/stop intensive tape applications, consider the IBM System Storage TS1120 or TS1130 Tape Drive with

the IBM System Storage TS3400 (3577) or IBM System Storage TS3500 (3584) Tape Library.

Product number

Description	Machine type	Model	Feature
Ultrium 3 Half-high SAS Tape Drive V2	3573	L2U,L4U	8049
Ultrium 4 Half-high Fibre Channel Drive V2	3573	L2U,L4U	8148
Ultrium 4 Half-high SAS Tape Drive V2	3573	L2U,L4U	8149
Path Failover	3573	L2U,L4U	1682*
2.0M SAS/Mini-SAS 1x Cable	3573	L2U,L4U	5402*
2.0M Mini-SAS/Mini-SAS 1x Cable	3573	L2U,L4U	5502*
13M LC-LC Fibre Channel Cable	3573	L2U,L4U	6013*
25M LC-LC Fibre Channel Cable	3573	L2U,L4U	6025*

Note: * Previously announced feature

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=111-040>

Publications

The following publications are shipped with the products. Additional copies will be available.

Title	Order number
IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide	GA32-0545
IBM System Storage TS3100/TS3200 Tape Library Getting Started Guide	GA32-0548

The publication listed above and the following publications are also available at

<http://www.ibm.com/storage/tape/lto>

The device driver publications are also available at

<ftp://ftp.software.ibm.com/storage/devdrv/Doc/>

Title	Order number
IBM System Storage TS3100 Tape Library and TS3200 Tape Library SCSI Reference	GA32-0547
IBM Tape Device Driver Programming Reference	GC32-0566

The IBM Systems Information Center provides a single information center where product documentation for IBM systems hardware, operating systems, and server software can be accessed. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems Information Center is at

<http://publib14.boulder.ibm.com/infocenter/systems>

IBM Publications Center Portal

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. A large number of publications are available online in various file formats, which can currently be downloaded free of charge at

<http://www.ibm.com/shop/publications/order>

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

<http://www.ibm.com/services/>

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

<http://www.ibm.com/services/continuity>

For details on education offerings related to specific products, visit

<http://www.ibm.com/services/learning/index.html>

Select your country, and then select the product as the category.

Technical information

Specified operating environment

Physical specifications

3573 Model L2U

- Width: Rack mount 447.5 mm (17.6 in), stand-alone 447.5 mm (17.6 in)
- Depth: Rack mount 740 mm (29.13 in), stand-alone 810 mm (31.9 in)
- Height: Rack mount 87.6 mm (3.44 in), stand-alone 97.6 mm (3.84 in)
- Maximum Weight: 15.6 kg (34.3 lb) without rack mount

3573 Model L4U

- Width: Rack mount 447.5 mm (17.6 in), stand-alone 447.5 mm (17.6 in)
- Depth: Rack mount 740 mm (29.13 in), stand-alone 810 mm (31.9 in)
- Height: Rack mount 175.2 mm (6.9 in), stand-alone 185.2 mm (7.3 in)
- Maximum Weight: 21.3 kg (47 lb) without rack mount

To assure installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

Operating environment

3573 Model L2U

- Temperature: 10 to 35° C, 50 to 95° F
- Relative humidity: 15% RH to 80% RH (noncondensing)
- Wet bulb: 26° C (79.0° F) maximum
- Voltage: 100 to 240 V ac, 50 to 60 Hz auto-ranging
- Electrical power:
 - 4.0 amps at 100 V ac
 - 2.0 amps at 240 V ac
 - 0.1 kVA
- Maximum acoustical noise sound power levels LwAd in bels: 6.6/6.8
- Heat output: 100 watts (86 KCal/Hr.)

3573 Model L4U

- Temperature: 10 to 35° C, 50 to 95° F
- Relative humidity: 15% RH to 80% RH (noncondensing)
- Wet bulb: 26° C (79.0° F) maximum
- Voltage: 100 to 240 V ac, 50 to 60 Hz auto-ranging
- Electrical power:
 - 4.0 amps at 100 V ac
 - 2.0 amps at 240 V ac
 - 0.1 kVA
- Maximum acoustical noise sound power levels LwAd in bels: 6.6/6.8
- Heat output: 100 watts (86 KCal/hr)

Hardware requirements

The TS3100 and TS3200 Tape Libraries come with raven black covers.

The TS3100 Model L2U and TS3200 Model L4U support the new Ultrium 4 Half-High SAS Tape Drive and can be attached to System p, AIX®, Linux, and Microsoft Windows servers, and non-IBM servers, workstations, and personal computers that support those interface specifications.

A current list of supported open system configurations is available at

<http://www-03.ibm.com/systems/support/storage/config/ssic/index.jsp>

A power cord feature number, if applicable, should also be specified.

The TS3200 comes with one power supply and an additional power supply can be added with the following feature:

- Additional Power Supply (Feature #1901)

If ordered as an option, the Additional Power Supply will come with a power cord based on the original order. If the Additional Power Supply feature is ordered, then two power cords will be supplied based on the power cord feature ordered.

Cables

Cables are required to attach tape drives in the TS3100 or TS3200 Tape Library to each server connection (up to the number of tape drives installed).

An interposer may also be required for attachment to various server adapters. One or more of the following Fibre Channel or SAS cables should be specified on the TS3100 or TS3200.

Fibre Channel cables: A Fibre Channel cable is required to attach a TS3100 or TS3200 Tape Library with Fibre Channel Ultrium Tape Drives to host Fibre Channel adapters, Fibre Channel switches, or other Fibre Channel components. At least one Fibre Channel cable should be specified on the initial Fibre Channel drive plant order. The IBM Ultrium 5 (8 Gbps) Fibre Drive comes with an LC Duplex connector.

Features for specifying Fibre Channel cables and their respective lengths are as follows:

- Feature #6013 - 13 meter LC-LC Fibre Channel Cable
- Feature #6025 - 25 meter LC-LC Fibre Channel Cable

SAS cables: A SAS cable is required to attach a TS3100 or TS3200 to the server host bus SAS adapter. SAS/Mini-SAS cables provide attachment from HBA with SFF-8470 to drives with SFF-8088. Mini-SAS/Mini-SAS cables provide attachment from HBA SFF-8088 to drives with SFF-8088. At least one SAS cable should be specified on the initial plant order.

The following cable options are available for SAS attachment:

- 2.0 m SAS/Mini-SAS 1x Cable (from HBA with SFF-8470 to drive with SFF-8088) (Feature #5402)
- 2.0 m Mini-SAS/Mini-SAS 1x Cable (from HBA with SFF-8088 to drive with SFF-8088) (Feature #5502)

SAS Interposers

A 1x4 interposer with either SAS/Mini-SAS or Mini-SAS/Mini-SAS connectors is available for connecting up to four Mini-SAS/Mini-SAS 1x cables and their respective SAS drives to a single host bus adapter port. Mini-SAS/Mini-SAS 1x cable (Feature #5502), connects the interposer to the drive and needs to be ordered separately.

The following interposers are available:

- SAS/Mini-SAS 4x Interposer (from HBA with SFF-8470 to maximum four cables with SFF-8088) (Feature #5400)
- Mini-SAS/Mini-SAS 4x Interposer (from HBA with SFF-8088 to maximum four cables with SFF-8088) (Feature #5500)

Refer to the **Specify or special features** section of the Sales Manual for a detailed description of the above features.

Software requirements

For a current list of host software versions and release levels that support the TS3100 or TS3200, visit

<http://www-03.ibm.com/systems/support/storage/config/ssic/index.jsp>

Tivoli Storage Manager and other compatible software offerings provide storage and tape management software for the TS3100 or TS3200. Supporting software and applications must be obtained separately from IBM, IBM Business Partners, or ISVs. A list of compatible software is available from your IBM representative or at

<http://www-03.ibm.com/systems/storage/tape/library.html#compatibility>

Select "Compatibility Information", then and "Independent Software Vendor (ISV) matrix for LTO" for the product.

IBM continues to work together with the ISVs to support the TS3100 or TS3200 Tape Library. Individual application vendors should be contacted for specific information and availability dates.

IBM maintains the latest levels of System Storage tape drive and library device drivers and documentation on the Internet. Utilize the Fix Central download portal by visiting

<http://www.ibm.com/support/fixcentral>

There are a few pull down menus to navigate to the correct download as follows:

- In the first pull down menu labeled "Product Group" select "Storage Systems"
- In the next pull down menu that appears which is labeled "Product Family" select "Tape Systems"
- With the next pull down menu, "Product Type", select "Tape Device Drivers and Software"
- This will in turn bring up the "Product" menu, which provides selections for "Platform drivers, Tools, or Software"
- Under "Platform drivers", in order to download your driver, select the correct operating system
- Two more pull down menus will appear with information. Click "Continue"
- The next screen can be used to narrow the search, however just click "Continue" to view what is available

The IBM Tape Device Drivers Installation and User's Guide can be found at

<http://www-01.ibm.com/support/docview.wss?rs=577&uid=ssg1S7002972>

LTO Ultrium Encryption

Encryption for the TS3100/TS3200 Tape Library, with SAS and Fibre Channel versions of the IBM LTO Ultrium 5 and Ultrium 4 Tape Drive is provided in AIX, HP-UX, Linux, Sun Solaris, and Microsoft Windows 2003 operating system environments.

The installation of a Ultrium 5 and 4 Tape Drive with encryption may require code updates for System p and supported open systems device drivers or storage management software. An update of the open systems device drivers can be obtained from the Fix Central download portal by accessing the following website

<http://www.ibm.com/support/fixcentral>

There are a few pull down menus to navigate to the correct download as follows:

- In the first pull down menu labeled "Product Group" select "Storage Systems".
- In the next pull down menu that appears which is labeled "Product Family" select "Tape Systems".
- With the next pull down menu, "Product Type", select "Tape Device Drivers and Software".
- This will in turn bring up the "Product" menu, which provides selections for "Platform drivers, Tools, or Software".
- Under "Platform drivers", in order to download your driver, select the correct operating system.

- Two more pull down menus will appear with information. Click "Continue".
- The next screen can be used to narrow the search, however just click "Continue" to view what is available.

The IBM Tape Device Drivers Installation and User's Guide can be found at the following website

<http://www-01.ibm.com/support/docview.wss?rs=577&uid=ssg1S7002972>

For details on supported software versions and release levels for the Ultrium 5 and 4 Tape Drive, as well as hardware support information, refer to the following website

<http://www.ibm.com/storage/tape>

Three modes of encryption management are supported:

- System Managed (available for AIX, Linux, Solaris, Windows)
- Library Managed (available for OS/400®, i5/OS®, AIX, Linux, HP-UX, Solaris, and Windows)
- Application Managed (IBM Tivoli Storage Manager)

For LTO Ultrium 5 and 4, the IBM Tivoli Key Lifecycle Manager V1.0 or V2.0 is required for enabling System Managed and Library Managed Encryption.

Compatibility

The IBM LTO Ultrium 5 Tape Drives can read and write IBM LTO Ultrium 5 and 4 Data Cartridges and read IBM LTO Ultrium 3 Data Cartridges. The LTO Ultrium 1.5 TB Data Cartridges can only be used on the IBM LTO Ultrium 5 Tape Drives.

The IBM LTO Ultrium 4 Tape Drives can read and write IBM LTO Ultrium 4 and 3 Data Cartridges and read IBM LTO Ultrium 2 Data Cartridges. The LTO Ultrium 800 GB Data Cartridges can only be used on the IBM LTO Ultrium 5 and 4 Tape Drives.

Limitations

SAS cable lengths are limited to a maximum of 6 meters (20 ft).

Fibre channel cable lengths are limited to 500 meters (1650 ft).

The TS3100 or TS3200 Tape Library operating environment must not conflict with media operating and storage requirements. If media is stored in the TS3100 or TS3200 Tape Library for more than 10 hours, the media storage temperature requirements must be met.

Planning information

Customer responsibilities

Physical installation and service planning is a customer responsibility. Detailed planning information is in the *IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide* (GA32-0545). The TS3100 and TS3200 Tape Libraries are designated as a customer setup unit (CSU). It is the customer's responsibility to install and service, if required, the unit. Customers are responsible for obtaining the appropriate adapters, cables, and interposers (if required) for system attachment. Customers are also responsible for ordering media. For optimum performance, the customer must obtain the latest level of firmware prior to installing the unit and must update the unit as new firmware release becomes available.

Customers can download the latest level of drive and library firmware from the LTO website

<http://www.ibm.com/storage/tape/lto>

Note: IBM offers IBM Installation and Maintenance support at an additional cost if the customer does not wish to install or maintain the TS3100 or TS3200 Tape Library.

You are responsible for downloading or obtaining from IBM, and installing designated Machine Code (microcode, basic input/output system code (called BIOS), utility programs, device drivers, and diagnostics delivered with an IBM machine) and other software updates in a timely manner from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides. You may request IBM to install Machine Code changes; however, you may be charged for that service.

Cable orders

A SAS cable for IBM Ultrium SAS Tape Drives is required to attach the TS3100 or TS3200 to the server. At least one cable should be specified on the initial plant order with the SAS Drive feature. An interposer or interposers may be required for attachment to various server adapters. Customers are responsible for selecting and ordering the correct cables and interposers to match the IBM LTO Ultrium Tape Drive interface and the server interface.

A Fibre Channel cable is required to attach a TS3100 or TS3200 Tape Library with Fibre Channel Ultrium Tape Drives to host Fibre Channel adapters, Fibre Channel switches, or other Fibre Channel components. At least one Fibre Channel cable should be specified on the initial Fibre Channel drive plant order. The IBM Ultrium (8 Gbps) Fibre Drives come with an LC Duplex connector.

Refer to the **Cables** section at the end of [Hardware requirements](#) for a list of available cables and interposers.

Refer to the **Specify or Special Features** section of the TS3100 or TS3200 Sales Manual for a detailed description of the cables and interposers available.

Installability

Installation time for the IBM System Storage TS3100 Tape Library Model L2U, when rack-mounted, is approximately 3.5 to 4 hours, and when stand-alone, installation is approximately 1.5 hours.

Installation time for the TS3200 Tape Library is approximately four hours. Installation time for an additional tape drive installed in the TS3200 Tape Library is approximately one hour.

Refer to the *IBM System Storage TS3100/TS3200 Tape Library Setup, Operator, and Service Guide*, GA32-0545.

Packaging

Product	Shipment group	Number of boxes
3573-L2U	TS3100 Tape Library Express Model L2U IBM Ultrium Drives (ordered separately) Power Cord (must be selected) One IBM Ultrium Cleaning Cartridge (universal) IBM System Storage TS3100/TS3200 Tape Setup, Operator, and Service Guide IBM System Storage TS3100/TS3200 Tape Library Installation Quick Reference China RoHS Statement Quality Hotline Card Device Driver readme sheet Safety pointer multi-language readme sheet License Agreement for Machine Code NLS Translated Safety CD Misc. Documents CD	1
3573-L4U	TS3200 Tape Library Express Model L4U IBM Ultrium Tape Drives (ordered separately)	1

Power Cord (must be selected)
One IBM Ultrium Cleaning Cartridge (universal)
IBM System Storage TS3100/TS3200 Tape Setup, Operator,
and Service Guide
IBM System Storage TS3100/TS3200 Tape Library Installation
Quick Reference
China ROHS Statement
Quality Hotline Card
Device Driver readme sheet
Safety pointer multi-language readme sheet
License Agreement for Machine Code
NLS Translated Safety CD
Misc. Documents CD

Supplies

For end users and remarketers (IBM tape supplies)

The LTO Ultrium 5 1.5 TB Data Cartridges (feature #8505 or SEO #46C2084) and the IBM LTO Cleaning Cartridge (feature #8002 or SEO #23R7008) can be purchased from IBM with the initial order. IBM media can also be ordered directly through AAS using Machine Type 3589. Refer to the 3589 Sales Manual for further information.

The LTO Ultrium 4 800 GB Data Cartridges (feature #8405 or SEO #95P4278) and the IBM LTO Cleaning Cartridge (feature #8002 or SEO #23R7008) can be purchased from IBM with the initial order. IBM media can also be ordered directly through AAS using Machine Type 3589. Refer to the 3589 Sales Manual for further information.

IBM TS3100 and TS3200 supplies can be also purchased through Priority Fulfillment Services and its distribution channel in North America, Latin America, and Asia Pacific. These supplies can be purchased through Forex Telegistics BV and its distribution channel in Europe, the Middle East, and Africa.

For information about Priority Fulfillment Services distribution channels, call 1-888-IBM Media in the U.S. and Canada or visit

<http://www.ibm.com/storage/media>

Security, auditability, and control

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Terms and conditions

MES discount applicable

Equal to the volume commitment discount

Field installable feature

Yes

Warranty period

Three years. IBM Ultrium media is warranted separately.

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature which replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified

otherwise, the warranty period, type of warranty service, and service level of a part or feature is the same as the machine it is installed.

Machine code

Same license terms and conditions as base machine

Optional features warranty period

- Optional feature(s) - Three years. IBM Ultrium media is warranted separately.

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature which replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature is the same as the machine it is installed.

Pricing

Description	Machine type	Model	Feature number
Ultrium 3 Half-high SAS Tape Drive V2	3573	L2U, L4U	8049**
Ultrium 4 Half-high Fibre Channel Drive V2	3573	L2U, L4U	8148**
Ultrium 4 Half-high SAS Tape Drive V2	3573	L2U, L4U	8149**

Feature number	Field install only	Plant install only	MES removal	Cables required
8049	N	N	Y	Y
8148	N	N	Y	Y
8149	N	N	Y	Y

** If field installed on a purchased machine, parts removed or replaced become the property of IBM and must be returned.

Pricing terms

Prices in the following PDF prices link are suggested list prices on day of announcement for the U.S. only. They are provided for your information only. Dealer prices may vary, and prices may also vary by country. IBM list price does not include tax or shipping and is subject to change without notice.

[ENUS-111-040-List_prices_2011_02_15.PDF](#)

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