

IBM System Storage TS2900 Tape Autoloader

IBM Storage at-a-glance guide

The IBM® System Storage® TS2900 Tape Autoloader is designed for entry-level automation for small-to-medium business environments. With a low profile, high-density storage capacity, the TS2900 is ideally suited for backup and archival operations. The TS2900 is available with IBM Linear Tape-Open (LTO) 5 Half-High and LTO-4 Half-High SAS tape technology for a high-capacity, entry-priced tape storage solution.

The TS2900 Tape Autoloader is shown in Figure 1.



Figure 1. TS2900 Tape Autoloader

The TS2900 is equipped with standard features designed to provide ease-of-use and secured data backup. Web-based remote management, a bar code reader, and a removable tape magazine help provide ease of use. The TS2900 can be used in a rack system, or on a desktop next to a server in an office. These types of features help reduce the requirements of IT personnel staff, and also help centralize backup in the data center. The TS2900 is also designed to support the encryption of sensitive user data in combination with LTO-5 Half-High (HH) or LTO-4 Half-High tape technology from IBM. With 6 Gbps SAS attach, the TS2900 is supported on IBM Power Systems™, IBM System x®, Intel, and other competitive open system server platforms.

Did you know?

The TS2900 1U slim profile rack system environment is designed for automated, high-capacity tape storage and has the lowest entry price of any IBM tape automation offering IBM Half-High tape technology. The IBM LTO Half-High technology delivers reliable performance for small-to-medium open system environments. The single I/O station helps support continuous backup and archive library operations, and the removable magazine facilitates the offsite relocation of cartridges and archival data. The design of the remote library management through a standard web interface offers flexibility and greater administrative control of storage operations without the need to touch the unit.

Highlights

The TS2900 has a nine-data-slot cartridge capacity for a total storage capacity of up to 27 TB with 2:1 compression, and also a single I/O station designed to provide undisturbed library operation when extracting or inserting data cartridges. The library utilizes one IBM Half-High LTO drive, either an IBM Half-High LTO generation 5 in the TS2900 Model S5H/S5H, or an IBM Half-High LTO generation 4 in the TS2900 Model S4H/S4R. The TS2900 is shipped as a rack mount unit, with the option of a desktop conversion kit. The TS2900 comes standard with a bar-code reader, supporting the operations in sequential or random access mode. Remote administration and management capabilities are possible through the web interface that comes standard.

LTO Technology

With its use of one Ultrium LTO-5 Half-High or one Ultrium LTO-4 Half-High tape drive and a nine-tape cartridge capacity the TS2900 can store up to 27 TB compressed (13 TB native). The IBM Ultrium LTO-5 tape drive supports up to 140 MBps native data-transfer. IBM's LTO standards leadership continues with the LTO-4 tape drive doubling the storage capacity of its predecessor and the LTO-5 tape drive doubling the storage capacity of the LTO-4 tape drive with 3.0 TB compressed (1.5 TB native) on LTO-5 media.

Both drives are backward compatible (read and write) with their predecessor LTO media, and have read capability of LTO media two generations back. They both have speed matching and channel calibration for improved performance. They support the leading operating systems and popular backup software.

Security

Data is one of the most highly valued resources in a competitive business environment. Protecting that data, controlling access to it, and verifying its authenticity while maintaining its availability are priorities in our security-conscious world. Increasing regulatory requirements are also helping to drive the need for the adequate security of data. Ultrium LTO-4 and LTO-5 drive technology helps address security and compliance requirements with its continued Write Once Read Many (WORM) and Application Managed Encryption (AME) capability.

Advanced encryption through Library Managed Encryption (LME) and System Managed Encryption (SME) are available as optional Transparent LTO Encryption feature 5900. For key management for encryption IBM Tivoli® Key Lifecycle Manager (TKLM) V2 is required. Whether encryption is application or hardware-based, vital data can securely be stored to help ensure compliance with data security, information disclosure, and privacy regulations for data at rest.

IBM Linear Tape File System (LTFS)

LTFS is the first file system that works in conjunction with LTO generation 5 tape technology to set a new standard for ease-of-use and portability for open systems tape storage. This drive is the first LTO generation to introduce media partitioning, which allows LTO-5 media to be divided into segments, improving accessibility by providing the ability to quickly locate data to retrieve or update.

With LTFS, accessing data stored on an IBM tape cartridge became as easy and intuitive as using a USB flash drive. With LTFS file manager, reading data on a tape cartridge can be as easy as dragging and dropping. Users can run any application designed for disk files against tape data without being concerned that the data is physically stored on tape. Built on the LTO Ultrium 5 format standard, IBM Linear Tape File System Library Edition provides a direct, intuitive, graphical access to data stored in IBM tape drives and libraries using LTO generation 5 tape cartridges.

Benefits of LTFS Library Edition (LE) are as follows:

- The graphical user interface helps reduce complexity by enabling an icon-based view of an LTO-5 library, including tape cartridges and files using the operating system's file manager.
- LE can help reduce costs because it does not require any additional tape management software or utilities.
- The file system API of the operating system is used to provide a basic read/write interface to the tape library for applications without any additional operating system enhancements such as “plug-ins” or service packs.
- “Mount-less” cartridge inquiry for fast access is achieved after the tape library is inventoried. Tape cartridges do not have to be remounted to retrieve content index data, and basic cartridge information such as volume name, serial number, and others.
- LTFS LE software can be ordered concurrently with hardware or as software only for installed supported tape libraries. LTFS LE for LTO-5 drives can be ordered as PID software base order number 5639-LT1. The feature number is 5806.

Part number information

Table 1 lists part numbers and feature codes for the TS2900.

Table 1. TS2900 Tape Autoloader ordering information

Description		HVEC	MTM
TS2900 Tape Autoloader with Ultrium 5 Half-High SAS tape drive		3572S5R	3572-S5H
TS2900 Tape Autoloader with Ultrium 4 Half-High SAS tape drive		3572S4R	3572-S4H
Optional feature codes		Part number	Feature code
Transparent LTO Encryption		45E3797	5900
Rack mount kit		45E3785	7006
Deskside covers		45E3789	7010
Additional Magazine		45E3793	8111
Ultrium Tape Cartridges WORM media*	Ultrium 5 media 5-packs	46C2084	8505
	Ultrium 4 media 5-packs	95P4278	8405
	Ultrium 3 media 5-packs	95P2020	8305
Ultrium Cleaning Cartridge		23R7008	8002
Attachments			
2.0 m SAS/Mini-SAS 1x Cable		95P4711	5402
2.0 m Mini-SAS/Mini-SAS 1x Cable		95P4713	5502

* Ultrium 3, 4, and 5 WORM media and tape cartridge options can be ordered at:
<http://www.ibm.com/systems/storage/media/tapemediacenter/>

The IBM Ultrium WORM cartridges (Machine Type 3589) were designed for applications, such as archiving and data retention, and for applications that require an audit trail. IBM Ultrium 3, 4, and 5 Tape Drive WORM support allows vital data to be stored in a non-erasable, non-rewritable format provided for these types of applications. The IBM Ultrium WORM cartridges work with the IBM System Storage LTO Ultrium Tape Drives to help prevent the alteration or deletion of user data. In addition, IBM has taken several steps to reduce the possibility of tampering with the information:

- The bottom of the cartridge is molded in a different color than rewritable cartridges.
- The special cartridge memory helps protect the WORM nature of the media.
- A unique format is factory-written on each WORM cartridge.

Table 2 lists the specifications for the TS2900.

Table 2. TS2900 specifications

Specifications	
Tape drive type	1 Ultrium 4 Half-High or 1 Ultrium 5 Half-High
Number of tape cartridges	9
Number of I/O slots	1
Tape media physical capacity	<ul style="list-style-type: none"> Up to 3.0 TB per cartridge compressed; 1.5 TB native with LTO-5 media Up to 1.6 TB per cartridge compressed; 800 GB native with LTO-4 media Up to 800 GB per cartridge compressed; 400 GB native with LTO-3 media
Data transfer rate (per drive)	<ul style="list-style-type: none"> Up to 140 MBps native with Ultrium LTO-5 tape drive Up to 120 MBps native with Ultrium LTO-4 tape drive
Tape Autoloader Capacity	<ul style="list-style-type: none"> Up to 27 TB per tape library compressed; 13.5 TB native with LTO-5 media Up to 14.4 TB per tape library compressed; 7.2 TB native with LTO-4 media Up to 7.2 TB per tape Library compressed; 3.6 TB native with LTO-3 media
Attachment support	6 Gbps SAS
Warranty	One-year, Customer Replaceable Unit (CRU) service in most countries
Operating environment	
Dimensions (W x H x D)	17.6 in (445 mm) x 1.7 in (43.6 mm) x 33.3 in (847 mm)
Weight	<ul style="list-style-type: none"> 28.66 lb. (13 kg) with no drive and no cartridge 39.7 lb (18 kg) with drive and cartridge
Temperature	50 to 100 degrees F (10 to 38 degrees C)
Relative humidity	20% RH to 80% RH
Electrical power	1.3 amps at 100 V ac; 0.7 amps at 240 V ac 0.1 KVA
Noise level	6.6 dBa (idle); 6.8 dBa

What's in the TS2900 shipment group box?

The group box contains the following items:

- Tape autoloader with Ultrium 4 Half-High (Model S4H/S4R) or Ultrium 5 Half-High drive (Model S5H/S5R)
- Rack Mount Kit with Device to PDU line cord or Deskside Cover (one must be selected)
- SAS wrap tool
- Drive includes two Mini-SAS (SFF-8088) connectors
- One removable nine-cartridge magazine
- Power Cord (must be selected)
- One IBM Ultrium Cleaning Cartridge (universal)
- *IBM System Storage TS2900 Tape Autoloader Setup, Operator, and Service Guide, GC27-2212-02*
- *IBM System Storage TS2900 Tape Autoloader Installation Quick Reference Guide, GA76-0423-00*

- Quality Hotline Card
- Device Driver readme sheet
- IBM System Storage Translated Safety Notices
- Multi-language Statement of Limited Warranty
- Statement of Limited Warranty Pointer Sheet
- Misc Documents CD

Supported hardware platforms

Supported hardware platforms for the TS2900 are as follows:

- IBM BladeCenter®
- IBM Power Systems®
- IBM System i®
- IBM System p®
- IBM System x®
- Advanced Micro Devices (AMD)
- Hewlett Packard
- Intel (x86 and x86_64)
- Sun

Supported operating systems

Supported operating systems for the TS2900 are as follows:

- IBM AIX® 7.1 or later
- IBM i 7.1 or later
- HP HP-UX 11iv3 or later
- Microsoft Windows Server 2003 SP2 or later
- Microsoft Windows Server 2008 SP2 or later
- Microsoft Windows Server 2008 R2 or later
- Novell SUSE Linux Enterprise 11 SP1 or later
- Red Hat Enterprise Linux 5.5 or later
- Sun Solaris 10 or later

Check the latest support levels and configuration information for LTO drives, platforms, operating systems, and attachments at the Systems Storage Interoperation Center (SSIC):

<http://www.ibm.com/systems/support/storage/config/ssic>

Supported software products

The TS2900 supported software products are as follows:

- IBM: Linear Tape File System Library Edition
- IBM: Tivoli Storage Manager
- IBM: Tivoli Key Lifecycle Manager (TKLM)
- Atempo: Time Navigator 4.1/4.2
- BakBone Software: NetVault
- CommVault Systems: Galaxy
- CA: ARCserve Backup
- EMC: NetWorker
- Symantec: Backup Exec 12.5 and 2010
- Symantec: NetBackup
- Thales Encryption Manager for Storage: TEMS
- Yosemite: Backup

For current IBM software products and independent software vendor products that support TS2900, see the Independent Software Vendor (ISV) matrix for 3592 and LTO drives:

ftp://public.dhe.ibm.com/storage/tape/lto_isv_matrix.pdf

Warranty period and warranty service

Every TS2900 is covered by the following warranty:

- System one year

Optional IBM features initially installed in an IBM system carry the same warranty and warranty service support category as the system. If installed after the initial system installation, they carry the balance of the system warranty or the optional feature warranty, whichever is greater.

Customer replaceable unit (CRU) service

IBM provides replacement CRUs for you to install. CRU information and replacement instructions are included with your machine and are available from IBM upon your request.

Table 3 lists the various warranty options for models of the TS2900 Tape Autoloader.

Table 3. Warranties and maintenance

IBM ServicePac®	TS2900 LTO-4 HH tape drive	TS2900 LTO-5 HH tape drive
Warranty and maintenance option		
3 Year Onsite Exchange 24x7 4 Hour Response	96P2905	91Y6413
3 Year Onsite Exchange 9x5 Next Business Day	96P2904	91Y6412
5 Year Onsite Exchange 24x7 4 Hour Response	29R5166	91Y6411
Maintenance agreement		
1 Year Onsite Exchange 24x7 4 Hour Response	44J8933	91Y6415
1 Year Onsite Exchange 9x5 Next Business Day	44J8932	91Y6414
2 Year Onsite Exchange 24x7 4 Hour Response	44J8935	91Y6417
2 Year Onsite Exchange 9x5 Next Business Day	44J8934	91Y6416
Remote technical support		
RTS for Tape Devices- 1yr	91Y8855	91Y8855
RTS for Tape Devices- 3yr	91Y8856	91Y8856

Note: Each ServicePac is country-specific and is valid only when purchased and registered in the country in which IBM service will be provided. Refer to the IBM ServicePac Worldwide Product Matrix at the following location for a complete list of the ServicePac part numbers that are specific to your country:

<https://www-304.ibm.com/sales/gss/download/spst/servicepac/extProductSelectorWWW.do>

Related publications

For more information, refer to the following resources:

- *IBM System Storage Product Guide*
<http://public.dhe.ibm.com/common/ssi/ecm/en/tso00364usen/TSO00364USEN.PDF>
- *IBM System Storage TS2900 Tape Autoloader Setup, Operator, and Service Guide*, GC27-2212
<http://www.ibm.com/shop/publications/order>
- *IBM System Storage TS2900 Tape Autoloader Installation Quick Reference Guide*, GA76-0423
<http://www.ibm.com/shop/publications/order>
- IBM Linear Tape-Open: LTO Ultrium tape drives, libraries, and autoloaders
<http://www.ibm.com/systems/storage/tape/lto/>
- *IBM System Storage Tape Library Guide for Open Systems*, SG24-5946
<http://www.redbooks.ibm.com/redbooks/pdfs/sg245946.pdf>
- IBM System Storage TS2900 Tape Autoloader Express
<http://www.ibm.com/systems/storage/tape/ts2900/>
- IBM LTO Ultrium 5 1.5 TB Data Cartridge
http://www.ibm.com/systems/storage/media/lto_5/index.html
- IBM Linear Tape File System
<http://www.ibm.com/systems/storage/tape/lufs/index.html>
- *IBM Systems and Technology data sheet: IBM Linear Tape File System*
<http://public.dhe.ibm.com/common/ssi/ecm/en/tsd03128usen/TSD03128USEN.PDF>

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