

Family 3555+01 IBM TS4300 tape library Models L3A and E3A

IBM United States Sales Manual
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Table of contents

- ↓

[Product life cycle dates](#)
- ↓

[Abstract](#)
- ↓

[Highlights](#)
- ↓

[Description](#)
- ↓

[Product positioning](#)
- ↓

[Models](#)

↓

[Technical description](#)

↓

[Publications](#)

↓

[Features](#)

↓

[Accessories](#)

↓

[Supplies](#)

Product life cycle dates

Type Model	Announced	Available	Marketing Withdrawn	Service Discontinued
3555-E3A	2017/07/25	2017/08/25	-	-
3555-L3A	2017/07/25	2017/08/25	-	-

[↑ Back to top](#)

Abstract

IBM TS4300 Tape Library is the next-generation storage solution designed to help mid-size enterprises respond to future challenges, including increasing data volume and cost of data center storage footprints, difficulty migrating data across vendor platforms, and increased complexity of IT training and management as staff resources shrink. The TS4300 Tape Library is an external 3U standalone or rack-mountable unit that incorporates Linear Tape-Open (LTO) IBM Ultrium 6, 7 and/or 8 Tape Drives.

Requirements for secure, long-term data retention, especially in the financial services, healthcare, and life sciences industries, are common and increasingly stringent, with data volumes growing massively as a result. Tape storage offers a less costly long-term storage option than disk drives or flash. Data stored on tape kept offline or on write-once media is nearly impossible to hack.

IBM TS4300 Tape Library helps support requirements for organizations that must provide secure, long-term storage for their data, enabling them to start with a 3U-high base library and scale to as many as seven modules, and to increase cartridge and drive capacity as needed, with a maximum capacity of 272 LTO Ultrium tape slots and 3.2 PB of native storage based on LTO 8.

LTO Ultrium 6 tape drives support the LTO Generation 6 media specification with the compressed capacity of up to 6.25 TB with 2.5:1 compression (up to 2.5 TB native capacity) per tape cartridge.

LTO Ultrium 7 tape drives support the LTO Generation 7 media specification of more than double the compressed capacity of up to 15 TB with 2.5 to 1 compression (up to 6 TB native capacity) when compared to LTO 6.

LTO Ultrium 8 tape drives support the LTO Ultrium 7 Type M media specification with compressed capacity of up to 22.5 TB with 2.5 to 1 compression (up to 9 TB native capacity)

LTO Ultrium 8 tape drives support the LTO Generation 8 media specification of more than double the compressed capacity of up to 30 TB with 2.5 to 1 compression (up to 12 TB native capacity) when compared to LTO 7.

The base module of the TS4300 tape library can accommodate either up to three Ultrium half-high tape drives with either SAS or Fibre type of attachment, one Ultrium full-high with Fibre type of attachment, or a combination of one Ultrium full-high plus one Ultrium half high tape drives. It can also hold up to 32 data cartridge slots in two

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removable magazines, including a standard five-cartridge I/O station. Other standard features include a 240 x 128 pixel monochrome graphic display with a front USB port, a 10/100/1000 Ethernet Port, and a high-speed barcode reader.

On its maximum configuration of one base module and six expansions, the TS4300 tape library can accommodate up to twenty-one Ultrium half-high tape drives, seven Ultrium full-high tape drives, or any combination of both based on the drive form factor (space needed for one full-height drive equals two half-height drives), and data cartridge slots.

Simplify tape storage deployment and management

TS4300 is based on an advanced control system to help speed deployment and simplify management. Best-in-class error recovery and reporting, library health monitoring and alerting, and auto-recovery features help to speed diagnostics and resolution. An internal Ethernet automation drive interface significantly increases drive communication speed for faster code updates and log downloads.

IBM offers diverse management software solutions for TS4300 to enhance the use of multipath architecture, as well as the use of a single TS4300 library. The library software includes API hooks that enable easy integration of IBM software.

Management software options

IBM Spectrum Archive: TS4300 leverages IBM Spectrum Archive for direct, intuitive and graphical access to data stored in IBM tape drives and libraries by incorporating the IBM Linear Tape File System (LTFS) format standard. LTFS compatibility allows tape-stored data to be accessed as if it were on disk or flash storage.

IBM Spectrum Archive enables users of LTO Ultrium 8, 7 and 6 tape library systems to inventory cartridges and read, write, and search data on any cartridge, enabling writing of metadata and tagging of individual files for easy and fast access to files stored on cartridges.

IBM Spectrum Protect: Spectrum Protect enables users to create, manage, and optimize archives, and provides management of concurrent copies of content, plus active, inactive, and off-site content.

Model abstract 3555-L3A

IBM TS4300 Tape Library machine type 3555 model L3A can be used as standalone unit or rack mountable unit, and can accommodate up to three Ultrium half-high tape drives with either SAS or Fibre type of attachment, one Ultrium full-high with Fibre type of attachment, or a combination of one Ultrium full-high plus one Ultrium half high tape drives. It can also hold up to 32 data cartridge slots in two removable magazines, including a standard five-cartridge I/O station. Other standard features include a 240 x 128 pixel monochrome graphic display with a front USB port, a 10/100/1000 Ethernet Port, and a high-speed barcode reader.

Model abstract 3555-E3A

IBM TS4300 Tape Library machine type 3555 model E3A is an expansion module that can be stacked with the base model on any standard customer supplied rack and allows significant growth by allowing up to 6 expansion modules to be added to the base library. Each expansion will add 40 slots of LTO cartridge capacity and can include an additional three half-height LTO drives or an additional one full-height drive plus one half-height LTO drive.

[↑ Back to top](#)

Highlights

IBM TS4300 Tape Library models L3A and E3A on machine type 3555 combine IBM enterprise tape automation reliability with open system affordability. Starting with one 3U base module (Model L3A) that can be used as standalone unit or rack mountable with up to six expansion modules (Model E3A) that can be stacked all in the same customer-supplied rack, the IBM TS4300 Tape Library delivers a highly scalable, easy-to-manage, and secure solution to meet long-term data storage requirements.

TS4300 is designed to deliver the following:

- High-density solution to help reduce the costs of data center space for storage and related utilities
- Tape storage capacity scaling as needed
- Ease of installation and management
- Error recovery and reporting, library health monitoring, and auto-recovery to rapidly remediate data storage issues
- Adherence to LTO Ultrium 8, LTO Ultrium 7 Type M media, LTO Ultrium 7 and LTO Ultrium 6 specifications
- Support for media partitioning and self-describing tape through IBM Spectrum Archive
- Data security and regulatory compliance through support for WORM media

As a scalable platform, TS4300 provides investment protection to enable customers to buy with confidence knowing that they can later expand by simply adding one or more expansion modules to keep up with growing, long-term storage requirements. IBM TS4300 utilizes 3U modules to meet the needs of entry and mid-range customers. Installation begins with a single, 3U base library and can grow to seven total modules with capacity of more than 270 LTO cartridges.

[↑ Back to top](#)

Description

IBM TS4300 Tape Library is the next-generation storage solution designed for the heavy demands of backup tape storage to help mid-size enterprises respond to future challenges. Requirements for secure, long-term data retention, especially in the financial services, healthcare and life sciences industries, are common and increasingly stringent, with data volumes growing massively as a result. Tape storage offers a less costly long-term storage option than disk drives or flash, and data stored on tape kept offline, or on write-once media, is almost impossible to hack.

IBM TS4300 Tape Library can be used as standalone, L3A model only, or rack mountable when expansions (E3A model) are added to the base. The modular design enables users to increase cartridge and drive capacity as needed, scaling vertically with up to seven modules (including the base library), with expansion for LTO Ultrium 8, Type M, 7 and 6 cartridges, drives, and redundant power supplies, and a single robot which manages all modules in the stack, allowing the library to run in sequential or random access mode.

IBM TS4300 Tape Library capacity is 272 tape cartridges, providing a media physical capacity up to 1.7 PB with 2.5:1 compression (up to 680 TB native capacity) data storage with LTO6, up to 4 PB with 2.5 to 1 compression (up to 1.6 PB native capacity) data storage with LTO 7 per unit and up to 8 PB with 2.5 to 1 compression (up to 3.2 PB native capacity) data storage with LTO 8 per unit.

IBM TS4300 Tape Library supports LTO 6, 7 and 8 hot-swappable drives, up to three half-height or one full-height drive plus one half-height drive with SAS or Fibre Channel attachment.

Model L3A (base module)

Model L3A can be installed and operate on its own, providing capacity for 32 LTO cartridges. The bottom row is not accessible when positioned as the bottom module (or the only module) due to mechanical limitations.

- **Removable cartridge magazines:** The TS4300 base module is configured to hold two removable magazines, one on the left side and one on the right side, holding 20 slots each for a total of 40 data cartridges. This enables quick population of the tape library, as well as ease of storage for media. You may order additional magazines as optional features to ease import/export tape cartridges on a regular basis.
Note: Capacity decreases to 32 data cartridges when the base module is the bottom module or the only module.
- **I/O station:** The front cartridge box of five slots in the right magazine will be considered as the I/O station box. The full group of five slots will be configurable as either import/export elements or as storage elements. This enables continuous library operation during import or export of data cartridges.
- **Media options:** Labeled or generic Ultrium media can be ordered at the time of purchase through the following feature codes, through the 3589 LTO Ultrium media machine type, or at the IBM Storage Media website.
 - 8806 Ultrium 8 Data Cartridge (5-pack)
 - 8706 Ultrium 7 Data Cartridge (5-pack)**Note:** Data cartridges are sold separately and subject to availability.
Or through the 3589 LTO Ultrium media machine type or [IBM Storage Media](#) website. Refer to the Supplies section for additional information.
- **Robotics:** The Base Library will include scaling robotics with a barcode reader for identifying, locating and moving LTO cartridges between storage locations and Drives.
- **Operator Panel:** The Base Library will include a Power button, 6 navigation buttons (left, right, up, down, enter, back) and a standard monochrome graphic display. The size of the display will be approximately 93 x 52 mm.
- **Standard interfaces:** The Base Library will include a USB host port on the front of the library and a 10/100/1000 Ethernet Port on the rear.
- **Power supplies:** Power supplies are rated 80 Plus Silver. Each module can run with a single power supply for non-redundant operation. An optional power supply will provide redundant operation. Power supplies will be hot swappable when 2 are installed in a single module.
- **CRUs (Customer Replacement Units):** Drive Sleds (Drive + Sled), Power Supply, Base Module Controller, Left and Right Magazines, Robotic Assembly, Elevator Cable Assembly (Spooling Mechanism), Base Library Chassis CRU.

Model E3A (expansion module)

The capacity of a base library can be increased by adding one or more 3U expansion modules. Each expansion will add 40 slots of LTO cartridge capacity and can include an additional three half-height LTO drives or an additional one full-height drive plus one half-height LTO drive.

The location of the base module within a library stack is limited due to the length of the spooling cable. A stacked library will support up to 3 Expansion Modules above and up to 3 Expansion Modules below the Base Library. A unit-to-unit locking mechanism ensures a proper alignment between units in a library stack.

- **Removable cartridge magazines:** The TS4300 expansion module is configured to hold two removable magazines, one on the left side and one on the right side holding 20 slots each for a total of 40 data

cartridges. You may order additional magazines as optional features to ease import/export tape cartridges on a regular basis.

- **I/O station:** The front cartridge box of five slots in the right magazine will be considered as the I/O station box. The full group of five slots will be configurable as either import/export elements or as storage elements. This enables continuous library operation during import or export of data cartridges.
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Note: Data cartridges are sold separately and subject to availability.

Or through the 3589 LTO Ultrium media machine type or [IBM Storage Media](#) website. Refer to the Supplies section for additional information.

- **Power supplies:** Power supplies are rated 80 Plus Silver. Each module can run with a single power supply for non-redundant operation. An optional power supply will provide redundant operation. Power supplies will be hot swappable when 2 are installed in a single module. When an Expansion Module is installed without drives, it will operate with no power supply installed.
- **CRUs (Customer Replacement Units):** Drive Sleds (Drive + Sled), Power Supply, Expansion Module Controller, Unit-to-unit cable, Left and Right Magazines, Expansion Module Chassis CRU.

TS4300 usability

The IBM TS4300 tape library is user installable, scalable, and serviceable. It includes best-in-class security and usability features, such as diagnostics that include library health monitoring, auto-recovery, and error recovery that will guide the user to diagnose the failure cause and identify the defective CRU.

Configuration, status, and logs on the main controller reside on a single SQL database and utilizes wizards for installation and configuration.

There are two interfaces for operating the IBM TS4300 Tape library:

- **Operator panel:** Is a PIN controlled interface accessible at the base module that provides the following functions:
 - Wizard for Initial System Setup
 - Configuration
 - Maintenance/Diagnostics
 - Operation-Status
- **Management GUI:** Is the primary interface with the tape library and consist on a web user interface, no client software is needed since it is web-based and all main browsers (Internet Explorer, Firefox, Safari, and Chrome) are supported with a common look and feel in all pages. Backend is PHP based with direct and fast access to the system database. IPv6 protocol is supported (IPv6 logo ready), as well as SSL/TLS (1.0-1.2) secured access. The web user interface provides the following sections:
 - Library Section
 - Drive Section
 - Cartridge Section
 - User Section
 - Settings Section

Access Levels for management

The TS4300 tape library has built-in user roles that can perform different functions:

- Administrator - The "Administrator" role has access to all menus except those menus that are restricted to Service only.
- Superuser - The "Superuser" role has access to most sections.
- Monitor - The "Monitor" role has viewing privileges to the unit, but is not able to make configuration changes.
- Service - Access to this level is for Service personnel only.

System configuration

System configuration is very simple starting with the initial configuration wizard that is available for quick installation. Configuration pages are context sensitive and only require valid and necessary parameters to configure. It is possible to save and restore system parameters. All configuration changes are tracked in log system, including timestamp and clear descriptions.

Initial wizard: Facilitates the initial system setup and includes all mandatory configuration items such as network setup, date/time, and administrator password.

Network configuration: All configuration options are included in one page without a need to reboot after a configuration change. Static addresses and DHCP are supported.

Drive configuration: All key parameters for drives are always visible in the headline, including the interface sensitive configuration parameters (SAS/FC). Reboot is not needed after a drive configuration change.

Library Inventory

After initialization of the entire library stack a full inventory scan is performed. The inventory scan includes all magazine slots, I/O station and drives. Every time magazine(s) or I/O station(s) have been removed and re-

inserted an inventory scan for this magazine or I/O station is performed.

Inventory information is shown in two ways:

- List view: This view includes the tape inventory list with details and modules can be grouped or ungrouped, specific drive/slots can be selected, and text can be filtered with a search box.
- Graphical view: Magazines are graphically represented with collapsible modules, including display of tape/drive details when moving over element.

Library Sharing

It is advantageous to be able to share a single physical library between heterogeneous or homogeneous applications. The TS4300 tape library can be partitioned into one or more logical libraries that can be shared by multiple applications. By using this concept, a host can only use the portion of the library assigned to it.

TS4300 can assign slots and drives to logical libraries, preventing unwanted access to slots/drives among different use cases. Also, multiple hosts can have independent access to the library without concurrency conflicts. The sizes for logical libraries are variable and the minimum assignment size is five slots (one magazine bank). Noncontiguous block assignments are allowed.

Libraries that contain at least two drives can configure two logical libraries. It is possible to configure up to 21 logical libraries in the library (up to the number of drives installed). With full-height or half-height physical drives, physical numbering is bottom up for all drives (A full-height drive can be installed in a module in the lower two slots only).

Configuration of a 1-logical library system: A one logical library system contains all drives present in any drive positions, and it contains all the slots.

Configuration of multiple logical libraries: A library with multiple logical libraries must have a drive for each logical library and at least one slot. Drives can be in any location in the library. It is best to have drives that are located near the slots that are assigned to the same logical library to minimize accessor movement and maximize performance.

Logical libraries can be easily created and maintained by using the wizard. They can be resized dynamically, and slot blocks and drives can get added or removed from an existing logical library. The existing layout with logical libraries can be easily viewed through the graphical interface.

Random and Sequential Logical Library modes

Each logical library on the TS4300 can be configured in one of two modes, random and sequential.

Random Mode is the default library mode, and is intended to be used by host applications that support SCSI media changer devices.

In Random mode,

- The host application chooses the cartridges that are moved to the drive.
- I/O slots provide the flexibility for the user to add and remove cartridges and the host application will be automatically notified of these changes.
- Multiple drives can be assigned to provide parallel processing data operations and redundancy in case of failure.

Sequential Mode is intended to be used by host applications that are not supporting SCSI media changer devices but need to get another cartridge loaded if the current cartridge is full.

In Sequential Mode,

- The library predefines the sequential order the cartridges are moved to the drive.
- I/O slots are hidden as they are not assignable to a logical library with sequential mode enabled.
- Only one drive can be assigned to a logical library with sequential mode enabled.
- There is no control path drive and there will be no media changer device configured to the host server.

System maintenance and diagnostics

TS4300 includes a best-in-class health system reporting, error logging, and recovery, including library health monitoring, alerts, and auto-recovery functions. The enhanced log and health system include event logs with critical, warning, and informational levels, event ticket system with user guidance, system tests, library software, and drive software upgrade.

Note: Firmware upgrades and log downloads are based on an internal Ethernet automation drive interface to increase drive communication speed.

Drive status

This includes general information and status in header line, detailed information about drive like firmware version, detailed FC and SAS port status information, as well as logical library assignment and library/module related status information.

LTO tape drives

The TS4300 tape library supports LTO 6 and later LTO tape drives. The following three generations of compatible LTO drives are supported by the TS4300 tape library: IBM Ultrium LTO 6, IBM Ultrium LTO 7, IBM Ultrium LTO 8 Fiber Channel and SAS drives (available in full-and half-height form factors). They are orderable with the following feature codes:

Description	Feature number
-----	-----
LTO 6 HH FIBRE CHANNEL DRIVE	AGKF
LTO 6 HH SAS DRIVE	AGKG
LTO 6 FH FIBRE CHANNEL DRIVE	AGKH
LTO 7 HH FIBRE CHANNEL DRIVE	AGKJ
LTO 7 HH SAS DRIVE	AGKK
LTO 7 FH FIBRE CHANNEL DRIVE	AGKL
LTO 8 HH FIBRE CHANNEL DRIVE	AGKM
LTO 8 HH SAS DRIVE	AGKN
LTO 8 FH FIBRE CHANNEL DRIVE	AGKP

LTO tape drives read and write non-WORM media, so you can load WORM-capable firmware on your tape drives and use any media that is supported by these drives. In this case, only the data that is written on WORM media is treated as WORM data. Data that is written on other types of media can be overwritten.

LTO tape drives can read tapes that were written by non-IBM LTO drives. They also write to tapes that can be read by non-IBM LTO drives.

To ensure that your tape drive conforms to IBM specifications for reliability, use only IBM LTO tape cartridges.

Ultrium LTO 8 IBM LTO Ultrium 8 tape drive is the seventh-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products.

Ultrium LTO 7 IBM LTO Ultrium 7 tape drive is the seventh-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products.

Ultrium LTO 6

IBM LTO Ultrium 6 tape drive is the sixth-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be found on the [IBM Accessibility](#) website.

[↑ Back to top](#)

Product positioning

TS4300 should be marketed against low end and mid-range tape libraries in the marketplace either in LTO format, or other DLT/SDLT, 4mm, DAT, VXA tape formats. TS4300 should also be sold into open systems environments that require dedicated tape backup for either single server/workstations or SAN environments.

In a seven-module configuration, IBM TS4300 is an external, stand-alone, or rack mountable entry-level and scalable tape library with a mid-range feature set and is targeted for environments needing capacities of up to 272 LTO cartridges and 21 half-height LTO drives for the heavy demands of backup tape storage.

As you compare competitive tape solutions, consider:

- Library scalability with one base module, up to seven expansion modules, and up to three tape drives per module (up to six expansion modules in addition to the base)
- Capacity, performance, and library management requirements
- Data protection, reliability, and availability
- Storage usage and application requirements
- Affordability
- Loyalty to LTO drive technology
- Server attachment and operating system support

The TS4300 tape library and related software applications excel in addressing these requirements and can constitute a functionally rich tape storage solution incorporating LTO Ultrium tape technology. It is designed to give clients flexibility of tape library management and unattended save and restore operations. A wizard for installation and configuration enables users to install, expand, and service the library without special training. The TS4300 Tape Library is an excellent solution if you use tape or require a larger-capacity or higher-performance tape backup with or without random access. The TS4300 Tape Library is an excellent choice for tape automation for IBM Power Systems, IBM System z, Linux, and Microsoft Windows servers.

Start with a base library

For organizations that must provide secure, long-term storage for their data, TS4300 enables them to start with a 3U-high base library and scale to as many as seven modules to increase cartridge and drive capacity as needed, with a maximum capacity of 272 LTO Ultrium tape slots and 3.2 PB of storage.

The TS4300 base library contains all the necessary robotics and intelligence to manage the base library system, with a maximum of 32 slots of LTO cartridge capacity on the base module, five I/O slots, and support for three combinations of full-and half-height (FH or HH) LTO drives per module. The TS4300 base library is rack or tabletop mountable. Module expansions are industry standard rack-mountable only.

Note: Each expansion module will include 40 slots

The capacity of a base library can be increased by adding one or more 3U expansion modules. Each expansion will add 40 slots of LTO cartridge capacity and can include an additional three half-height LTO drives or an additional one full-height drive plus one half-height LTO drive.

The TS4300, part of a family of IBM tape products, can be the answer to growing storage requirements and shrinking backup windows. If you require a highly scalable, easy-to-manage, and secure solution to meet long-term data storage requirements, the TS4300 Tape Library makes an excellent tape storage solution.

To help meet security and compliance requirements, the TS4300 supports WORM cartridges to enhance data protection.

For customers with lower capacity requirements than the TS4300 Tape Library deliver, the IBM TS2900 Tape Autoloader and the IBM TS2270 Tape Drive should be considered. For larger capacity requirements than the TS4300 Tape Library the IBM TS4500 Tape Library should be considered. Customers can tailor these tape libraries to match system capacity and performance needs.

[↑ Back to top](#)

Models

Model summary matrix

Model	Max Slot Capacity	I/O slots	Drive Capacity	Standard Interfaces
L3A	32	5	1 LTO FH or 3 LTO HH or 1 LTO FH + 1 LTO HH	10/100/1000 Ethernet Port, Front US
E3A	40	5	1 LTO FH or None; 3 LTO HH or 1 LTO FH + 1 LTO HH	-

Customer setup (CSU)

Yes.

Devices supported

For complete IBM storage interoperability information, including operating systems, servers, switches, and adapters supported by the TS4300 tape library in a SAN configuration, go to the IBM Storage Interoperation Center (SSIC) or contact your IBM sales representative.

Model conversions

Not available.

[↑ Back to top](#)

Technical description

- [↓ Physical specifications](#)
- [↓ Hardware requirements](#)
- [↓ Operating environment](#)
- [↓ Software requirements](#)
- [↓ Limitations](#)

IBM TS4300 Tape Library is the next-generation storage solution designed for the heavy demands of backup tape storage to help mid-size enterprises respond to future challenges. Requirements for secure, long-term data retention, especially in the financial services, healthcare and life sciences industries, are common and increasingly stringent, with data volumes growing massively as a result. Tape storage offers a less costly long-term storage option than disk drives or flash, and data stored on tape kept offline, or on write-once media, is almost impossible to hack.

IBM TS4300 Tape Library can be used as standalone, L3A model only, or rack mountable when expansions (E3A model) are added to the base. The modular design enables users to increase cartridge and drive capacity as needed, scaling vertically with up to seven modules (including the base library), with expansion for LTO Ultrium 8, Type M media, 7 and 6 cartridges, drives, and redundant power supplies, and a single robot which manages all modules in the stack, allowing the library to run in sequential or random access mode.

IBM TS4300 Tape Library capacity is 272 tape cartridges, providing a media physical capacity up to 1.7 PB with 2.5:1 compression (up to 680 TB native capacity) data storage with LTO6, up to 4 PB with 2.5 to 1 compression (up to 1.6 PB native capacity) data storage with LTO 7 per unit and up to 8 PB with 2.5 to 1 compression (up to 3.2 PB native capacity) data storage with LTO 8 per unit

IBM TS4300 Tape Library supports LTO 6, 7, and 8 hot-swappable drives, up to three half-height or one full-height drive plus one half-height drive with SAS or Fibre Channel attachment.

Model L3A (base module)

Model L3A can be installed and operate on its own, providing capacity for 32 LTO cartridges. The bottom row is not accessible when positioned as the bottom module (or the only module) due to mechanical limitations.

- **Removable cartridge magazines:** The TS4300 base module is configured to hold two removable magazines, one on the left side and one on the right side, holding 20 slots each for a total of 40 data cartridges. This enables quick population of the tape library, as well as ease of storage for media. You may order additional magazines as optional features to ease import/export tape cartridges on a regular basis.
Note: Capacity decreases to 32 data cartridges when the base module is the bottom module or the only module.
- **I/O station:** The front cartridge box of five slots in the right magazine will be considered as the I/O station box. The full group of five slots will be configurable as either import/export elements or as storage elements. This enables continuous library operation during import or export of data cartridges.
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- **Operator Panel:** The Base Library will include a Power button, 6 navigation buttons (left, right, up, down, enter, back) and a standard monochrome graphic display. The size of the display will be approximately 93 x 52 mm.
- **Standard interfaces:** The Base Library will include a USB host port on the front of the library and a 10/100/1000 Ethernet Port on the rear.
- **Power supplies:** Power supplies are rated 80 Plus Silver. Each module can run with a single power supply for non-redundant operation. An optional power supply will provide redundant operation. Power supplies will be hot swappable when 2 are installed in a single module.
- **CRUs (Customer Replacement Units):** Drive Sleds (Drive + Sled), Power Supply, Base Module Controller, Left and Right Magazines, Robotic Assembly, Elevator Cable Assembly (Spooling Mechanism), Base Library Chassis CRU.

Model E3A (expansion module)

The capacity of a base library can be increased by adding one or more 3U expansion modules. Each expansion will add 40 slots of LTO cartridge capacity and can include an additional three half-height LTO drives or an additional one full-height drive plus one half-height LTO drive.

The location of the base module within a library stack is limited due to the length of the spooling cable. A stacked library will support up to 3 Expansion Modules above and up to 3 Expansion Modules below the Base Library. A unit-to-unit locking mechanism ensures a proper alignment between units in a library stack.

- **Removable cartridge magazines:** The TS4300 expansion module is configured to hold two removable magazines, one on the left side and one on the right side holding 20 slots each for a total of 40 data cartridges. You may order additional magazines as optional features to ease import/export tape cartridges on a regular basis.
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- **Power supplies:** Power supplies are rated 80 Plus Silver. Each module can run with a single power supply for non-redundant operation. An optional power supply will provide redundant operation. Power supplies will

be hot swappable when 2 are installed in a single module. When an Expansion Module is installed without drives, it will operate with no power supply installed.

- **CRUs (Customer Replacement Units):** Drive Sleds (Drive + Sled), Power Supply, Expansion Module Controller, Unit-to-unit cable, Left and Right Magazines, Expansion Module Chassis CRU.

TS4300 usability

The IBM TS4300 tape library is user installable, scalable, and serviceable. It includes best-in-class security and usability features, such as diagnostics that include library health monitoring, auto-recovery, and error recovery that will guide the user to diagnose the failure cause and identify the defective CRU.

Configuration, status, and logs on the main controller reside on a single SQL database and utilizes wizards for installation and configuration.

There are two interfaces for operating the IBM TS4300 Tape library:

- **Operator panel:** Is a PIN controlled interface accessible at the base module that provides the following functions:
 - Wizard for Initial System Setup
 - Configuration
 - Maintenance/Diagnostics
 - Operation-Status
- **Management GUI** Is the primary interface with the tape library and consist on a web user interface, no client software is needed since it is web-based and all main browsers (Internet Explorer, Firefox, Safari, and Chrome) are supported with a common look and feel in all pages. Backend is PHP based with direct and fast access to the system database. IPv6 protocol is supported (Ipv6 logo ready), as well as SSL/TLS (1.0-1.2) secured access. The web user interface provides the following sections:
 - Library Section
 - Drive Section
 - Cartridge Section
 - User Section
 - Settings Section

Access Levels for management

The TS4300 tape library has built-in user roles that can perform different functions:

- Administrator - The "Administrator" role has access to all menus except those menus that are restricted to Service only.
- Superuser - The "Superuser" role has access to most sections.
- Monitor - The "Monitor" role has viewing privileges to the unit, but is not able to make configuration changes.
- Service - Access to this level is for Service personnel only.

System configuration

System configuration is very simple starting with the initial configuration wizard that is available for quick installation. Configuration pages are context sensitive and only require valid and necessary parameters to configure. It is possible to save and restore system parameters. All configuration changes are tracked in log system, including timestamp and clear descriptions.

Initial wizard: Facilitates the initial system setup and includes all mandatory configuration items such as network setup, date/time, and administrator password.

Network configuration: All configuration options are included in one page without a need to reboot after a configuration change. Static addresses and DHCP are supported.

Drive configuration: All key parameters for drives are always visible in the headline, including the interface sensitive configuration parameters (SAS/FC). Reboot is not needed after a drive configuration change.

Library Inventory

After initialization of the entire library stack a full inventory scan is performed. The inventory scan includes all magazine slots, I/O station and drives. Every time magazine(s) or I/O station(s) have been removed and re-inserted an inventory scan for this magazine or I/O station is performed.

Inventory information is shown in two ways:

- List view: This view includes the tape inventory list with details and modules can be grouped or ungrouped, specific drive/slots can be selected, and text can be filtered with a search box.
- Graphical view: Magazines are graphically represented with collapsible modules, including display of tape/drive details when moving over element.

Library Sharing

It is advantageous to be able to share a single physical library between heterogeneous or homogeneous applications. The TS4300 tape library can be partitioned into one or more logical libraries that can be shared by multiple applications. By using this concept, a host can only use the portion of the library assigned to it.

TS4300 can assign slots and drives to logical libraries, preventing unwanted access to slots/drives among different use cases. Also, multiple hosts can have independent access to the library without concurrency conflicts. The sizes for logical libraries are variable and the minimum assignment size is five slots (one magazine bank). Noncontiguous block assignments are allowed.

Libraries that contain at least two drives can configure two logical libraries. It is possible to configure up to 21 logical libraries in the library (up to the number of drives installed). With full-height or half-height physical drives, physical numbering is bottom up for all drives (A full-height drive can be installed in a module in the lower two slots only).

Configuration of a 1-logical library system: A one logical library system contains all drives present in any drive positions, and it contains all the slots.

Configuration of multiple logical libraries: A library with multiple logical libraries must have a drive for each logical library and at least one slot. Drives can be in any location in the library. It is best to have drives that are located near the slots that are assigned to the same logical library to minimize accessor movement and maximize performance.

Logical libraries can be easily created and maintained by using the wizard. They can be resized dynamically, and slot blocks and drives can get added or removed from an existing logical library. The existing layout with logical libraries can be easily viewed through the graphical interface.

Random and Sequential Logical Library modes

Each logical library on the TS4300 can be configured in one of two modes, random and sequential.

Random Mode is the default library mode, and is intended to be used by host applications that support SCSI media changer devices.

In Random mode,

- The host application chooses the cartridges that are moved to the drive.
- I/O slots provide the flexibility for the user to add and remove cartridges and the host application will be automatically notified of these changes.
- Multiple drives can be assigned to provide parallel processing data operations and redundancy in case of failure.

Sequential Mode is intended to be used by host applications that are not supporting SCSI media changer devices but need to get another cartridge loaded if the current cartridge is full.

In Sequential Mode,

- The library predefines the sequential order the cartridges are moved to the drive.
- I/O slots are hidden as they are not assignable to a logical library with sequential mode enabled.
- Only one drive can be assigned to a logical library with sequential mode enabled.
- There is no control path drive and there will be no media changer device configured to the host server.

System maintenance and diagnostics

TS4300 includes a best-in-class health system reporting, error logging, and recovery, including library health monitoring, alerts, and auto-recovery functions. The enhanced log and health system include event logs with critical, warning, and informational levels, event ticket system with user guidance, system tests, library software, and drive software upgrade.

Note: Firmware upgrades and log downloads are based on an internal Ethernet automation drive interface to increase drive communication speed.

Drive status

This includes general information and status in header line, detailed information about drive like firmware version, detailed FC and SAS port status information, as well as logical library assignment and library/module related status information.

LTO tape drives

The TS4300 tape library supports LTO 6 and later LTO tape drives. The following three generations of compatible LTO drives are supported by the TS4300 tape library: IBM Ultrium LTO 6, IBM Ultrium LTO 7, IBM Ultrium LTO 8 Fiber Channel and SAS drives (available in full-and half-height form factors). They are orderable with the following feature codes:

Description	Feature number
-----	-----
LTO 6 HH FIBRE CHANNEL DRIVE	AGKF
LTO 6 HH SAS DRIVE	AGKG
LTO 6 FH FIBRE CHANNEL DRIVE	AGKH
LTO 7 HH FIBRE CHANNEL DRIVE	AGKJ
LTO 7 HH SAS DRIVE	AGKK
LTO 7 FH FIBRE CHANNEL DRIVE	AGKL

LTO 8 HH FIBRE CHANNEL DRIVE AGKM
 LTO 8 HH SAS DRIVE AGKN
 LTO 8 FH FIBRE CHANNEL DRIVE AGKP

LTO tape drives read and write non-WORM media, so you can load WORM-capable firmware on your tape drives and use any media that is supported by these drives. In this case, only the data that is written on WORM media is treated as WORM data. Data that is written on other types of media can be overwritten.

LTO tape drives can read tapes that were written by non-IBM LTO drives. They also write to tapes that can be read by non-IBM LTO drives.

To ensure that your tape drive conforms to IBM specifications for reliability, use only IBM LTO tape cartridges.

Ultrium LTO 8 IBM LTO Ultrium 8 tape drive is the seventh-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products.

Ultrium LTO 7 IBM LTO Ultrium 7 tape drive is the seventh-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products.

Ultrium LTO6

IBM LTO Ultrium 6 tape drive is the sixth-generation LTO Ultrium tape drive in the IBM LTO Ultrium family of products.

Physical specifications

Library layout and location requirements

For tabletop installation: Tabletop installations (one base module) require no additional hardware.

For rackmount installation: If possible, install the base module in the middle of the rack to provide space for the allowed three expansion modules above it and three expansion modules below it.

Location requirements

Rack requirements: Standard 19-inch rack (minimum depth of 1 meter) with an appropriate number or rack units (Us) of clearance for the planned module quantity.

Rack space requirements: 3U for the base module and 3U for each expansion module.

Power source:

- AC Power Voltage: 100 - 240 V AC
- Line Frequency: 50 - 60 Hz
- Library is located near AC outlet

The AC power cord must be always easily accessible.

Air quality:

- Place the library in an area with minimal sources of particulate contamination.
- Avoid areas near frequently used doors and walkways, stacks of supplies that collect dust, printers, and smoke-filled rooms.
- Excessive dust and debris can damage tapes and tape drive.

Physical characteristics of TS4300 Tape Library models L3A / E3A

- Height 133 mm (5.23 in)
- Width 480 mm (18.89 inches)
- Depth 873 mm (34.37 in)
- Minimum Weight (with no tape drives or cartridges)
 - Base Model L3A 21 kg (46.3 lb)
 - Expansion Model E3A 13 kg (28.7 lb)
- Maximum weight (with maximum tape drives)(1):
 - Base Model L3A 28 kg (61.5 lb)
 - Expansion Model E3A 22.6 kg (49.6 lb)

Note: (1) The weight with drives assumes a weight of 2.3 kg (5 lb) for a LTO 7 HH FC tape drive. The actual weight of the modules varies, depending on the configuration.

Operating environment

Equipment environment specifications for IBM TS4300 Tape Library:

- Allowable temperature: 15°C to 32°C (60°F to 90°F). Recommended: 16°C to 25°C (60.8°F to 77°F).
- Maximum Wet bulb temperature: 26°C (78.8°F)
- Allowable Relative humidity: 20% - 80% noncondensing. Recommended: 20% - 50% noncondensing.
- Electrical power: 3.5 to 5.0 amps at 100-240 V AC 50/60 Hz, 350 W.

TS4300 tape libraries are classified as Category 1 products as defined in C-S 1-1710-006.

For more information and documentation, see the [TS4300](#) page in IBM Knowledge Center.

Limitations

The TS4300 tape library supports a mixture of LTO drive types in a logical library. For situations where the ISV support does not exist or does not meet your requirements, the TS4300 tape library provides another option to protect your investment by partitioning the tape drives into separate logical libraries. You can customize the logical libraries to any number of slots by using menus.

- Although the compression technology can increase the amount of data stored on the media, the actual degree of compression achieved is highly sensitive to the characteristics of the data being compressed.
- Although multiple systems may be attached to a tape drive, the systems cannot use the drive simultaneously.
- SAS cable lengths are limited to a maximum of 6 meters (20 feet).
- With a data rate of 8 Gbps, Fibre Channel cable lengths are limited to 150 meters (492 feet) using an OM3 cable.

Hardware requirements

TS4300 tape library models L3A and E3A

TS4300 models L3A and E3A support the Ultrium 6, Ultrium 7 and Ultrium 8 half-high SAS and Fibre Channel and full-high Fibre Channel tape drives and can be attached to IBM Power Systems, AIX, Linux, and Windows servers, and non-IBM servers, workstations, and personal computers that support those interface specifications.

One base module L3A and up to six expansion modules E3A are designed to provide up to 272 cartridge slots for LTO media.

TS4300 L3A comes with one power supply and an additional power supply can be added with feature number 1900, **Additional Power Supply**. If ordered as an option, the additional power supply will require a power cord. If the Additional Power Supply feature is ordered, then two power cords will be required. A power cord feature number should also be specified.

TS4300 E3A comes without a power supply and the first power supply can be added with feature number 1899, **First Power Supply**. If ordered, the power cord feature is required. If FC 1900 **Additional Power Supply** is ordered, then two power cords will be required. A power cord feature number should also be specified.

TS4300 tape library models L3A and E3A can contain a maximum of three half-height or one full-height and one half-height LTO Ultrium Fibre Channel Tape Drives per module for a total of up to 21 half-height or seven full-height per library stack.

Labeled or bulk quantities of LTO cartridges can be ordered using machine type 3589 or purchased through distributors. Refer to the Supplies section for additional information.

Note: The TS4300 tape library requires that cartridges have appropriate bar code labels.

Cables:

Cables are required to attach tape drives in the TS4300 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 TS4300.

Fibre Channel cables: A Fibre Channel cable is required to attach a TS4300 Tape Library with Fibre Channel Ultrium tape drives to host Fibre Channel adapters, Fibre Channel switches, or other Fibre Channel components. The IBM Ultrium 6 or 7 or 8 (8 Gbps) Fibre drive comes with an LC duplex connector.

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

- 10-meter OM3 fiber Cable (LC) (feature #AGK1)
- 25-meter OM3 fiber Cable (LC) (feature #AGK2)

SAS cables: A SAS cable is required to attach a TS4300 to the server host bus SAS adapter. Mini-SAS HD/Mini-SAS cables provide attachment from HBA with SFF-8644 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 m Mini-SAS/Mini-SAS 1x Cable (from HBA with SFF-8088 to drive with SFF-8088) (feature #5502)
- 4 m Mini-SAS HD/ Mini-SAS 1x Cable (from HBA with SFF-8644 to drive with SFF-8088) (feature #5507)
- 3 m Mini-SAS HD/ Mini-SAS 2x Cable (from HBA with SFF-8644 to two drives with SFF-8088) (feature #5509)

SAS Interposers

A 1x4 interposer with 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 number 5502) connects the interposer to the drive, and needs to be ordered separately.

The following interposer is available:

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

LTO Ultrium Tape Drives in the TS4300 tape library

For the latest supported hardware interoperability configurations, refer to the [Interoperation Center](#) website .

Select the Midrange category, then click on "Learn More" under TS4300 model, then click on the **Details** tab, then click on "See a complete list of software requirements".

The installation of a TS4300 Tape Library may require code updates for supported open systems device drivers or storage management software.

Note: All new IBM tape device drivers will only be posted to the web through the Fix Central download portal and not through the ftp site. 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.

There are several menus to navigate to the correct download as follows:

- 1. Click on **Select Product** Tab
- 2. On the first menu item Click **Select Product > Product Group > System Storage**
- 3. Expand **Select from System Storage > Tape Systems**
- 4. Expand **Select from Tape systems > Tape drivers and software**
- 5. Expand **Select from Tape drivers and software > user product**
- 6. Expand **Platform > user operating system**
- 7. Click **Continue** to view what drivers are available

The **IBM Tape Device Drivers Installation and User's Guide** can be found at [IBM support](#) website.

Application software

For a current list of host software versions and release levels that support the TS4300 tape library, visit the [Independent Software Vendor \(ISV\) matrix for LTO](#) for the product.

Spectrum Protect and other compatible software offerings can provide storage and tape management software for the TS4300. Supporting software and applications must be obtained separately from IBM, IBM Business Partners, or ISVs.

IBM continues to work with ISVs to support the TS4300 tape library. For specific information and availability dates, contact the application vendor.

↑ [Back to top](#)

Publications

Information about new features are contained in the following TS4300 Tape Library publications. Additional copies are available. To order, contact your IBM representative.

Title	Order number
IBM TS4300 Tape Library Getting Started Guide	SC27-4630-00
IBM TS4300 Tape Library User's Guide	SC27-4629-00
IBM TS4300 Product information CD	00GH794

Additional information is available at the [IBM Publications Center](#) .

Additional planning information is available at [Fix Central](#) or [TS4300 Knowledge Center](#) .

IBM Knowledge Center provides you with a single point of reference where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access by going to [IBM Knowledge Center](#) for all your product information needs.

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[↑ Back to top](#)

Features

[↓ Features - No charge](#)[↓ Features - Chargeable](#)[↓ Feature descriptions](#)[↓ Feature exchanges](#)

Features - No charge

Description	Machine type	Model	Feature number
TAA Compliant	3555	L3A, E3A	0983
OEM no IBM logo	3555	L3A, E3A	7703
Ultrium M8 5 Pack Data Labels	3555	L3A, E3A	8807
First Expansion unit	3555	L3A	9002
Second Expansion unit	3555	L3A	9003
Third Expansion unit	3555	L3A	9004
Fourth Expansion unit	3555	L3A	9005
Fifth Expansion unit	3555	L3A	9006
Sixth Expansion unit	3555	L3A	9007
Attached to Sun Solaris	3555	L3A	9211
Attached to Windows System	3555	L3A	9212
Attached to Other Non-IBM Systems	3555	L3A	9213
Attached to Linux System	3555	L3A	9215
Attached to z-Series Linux System	3555	L3A	9216
Attached to i5/OS or OS/400 System	3555	L3A	9400
Attached to IBM AIX System	3555	L3A	9600
No Host/SAN Cable from Plant	3555	L3A, E3A	9700
New order install	3555	E3A	9906
Shipping and Handling NC	3555	L3A, E3A	AG00
TS4300 Select-3U Autom LTO6	3555	L3A	AGGY
TS4300 Select-3U Autom LTO7	3555	L3A	AGGZ
OEM 1 ORDER INDICATOR	3555	L3A, E3A	ACY1
OEM 1 FC ORDER INDICATOR	3555	L3A, E3A	ACW1
No Rules Order Indicator	3555	L3A, E3A	ADNR

Features - Chargeable

Description	Machine type	Model	Feature number
Fibre tape drive support	3555	L3A	1411
SAS tape drive support	3555	L3A	1412
Path Failover	3555	L3A	1682
First Power Supply	3555	E3A	1899
Additional Power Supply	3555	L3A, E3A	1900
Mini-SAS/Mini-SAS 4x Interposer	3555	L3A, E3A	5500
2 m Mini-SAS/Mini-SAS 1x Cable	3555	L3A, E3A	5502
4 m Mini-SAS HD/Mini-SAS 1x Cable	3555	L3A, E3A	5507
3 m Mini-SAS HD/Mini-SAS 2x Cable	3555	L3A, E3A	5509
LTO Lib Managed Encryption	3555	L3A	5900
Rack Mount Kit	3555	L3A, E3A	7002
LTO Cleaning Cartridge	3555	L3A, E3A	8002
Right Side Magazine w/logo	3555	L3A	8106
Left Side Magazine	3555	L3A	8109
Right Side Magazine no logo	3555	L3A	8116
Ultrium 6 Data Cartridge (5-Pack)	3555	L3A, E3A	8605
Ultrium 7 Data Cartridge (5-pack)	3555	L3A, E3A	8706
Ultrium 8 Data Cartridge (5-Pack)	3555	L3A, E3A	8806
2.8M Power Cord 125V US/Canada	3555	L3A, E3A	9800
2.8M Power Cord 250V France/Germany	3555	L3A, E3A	9820
2.8M Power Cord 250V Denmark	3555	L3A, E3A	9821
2.8M Power Cord 250V UK/China	3555	L3A, E3A	9825
2.8M Power Cord 250V Israel	3555	L3A, E3A	9827
2.8M Power Cord 250V Switzerland	3555	L3A, E3A	9828
2.8M Power Cord 250V S. Africa	3555	L3A, E3A	9829
2.8M Power Cord 250V Italy	3555	L3A, E3A	9830

Contact IBM

2.8M Power Cord 250V Australia	3555	L3A, E3A	9831
2.8M Power Cord 250V US/Canada	3555	L3A, E3A	9833
2.8M Power Cord 250V Uruguay/Argentina	3555	L3A, E3A	9834
2.8M Power Cord 125V Taiwan	3555	L3A, E3A	9835
2.8M Power Cord 250V China (PRC)	3555	L3A, E3A	9840
2.8M Power Cord 250V Taiwan	3555	L3A, E3A	9841
2.8M Power Cord 125V Japan	3555	L3A, E3A	9842
2.8M Power Cord 250V Korea	3555	L3A, E3A	9844
2.8M Power Cord 250V India	3555	L3A, E3A	9845
2.8M Power Cord 250V Brazil	3555	L3A, E3A	9847
Rack to PDU line cord	3555	L3A, E3A	9848
Shipping and Handling	3555	L3A	AGGJ
Shipping and Handling	3555	E3A	AGGK
10 meter OM3 fiber Cable (LC)	3555	L3A, E3A	AGK1
25 meter OM3 fiber Cable (LC)	3555	L3A, E3A	AGK2
LTO 6 HH Fibre channel drive	3555	L3A, E3A	AGKF
LTO 6 HH SAS Drive	3555	L3A, E3A	AGKG
LTO 6 FH Fibre channel drive	3555	L3A, E3A	AGKH
LTO 7 HH Fibre channel drive	3555	L3A, E3A	AGKJ
LTO 7 HH SAS Drive	3555	L3A, E3A	AGKK
LTO 7 FH Fibre channel drive	3555	L3A, E3A	AGKL
LTO 8 HH FIBRE CHANNEL DRIVE	3555	L3A, E3A	AGKM
LTO 8 HH SAS DRIVE	3555	L3A, E3A	AGKN
LTO 8 FH FIBRE CHANNEL DRIVE	3555	L3A, E3A	AGKP

Feature descriptions

(#0983) TAA Compliance

This feature indicates that product is TAA compliance.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: Feature #0983 is not available in India for use.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#1411) Fibre tape drive support

This feature provides a Fibre wrap tool. Only one Fibre wrap tool feature #1411 is required in a TS4300 Library. The wrap tool is used to isolate drive sled problems.

- Minimum Number of Features: None.
- Maximum Number of Features: Seven.
- Prerequisites: One Fibre wrap tool is required when the first (LTO 6 Half-High #AGKF) or (LTO 6 Full-High #AGKH) or (LTO 7 Half-High #AGKJ) or (LTO 7 Full-High #AGKL) or (LTO 8 Half-High #AGKM) or (LTO 8 Full-High #AGKP) Tape drive is ordered.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant and Field.

(#1412) SAS tape drive support

This feature provides a SAS wrap tool. Only one SAS wrap tool feature #1412 is required in a TS4300 Library. The wrap tool is used to isolate drive sled problems.

- Minimum Number of Features: None.
- Maximum Number of Features: Seven.
- Prerequisites: One SAS wrap tool is required when the first (LTO6 Half-High #AGKG) or (LTO 7 Half-High #AGKK) or (LTO8 Half-High #AGKN) Tape drive is ordered.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant and Field.

(#1682) Path Failover

This optional feature is designed to provide automatic control path failover and data path failover for tape drives in the Tape Library. The control path failover is designed to provide automatic control path failover to a pre-configured redundant control path in the event of a loss of a host adapter or control path drive, without aborting

the current job in progress. The data path failover is designed to provide a failover mechanism for configuring multiple redundant paths in a SAN environment. In the event of a path or component failure, the failover mechanism is designed to automatically re-try the current operation using an alternate, preconfigured path without aborting the current job in progress. This helps provide flexibility in SAN configuration, availability, and management.

- Minimum number of features: None
- Maximum number of features: One
- Prerequisites: None
- Installation: Plant or Field
- Limitations: None.

First Power Supply

(#1899) First Power Supply

This feature provides the first power supply required when one of the drive features is ordered. A single power cord of a specified power cord feature is provided when this feature is ordered.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#1900) Additional Power Supply

This feature provides an additional power supply to allow connection to two independent branch circuits. Two power cords, instead of a single power cord, of the specified power cord are provided when this feature is ordered.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: Model E3A must have feature #1899
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#5500) Mini-SAS/Mini-SAS 4x Interposer

This feature provides 1 by 4 Interposer with Mini-SAS/Mini-SAS connections for connecting up to four Mini-SAS/Mini-SAS 1x cables and the associated SAS drives to host a single bus adapter port. Mini-SAS/Mini-SAS 1x cables, to connect the interposer to the drive, need to be ordered separately.

- Minimum Number of Features: None.
- Maximum Number of Features: 99.
- Prerequisites: Mutually exclusive with feature #9700.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#5502) 2.0 Meter Mini-SAS/Mini-SAS 1X Cable

Cable with Mini-SAS (SFF-8088) connectors on each end.

Note: For Full height drives, up to two cables can be used.

- Minimum Number of Features: None.
- Maximum Number of Features: 99.
- Prerequisites: Mutually exclusive with feature #9700.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#5507) 4m Mini-SAS HD/Mini-SAS 1X Cable

4 meters Mini-SAS HD to Mini-SAS cable for attachment of a single Tape Drive (from HBA with SFF-8644 to drive with SFF-8088).

Note: For Full height drives, up to two cables can be used.

- Minimum Number of Features: None.
- Maximum Number of Features: 99.
- Prerequisites: Mutually exclusive with feature #9700.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant and Field.

(#5509) 3m Mini-SAS HD/Mini-SAS 2X Cable

3 meters Mini-SAS HD to Mini-SAS cable for attachment of one or two Tape Drives (from HBA with SFF-8644 to drive with SFF-8088).

Note: A SAS external cable may also be ordered as a second cable for linking to another SAS device.

- Minimum Number of Features: None.
- Maximum Number of Features: 99.
- Prerequisites: Mutually exclusive with feature #9700.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant and Field.

(#5900) LTO Library Managed Encryption

This feature enables Library Managed Encryption on the Tape Library.

- Feature Type: Chargeable
- Required Feature: No
- Minimum number of features: None
- Maximum number of features: One
- Initial order only: No
- Installation: Plant or Field

(#7002) Rack Mount Kit

This feature provides the necessary hardware to mount the TS4300 Tape Library in a standard 19-inch EIA equipment rack. Three EIA units are required. Feature (#9848) Rack to PDU Line Cord must be ordered. Feature #7002 is mandatory for model E3A.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: One feature #9848 is required with feature #7002. When feature #9002 is present, feature #7002 will be added to Model L3A
- Corequisites: Model E3A
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#7703) OEM - NO IBM LOGO

This feature directs the plant to ship the TS4300 Tape Library without "IBM" or "System Storage" logos on the covers.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#8002) LTO Cleaning Cartridge

This feature provides one cleaning cartridge, used to clean the Ultrium Tape Drives.

- Minimum Number of Features: None.
- Maximum Number of Features: 5.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.

- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#8106) Right Side Magazine with logo

This feature provides one additional removable right side 20-cartridge magazine with an IBM logo.

- Minimum Number of Features: None.
- Maximum Number of Features: Two.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: FC #8106 and #8116 are mutually exclusive.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#8109) Left Side Magazine

This feature provides one additional removable left side 20-cartridge magazine for a TS4300 Tape Library.

- Minimum Number of Features: None.
- Maximum Number of Features: Two.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#8116) Right Side Magazine no logo

This feature provides one additional removable right side 20-cartridge magazine with no IBM logo.

- Minimum Number of Features: None.
- Maximum Number of Features: Two.
- Prerequisites: Requires FC #7703
- Corequisites: None.
- Compatibility conflicts: FC #8106 and #8116 are mutually exclusive.
- Limitations: When feature ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#8605) Ultrium 6 Data Cartridges (5-pack)

This feature provides five unlabeled 2.5 TB data cartridges for use with the TS4300 tape drive.

- Minimum Number of Features: None.
- Maximum Number of Features: 10.
- Prerequisites: None..
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 are present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#8706) Ultrium 7 Data Cartridges (5-pack)

This feature provides five unlabeled 6 TB data cartridges for use with the TS4300 tape drive.

- Minimum Number of Features: None.
- Maximum Number of Features: 10.
- Prerequisites: None..
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 are present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#8806) Ultrium 8 Data Cartridges (5-pack)

(No longer available as of April 23, 2019)

This feature provides five unlabeled 12 TB data cartridges for use with the LTO 8 tape drive.

- Minimum number of features: None

- Maximum number of features: 10
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable
- Installation: Plant Only

(#8807) Ultrium M8 5 Pack Data Labels

This feature provides five M8 data labels for use with LTO 7 data cartridges.

- Feature type: No Charge
- Required feature: Feature #8706
- Minimum number of features: None
- Maximum number of features: 10
- Installation: Plant only
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable

(#9002) First Expansion Unit

This feature notifies the plant that a Model E3A Expansion Unit is attached to the Model L3A.

Note: A model E3A also needs to be on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites:
 - Model E3A.
 - Feature #7002 is required for feature #9002
- Compatibility conflicts: None.
- Limitations: Mutually exclusive with ACY1.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#9003) Second Expansion Unit

This feature notifies the plant that a Model E3A Expansion Unit is attached to the Model L3A.

Note: A model E3A also needs to be on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: Requires FC #9002.
- Corequisites: Model E3A.
- Compatibility conflicts: None.
- Limitations: Mutually exclusive with ACY1.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#9004) Third Expansion Unit

This feature notifies the plant that a Model E3A Expansion Unit is attached to the Model L3A.

Note: A model E3A also needs to be on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: Requires FC #9003.
- Corequisites: Model E3A.
- Compatibility conflicts: None.
- Limitations: Mutually exclusive with ACY1.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#9005) Fourth Expansion Unit

This feature notifies the plant that a Model E3A Expansion Unit is attached to the Model L3A.

Note: A model E3A also needs to be on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: Requires FC #9004.
- Corequisites: Model E3A.
- Compatibility conflicts: None.
- Limitations: Mutually exclusive with ACY1.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#9006) Fifth Expansion Unit

This feature notifies the plant that a Model E3A Expansion Unit is attached to the Model L3A.

Note: A model E3A also needs to be on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: Requires FC #9005.
- Corequisites: Model E3A.
- Compatibility conflicts: None.
- Limitations: Mutually exclusive with ACY1.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#9007) Sixth Expansion Unit

This feature notifies the plant that a Model E3A Expansion Unit is attached to the Model L3A.

Note: A model E3A also needs to be on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: Requires FC #9006.
- Corequisites: Model E3A.
- Compatibility conflicts: None.
- Limitations: Mutually exclusive with ACY1.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

System Attachment

The following specify codes indicate the type of server to which the TS4300 Tape Library is attached:

(#9211) Attached to Sun Solaris

(No Longer Available as of March 17, 2018)(For Model L3A)

(#9212) Attached to Windows System

(#9213) Attached to other non-IBM Systems

(#9215) Attached to Linux System

(#9216) Attached to z-Series Linux System

(No Longer Available as of March 17, 2018)(For Model L3A)

(#9400) Attached to i5/OS or OS/400 System

(#9600) Attached to IBM AIX System

The following attributes apply to the system attachment codes listed above:

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#9700) No Host/SAN Cable from Plant

This feature must be placed on any TS4300 Tape Library shipping from the plant with no host attachment cables specified when a tape drive is ordered on the module. When this feature is on the order, the plant will not include any Fibre Channel tape drive host attachment cables with the shipment of this TS4300 Tape Library. Any required cables must be supplied by the customer.

- Minimum Number of Features: None.
- Maximum Number of Features: None.
- Prerequisites: Mutually exclusive with features #AGK1, #AGK2, #5500, #5502, #5507, and #5509.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

Power Cords

One of the following power cords must be selected:

(#9800) 2.8 m Power Cord, 125 V, 15 A, US/Canada

(#9820) 2.8 m Power Cord, 250 V, 16 A, France, Germany, & others

(#9821) 2.8 m Power Cord, 250 V, 11 A, Denmark

(#9825) 2.8 m Power Cord, 250 V, 13 A, United Kingdom, China, & others

- (#9827) 2.8 m Power Cord, 250 V, 6-16 A, Israel**
- (#9828) 2.8 m Power Cord, 255 V, 10 A, Switzerland**
- (#9829) 2.8 m Power Cord, 250 V, 16 A, South Africa**
- (#9830) 2.8 m Power Cord, 250 V, 10 & 16 A, Italy**
- (#9831) 2.8 m Power Cord, 250 V, 10 A, Australia**
- (#9833) 2.8 m Power Cord, 250 V, 15 A, US/Canada**
- (#9834) 2.8 m Power Cord, 250 V, 10 A, Uruguay**
- (#9835) 2.8 m Power Cord, 125V, 10 A, Taiwan**
- (#9840) 2.8 m Power Cord, 250 V, 10 A, China**
- (#9841) 2.8 m Power Cord, 250V, 10 A, Taiwan**
- (#9842) 2.8 m Power Cord, 125V, 12 A, Japan**
- (#9844) 2.8 m Power Cord, 250V, 12 A, Korea**
- (#9845) 2.8 m Power Cord, 250V, 10 A, India**
- (#9847) 2.8 m Power Cord, 250V, 10 A, Brazil**

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: One of #9800, #9820, #9821, #9825, #9827, #9828, #9829, #9830, #9831, #9833, #9834, #9835, #9840, #9841, #9842, #9844, #9845, #9847 or #9848 is required.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#9848) Rack to PDU Line Cord, 110V, 10 A

The following additional Rack to PDU Line Cord can be ordered.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: One of #9800, #9820, #9821, #9825, #9827, #9828, #9829, #9830, #9831, #9833, #9834, #9835, #9840, #9841, #9842, #9844, #9845, #9847 or #9848 is required.
- Corequisites: Feature #9848 is required with the feature #7002.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#9906) New order install

This feature indicates this machine model is part of a new library order.

- Minimum number of features: None
- Maximum number of features: One
- Prerequisites: 3555-E3A must have a 3555-L3A on the same order
- Corequisites: None
- Compatibility conflicts: None
- Limitations: None
- Customer setup: No
- Field/Plant Installable: Plant only
- Comments: e-config to default assign feature #9906 when the order is part of a new Library order

(#ACY1) OEM 1 Order Indicator

This feature indicates an OEM order. It is used by IBM Manufacturing to perform OEM-unique customization. IBM authorization is required prior to ordering this feature.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: For field install (MES upgrade) orders: Not compatible with features ADNR and ACW1.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#ACW1) OEM FC Order Indicator

This feature indicate an OEM order comprised of features only (a field install / MES upgrade order / bulk order). They are used by IBM Manufacturing to perform OEM-unique customization. IBM authorization is required prior to ordering these features.

- Minimum Number of Features: None.
- Maximum Number of Features: 99 (but only one per order).
 - Maximum allowed (one per order) applies to total quantity of all OEM FC Order Indicator features.
 - All optional features, except as noted above, can be ordered at a maximum quantity of 99 per feature and requisite features are not applicable.
 - e-config: Testing of the 99 maximum allowed is not required.
 - EACM: Set Bulk MES flag to YES for this feature to enable use in Blue Harmony MEB orders.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: Not compatible with features ADNR and ACY1.
- Limitations: None.
- Customer setup: Yes.
- Field/Plant Installable: Field only.

(#ADNR) No Rules Order Indicator

This feature indicates the order will not be validated by e-config. It is used for: Field install (MES upgrade) orders. Bulk ordering of enclosures and optional features for inventory stocking purposes. When this feature is specified:

- This FC can be used in conjunction with FCs 1411, 1412, 8002, 8106, 8109, 8116, 9800, 9820, 9821, 9825, 9827, 9828, 9829, 9830, 9831, 9833, 9834, 9835, 9840, 9841, 9842, 9844, 9845, 9847, 9848, AGKF, AGKG, AGKH, AGKJ, AGKK, AGKL, AGKM, AGKN, AGKP.
- All features designated as "Both" plant install and field install can be ordered as a field upgrade at a maximum quantity of 99.
- All features designated as "Field install only" can be ordered as a field upgrade at a maximum quantity of 99.
- Requisite features are not applicable.

If this feature is present on the machine (regardless of whether it was specified with the initial machine order or during a field upgrade to the machine), all subsequent field upgrade orders will not be validated by e-config.

- Minimum Number of Features: None.
- Maximum Number of Features: 99 (but only one per order).
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts:
 - Not compatible with feature ACY1.
 - This FC can be used in conjunction with FCs 1411, 1412, 8002, 8106, 8109, 8116, 9800, 9820, 9821, 9825, 9827, 9828, 9829, 9830, 9831, 9833, 9834, 9835, 9840, 9841, 9842, 9844, 9845, 9847, 9848, AGKF, AGKG, AGKH, AGKJ, AGKK, AGKL
- Limitations:
 - Only the following features are allowed on the initial machine order:
 - TAA compliance (feature 0983).
 - Shipping and handling charge (features AGxx).
 - ServicePac indicators (features B0xx and B1xx).
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AG00) Shipping and Handling - No charge

This feature indicates Machine type 3555 will have no shipping and handling charge added to the order.

Note: Select either feature #AGGJ or feature #AGGK or feature #AG00 on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#AGGJ) Shipping and Handling -- Charge

This feature indicates each Machine type 3555 model L3A on the order will have a shipping and handling charge added to the order.

Note: Select either feature #AGGJ or feature #AGGK or feature #AG00 on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#AGGK) Shipping and Handling -- Charge

This feature indicates each Machine type 3555 model E3A on the order will have a shipping and handling charge added to the order.

Note: Select either feature #AGGJ or feature #AGGK or feature #AG00 on the order.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

(#AGGY) IBM Tape TS4300 Select - 3U Automation LTO 6

This feature delivers a predefined bundled configuration that provides one TS4300 tape library with one LTO 6 HH SAS Tape Drive.

Must only contain the below features in specified quantity. No other modifications can be made to this order.

- 1 of TS4300 Tape Library (3555-L3A)
- 1 of LTO 6 HH SAS Tape Drive (#AGKG)
- 1 of SAS Tape Drive Support (#1412)
- 1 of 2.0M Mini-SAS/Mini-SAS 1X Cable (#5502)
- 1 of LTO Cleaning Cartridge (#8002)
- 1 of Ultrium 6 Data Cartridge (5-pack) (#8605)
- 1 of Attached to Linux System (#9215)
- 1 of 2.8m Power Cord, 125V 15A, US/Canada (#9800)
- Feature type: No Charge
- Minimum number of features: Zero
- Maximum number of features: One.
- Limitations: Supported on Model L3A only.
- Installation: Plant only

(#AGGZ) IBM Tape TS4300 Select - 3U Automation LTO 7

This feature delivers a predefined bundled configuration that provides one TS4300 tape library with one LTO 7 HH Fibre Tape Drive.

Must only contain the below features in specified quantity. No other modifications can be made to this order.

- 1 of TS4300 Tape Library (3555-L3A)
- 1 of LTO 7 HH Fibre Tape Drive (#AGKJ)
- 1 of Fibre Tape Drive Support (#1411)
- 1 of 10 meter OM3 Fiber Cable (LC) (#AGK1)
- 1 of LTO Cleaning Cartridge (#8002)
- 1 of Ultrium 7 Data Cartridge (5-pack) (#8706)
- 1 of Attached to Linux System (#9215)
- 1 of 2.8m Power Cord, 125V 15A, US/Canada (#9800)
- Feature type: No Charge
- Minimum number of features: Zero
- Maximum number of features: One.
- Limitations: Supported on Model L3A only.
- Installation: Plant only

(#AGK1) 10 meter OM3 fiber Cable (LC)

This feature provides a 10 meter 50.0/125 micrometer fiber optic cable terminated with LC Duplex connectors.

Note: For Full height drives, up to two cables can be used.

- Minimum Number of Features: None.
- Maximum Number of Features: 99.
- Prerequisites: Mutually exclusive with feature #9700.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGK2) 25 meter OM3 fiber Cable (LC)

This feature provides a 25 meter 50.0/125 micrometer fiber optic cable terminated with LC Duplex connectors.

Note: For Full height drives, up to two cables can be used.

- Minimum Number of Features: None.
- Maximum Number of Features: 99.
- Prerequisites: Mutually exclusive with feature #9700.

- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGKF) LTO 6 HH Fibre channel drive

This feature is a drive containing one IBM LTO Ultrium 6 Half-High Fibre Channel Tape Drive with a native 8 Gbps interface, which may be installed into a TS4300 Tape Library. Cables, ordered separately, are required to attach the TS4300 Tape Library to a host Fibre Channel adapter.

- Minimum Number of Features: One in a Model L3A, zero in a Model E3A.
- Maximum Number of Features:
 - One FH Drive (#AGKH, #AGKL), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK) in any combination in a Model L3A and E3A
- Prerequisites: At least one Fibre Channel cable, or the No Host/SAN Cable from Plant feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGKG) LTO 6 HH SAS Drive

This feature is a drive containing one IBM LTO Ultrium 6 Half-High SAS Tape Drive with a native 6 Gbps interface, which may be installed into a TS4300 Tape Library. Cables, ordered separately, are required to attach the TS4300 Tape Library to a host SAS adapter.

- Minimum Number of Features: One in a Model L3A, zero in a Model E3A.
- Maximum Number of Features:
 - One FH Drive (#AGKH, #AGKL), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK) in any combination in a Model L3A and E3A
- Prerequisites: At least one Fibre Channel cable, or the No Host/SAN Cable from Plant feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGKH) LTO 6 FH Fibre channel drive

This feature provides one IBM LTO Ultrium 6 Tape Drive with a dual-port Fibre Channel interface into a new TS4300 Tape Library, or provides one additional Ultrium 6 Fibre Channel Tape Drive into a currently installed TS4300 Tape Library. The tape drive has a LC connector.

- Minimum Number of Features: One in a Model L3A, zero in a Model E3A.
- Maximum Number of Features:
 - One FH Drive (#AGKH, #AGKL, #AGKP), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN) in any combination in a Model L3A and E3A
- Prerequisites: At least one Fibre Channel cable, or the No Host/SAN Cable from Plant feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGKJ) LTO 7 HH Fibre channel drive

This feature is a drive containing one IBM LTO Ultrium 7 Half-High Fibre Channel Tape Drive with a single port 8 Gbps interface, which may be installed into a TS4300 Tape Library. Cables, ordered separately, are required to attach the TS4300 Tape Library to a host Fibre Channel adapter.

- Minimum Number of Features: One in a Model L3A, zero in a Model E3A.
- Maximum Number of Features:
 - One FH Drive (#AGKH, #AGKL), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK) in any combination in a Model L3A and E3A
- Prerequisites: At least one Fibre Channel cable, or the No Host/SAN Cable from Plant feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Corequisites: None.

- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGKK) LTO 7 HH SAS Drive

This feature is a drive containing one IBM LTO Ultrium 7 Half-High SAS Tape Drive with a dual port 6 Gbps interface, which may be installed into a TS4300 Tape Library. Cables, ordered separately, are required to attach the TS4300 Tape Library to a host SAS adapter.

- Minimum Number of Features: One in a Model L3A, zero in a Model E3A.
- Maximum Number of Features:
 - One FH Drive (#AGKH, #AGKL), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK) in any combination in a Model L3A and E3A.
- Prerequisites: At least one Fibre Channel cable, or the No Host/SAN Cable from Plant feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGKL) LTO 7 FH Fibre channel drive

This feature provides one IBM LTO Ultrium 7 Tape Drive with a dual-port Fibre Channel interface into a new TS4300 Tape Library, or provides one additional Ultrium 7 Fibre Channel Tape Drive into a currently installed TS4300 Tape Library. The tape drive has a LC connector.

- Minimum Number of Features: One in a Model L3A, zero in a Model E3A.
- Maximum Number of Features:
 - One FH Drive (#AGKH, #AGKL, #AGKP), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN) in any combination in a Model L3A and E3A
- Prerequisites: At least one Fibre Channel cable, or the No Host/SAN Cable from Plant feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable.
- Customer setup: Yes.
- Field/Plant Installable: Plant or Field.

(#AGKM) LTO 8 HH Fibre channel drive

This feature is a drive containing one IBM LTO Ultrium 8 Half-High Fibre Channel Tape Drive with a single port 8 Gbps interface, which may be installed into a TS4300 Tape Library. Cables, ordered separately, are required to attach the TS4300 Tape Library to a host Fibre Channel adapter.

Note: One feature #1411 is required per Tape Library if this is the first LTO6 HH (#AGKF) or LTO6 FH (#AGKH) or LTO7 HH (#AGKJ) or LTO7 FH (#AGKL) or LTO8 HH (#AGKM) or LTO8 FH (#AGKP) Tape drive ordered.

- Minimum number of features: One drive of any type in a Model L3A; zero in a Model E3A.
- Maximum number of features:
 - One FH Drive (#AGKH, #AGKL, #AGKP), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN) in any combination in a Model L3A and E3A
- Removable: Yes.
- Prerequisites: At least one Fibre Channel cable, or the No SAN Cable feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable
- Installation: Plant or Field.

(#AGKN) LTO 8 HH SAS drive

This feature is a drive containing one IBM LTO Ultrium 8 Half-High SAS Tape Drive with a dual port 6 Gbps interface, which may be installed into a TS4300 Tape Library. Cables, ordered separately, are required to attach the TS4300 Tape Library to a host SAS adapter.

Note: One feature #1412 is required per Tape Library if this is the first LTO 6 HH (#AGKG) or LTO7 HH (#AGKK) or (LTO8 HH #AGKN) Tape drive ordered.

- Minimum number of features: One drive of any type in a Model L3A; zero in a Model E3A.
- Maximum number of features:

- One FH Drive (#AGKH, #AGKL, #AGKP), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN), or
- Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN) in any combination in a Model L3A and E3A
- Removable: Yes.
- Prerequisites: At least one Fibre Channel cable, or the No SAN Cable feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable
- Installation: Plant or Field.

(#AGKP) LTO 8 FH Fibre channel drive

This feature provides one IBM LTO Ultrium 8 Tape Drive with a dual-port Fibre Channel interface into a new TS4300 Tape Library, or provides one additional Ultrium 8 Fibre Channel Tape Drive into a currently installed TS4300 Tape Library. The tape drive has a LC connector.

Note: One feature #1411 is required per Tape Library if this is the first LTO6 HH (#AGKF) or LTO6 FH (#AGKH) or LTO7 HH (#AGKJ) or LTO7 FH (#AGKL) or LTO8 HH (#AGKM) or (LTO8 FH #AGKP) Tape drive ordered.

- Minimum number of features: One in a Model L3A; zero in a Model E3A.
- Maximum number of features:
 - One FH Drive (#AGKH, #AGKL, #AGKP), and One HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN), or
 - Three HH Drives (#AGKF, #AGKG, #AGKJ, #AGKK, #AGKM, #AGKN) in any combination in a Model L3A and E3A
- Removable: Yes.
- Prerequisites: At least one Fibre Channel cable, or the No SAN Cable feature #9700 must be specified on the initial plant order. FC1899 is required on the E3A Model.
- Limitations: When feature ACW1 or ADNR is present on order, the maximum quantity allowed is 99 and pre-requisite features are not applicable
- Installation: Plant or Field.

(#AHZC) VersaStack Solution Indicator

This feature indicates the machine is a component within a VersaStack Solution.

- Minimum Number of Features: None.
- Maximum Number of Features: One.
- Prerequisites: None.
- Corequisites: None.
- Compatibility conflicts: None.
- Limitations: None.
- Customer setup: No.
- Field/Plant Installable: Plant only.

Feature exchanges

None.

[↑ Back to top](#)

Accessories

None.

Customer replacement parts

None.

[↑ Back to top](#)

Supplies

For end users:

The IBM LTO Ultrium Data Cartridges and the IBM LTO Cleaning Cartridge can be purchased from IBM using the following feature codes with the initial library order:

- 8002 LTO Cleaning Cartridge
- 8605 Ultrium 6 Data Cartridge (5-Pack)
- 8706 Ultrium 7 Data Cartridge (5-pack)
- 8806 Ultrium 8 Data Cartridge (5-pack)

IBM LTO Ultrium data and cleaning cartridges can also be ordered directly through AAS using machine type 3589, or online through <https://www.ibm.com/storage/media> website and specify the LTO media product. Refer to the 3589 Sales Manual for further information.

For information about IBM branded media, such as additional IBM LTO Ultrium data or cleaning cartridges, call 888-IBM-MEDIA (426-6334) in the U.S. or Canada, or refer to the <https://www.ibm.com/storage/media> website.

Supplemental media

None.

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