LINEAR TAPE OPEN

LTO

ULTRIUM TAPE DRIVES

STORAGETEK ®

Key benefits

Cost-effective capacity

With the ability to store up to 400 gigabytes of native data on a single cartridge, you can reduce your media costs and tape counts while accommodating data growth.

Reduced backup windows

The capacity and throughput performance of LTO Ultrium technology enable you to accelerate backups by processing more information within limited windows. The LTO Ultrium Generation 3 tape drive moves data at rates as high as 80 megabytes per second.

Exceptional performance

Capabilities such as dynamic rate matching and dual mode compression enhance tape drive performance and product life.

SAN-readiness

LTO drives provide a Fibre Channel interface that connects directly to new or existing SANs.

Enhanced data protection

Powerful correction and verification capabilities protect data integrity and help prevent data loss. The LTO Ultrium Generation 3 tape drives are rated for more than 100,000 loads and unloads and one million tape passes before failure*.

Efficient WORM-capable media integration

Secure, manage and archive data records to adhere to stringent regulatory demands using WORM-capable media. The LTO Ultrium Generation 3 drives offer support for LTO Ultrium Write-Once Read-Many (WORM) media.

Linear Tape Open Ultrium tape drives

Today's continuous business environment requires that you back up more data in less time. Linear Tape Open (LTO) Ultrium tape drives offer an economical, high-performance option for mid-range tape automation environments. LTO drives feature fast data transfer rates and huge capacity so you can handle more data in less time. The high-speed Fibre Channel interface further speeds data movement to shorten backup windows, reduce downtime and speed recovery. Combined with L-Series™ tape libraries and Library Admin software, you can easily and affordably store, manage and protect your growing data.

StorageTek® offers LTO Ultrium tape drives from Hewlett-Packard, IBM, and Certance. You choose the drive and manufacturer that makes the most sense for your operating environment and application. And no matter which drive you choose, it will fit seamlessly into StorageTek's scalable tape automation solutions.

Protect your investment with a solid upgrade path

LTO drives feature a four-generation upgrade path so you can make the most of your technology investment. Their open format supports a wide variety of media, automation systems. And the LTO Compliance Verification Entity, an independent company, verifies interchange across LTO vendors and product generations.

ULTRIUM **LTO**

LTO Ultrium tape drives specifications*

Perfomance	LTO Gen 2	LTO Gen 3
Access time[C]	See footnote	See footnote
Tape load and thread to ready	15–24 sec	19 sec
Average file access time (first file)	64–75 sec	72 sec
Maximum/average rewind time	98/49–104/52 sec	98/49 sec
Unload time	13–19 sec	19 sec
Data transfer rate, native (uncompressed)	32–35 MB/sec[A, B, F]	80 MB/sec[A]
Data transfer rate, (compressed, 2:1)	60–70 MB/sec[A, B, F]	160 MB/sec[A]

Capacity		
Capacity, native (uncompressed)	200 GB	400 GB

Availability		
Mean time between failures (MTBF)		
Power on	250,000 hr @ 100% duty cycle	250,000 hr @ 100% duty cycle
Head life	60,000 hr	60,000 hr
Uncorrected bit error rate	1×10^{-17}	1×10^{-17}
Undetected bit error rate	1×10^{-27}	1×10^{-27}

Compatibility		
Interface (SCSI)	Single port Ultra 3 SCSI	Ultra 320 SCSI
Burst transfer rate	LVD 160 MB/sec	320 MB/sec[G]
Channel rate (Fibre Channel)	200 MB/sec (maximum instantaneous)[D, E]	200 MB/sec (maximum instantaneous)[G]
Interface (Fibre Channel)	Single[D], Dual[E], N_ and NL_Port, FC-PLDA (Hard and soft AL_PA capability), FC-AL-2, FCP-2, FC-Tape[D, E]	FC-PI, FC-FS, FC-FLA, FC-GS-3, FC-AL-2, FCP-2, FC-Tape, FC-FLA[G]
Read/write compatibility interface	Ultrium 2, Ultrium proprietary format (read only)	Ultrium 3, Ultrium 2, Ultrium 1 (read only) proprietary format
Emulation modes	LTO Ultrium 2, Ultrium proprietary format (read only)	LTO Ultrium 3

Mechanical		
Height	3.25 (8.25 cm)	3.25 in (8.25 cm)
Depth	8.0 in (20.3 cm)	8.0 in (20.3 cm)

Environmental		
Temperature		
Operating	+50° to +100° – +104° F (+10° to +38°– +40° C)	+50° to +104° F (+10° to +40° C)
Non-operating	-40° to +139° – +150° F (-40° to +66° C)	-40° to +150° F (-40° to +66° C)
Relative humidity		
Operating	20%–80%	20%–80%
Non-operating	10%–95%	10%–95%

Power		
Voltage (L20, L40, L80)	+ 5 VDC, + 12 VDC	varies depending on library specifications
Voltage (L180, L700e)	100–200 VAC @ 50–60 Hz	
Voltage (L5500)	220–240 VAC @ 50–60 Hz	

A. Continuously variable to 10 megabytes per second to match slower channels using HP Adaptive Tape Speed system (ATS).
B. Auto-adjustable to 17.5 megabytes per second to match slower channels.
C. The actions of the tape drive can be divided into four distinct phases:
Phase 1: Load time — the amount of time required to insert a cartridge in the drive, load the tape and prepare to read, write or search.
Phase 2: Average file access time — the amount of time required to search from beginning of tape to the mid point; does not include load time.
Phase 3: Maximum rewind time — the amount of time required to rewind the tape from the end to the beginning of the tape. The average rewind time is the time to rewind a tape from the midpoint to the beginning, (i.e., one-half of the maximum rewind time.)
Phase 4: Unload time — the amount of time to eject the cartridge from the drive.

D. Specifications are for the IBM StorageSmart T400F drive.
E. Specifications are for the Hewlett-Packard 460 Fibre Channel tape drive.
F. Auto adjustable to 12 megabytes per second to match slower channels using Certance 13-Speed Transfer feature.
G. Specifications are for the Hewlett-Packard LTO Ultrium 3 Fibre Channel Drive.

* StorageTek offers LTO drives from all three LTO consortium members: Hewlett-Packard, Certance and IBM. See vendors' websites for individual specifications.

ABOUT STORAGETEK®

Storage Technology Corporation (NYSE: STK) is a $2 billion global company that enables businesses, through its information lifecycle management strategy, to align the cost of storage with the value of information. The company's innovative storage solutions manage the complexity and growth of information, lower costs, improve efficiency and protect investments. For more information, visit www.storagetek.com, or call 1.800.275.4785 or 01.303.673.2800.

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