

## STORAGETEK T10000C TAPE DRIVE

### THE ULTIMATE ARCHIVE

#### KEY BENEFITS

- **Lowest total cost of ownership.** Fewer drives, libraries and media do the same job with T10000C's highest capacity and fastest throughput
- **Unprecedented performance.** StorageTek Accelerator features maximize data center efficiency
- **Best in class data availability.** Enterprise design and data integrity validation ensure reliable access to data
- **Simplified management.** A host of new data management tools, and compatibility with Oracle enterprise tape products make it simple to manage extreme amounts of data
- **Protect your data and your business.** Choose encryption and WORM technology—to meet evolving requirements for data security and compliance

*Oracle's StorageTek T10000C enterprise tape drive blends the highest capacity, performance, reliability, and data security to support demanding, 24/7 data center operations. The eco-efficient StorageTek T10000C tape drive also ensures the lowest total cost of ownership, and proven reliability with ongoing compatibility with StorageTek enterprise libraries as well as third-party hardware and software.*



Figure 1. The StorageTek T10000C tape drive delivers breakthrough economics.

### Support the Most Demanding Data Center Operations

The StorageTek T10000C tape drive delivers superior value and performance for any data storage and retrieval:

- **Lowest total cost of ownership.** Fewer drives, libraries and media do the same job with T10000C's highest capacity and fastest throughput
- **Unprecedented performance.** StorageTek Accelerator features maximize data center efficiency
- **Best in class data availability.** Enterprise design and data integrity validation ensure reliable access to data
- **Simplified management.** A host of new data management tools, and compatibility with Oracle enterprise tape products make it simple to manage extreme amounts of data
- **Protect your data and your business.** Choose encryption and WORM technology—to meet evolving requirements for data security and compliance

### Lower Your TCO with the StorageTek T10000C

The StorageTek T10000C tape drive delivers a potent combination: native capacity of 5 terabytes (5.5 terabytes with StorageTek Maximum Capacity feature enabled) and full file

performance of 240 megabytes per second. This means fewer tape drives and cartridges do the same amount of work. Library footprint is reduced and media management is simplified, because you manage fewer drives and tapes. Writing 5 terabytes of data without a media exchange, improves operational efficiency. Sport cartridges enable even faster access to data; add them to the mix to achieve a hybrid access/capacity solution. As an industry first, the StorageTek T10000C and a fully loaded StorageTek SL8500 modular library system combine to provide the first ever exabyte<sup>1</sup> of data storage managed as one massive tape archive!

Archive management features including StorageTek Maximum Capacity and StorageTek Tape Tiering Accelerator mean less frequent media purchases, while StorageTek T10000A and StorageTek T10000B backward read compatibility preserves existing media investment. Because the StorageTek T10000C tape drive offers both mainframe (FICON) and open systems (Fibre Channel) connectivity, you can transition between the two environments easily.

Tape-based storage also minimizes power, cooling, and acquisition cost. Compared to low-end disk storage, tape is 200 times more energy efficient and 15 times less expensive<sup>2</sup>. As a key component of eco-efficient data centers, tape excels in applications as diverse as production, data management, backup/restore, disaster recovery, and archive.

Pair the StorageTek T10000C tape drive with the StorageTek SL8500 or StorageTek SL3000 modular library system to accelerate data consolidation efforts. As data center storage needs increase, manage costs effectively by combining the highest tape capacity on the market with the eco-efficiencies of tape.

### Unprecedented Performance with StorageTek Accelerator Features

Backup windows will shrink with 240 megabytes per second full file throughput, twice as fast as the previous generation tape drive, while StorageTek tape accelerator features maximize tape performance.

Starts and stops are unavoidable in an enterprise data center, but can be minimized with the StorageTek T10000C. Starts, stops and back-hitching are nearly eliminated with a 2 gigabyte buffer to maximize streaming, StorageTek File Sync Accelerator to write small blocks more efficiently and StorageTek Tape Application Accelerator to buffer tape marks.

Finally, the StorageTek Search Accelerator improves HSM audit times 400% over other similar search technologies. Increased speed means shorter backup windows and fewer drives to do the work.

### Best in Class Data Availability with Exceptional Tape Drive Design

When writing large volumes of data to tape, be sure that the file transferred correctly, the first time. StorageTek Data Integrity Validation reads CRC checksum files (based on the T10 ANSI standard) to verify that data was not corrupted en-route to the tape drive.

The StorageTek T10000C tape drive is engineered to support demanding 24/7 high-duty cycle operations. The StorageTek SafeGuide tape path, which is the tape guiding system of the StorageTek T10000C tape drive, provides long-term data and drive reliability:

- The buckler mechanism securely attaches the cartridge leader to the drive leader
- The long tape path guides the media more accurately and reduces tape tension, which also reduces stress on the drive and media
- The tape guides contact only the backside of the media, not the recording surface,

<sup>1</sup> Assuming 2:1 compression

<sup>2</sup> The Clipper Group, "In Search of the Long-Term Archiving Solution – Tape Delivers Significant TCO Advantages over Disk", Dec. 23, 2010

minimizing lateral tape motion and protecting data integrity

- The unique hub-locking mechanism protects your data during cartridge transport

The dual-head design of the StorageTek T10000C tape drive spreads data across the tape width and provides the highest level of error correction code capability. It also ensures high throughput, even at lower tape speeds, which reduces stress on the drive and media. In addition, the dual heads provide 32 tracks that write data simultaneously on each pass. Mid-range tape drives write with 16 tracks, which means they require more tape passes to fill the media, which increases media wear.

### Extreme Capacity Simplified, with StorageTek Management Features

New data management tools facilitate the management of 5 terabytes of data on a single cartridge. With StorageTek Tape Tiering Accelerator and StorageTek In-Drive Reclaim Accelerator, tape is partitioned into more manageable segments. This facilitates faster data recall and the most efficient use of tape space.

### Protect Your Data, Protect Your Business

Choose one or both—encryption and WORM technology—to meet evolving requirements for data security and compliance.

The StorageTek T10000C tape drive has built-in encryption that works in conjunction with Oracle Key Manager, an appliance that provides a simple, centralized, scalable solution for managing the keys used to encrypt and decrypt data written by the StorageTek T10000C tape drive. The encryption capability is the same proven technology that is used in the previous generation StorageTek T10000A and StorageTek T10000B tape drives, StorageTek LTO-5 tape drives, and the StorageTek T9840D tape drive. Use encryption to ensure that only the right people have access to the data, and avoid potential legal and financial problems caused by loss or theft of unencrypted data.

StorageTek VolSafe secure media technology for the StorageTek T10000C tape drive helps you meet stringent electronic storage regulatory and legal requirements with WORM capability. Store data securely on non-erasable, non-rewritable tape and recall data quickly when you need it.

### Simplify Media Services

When you want to organize and optimize media to reduce downtime, risk, and maintenance, turn to Oracle for expert assistance. Media conversion services help you move data in optical, tape, and disk formats to new or different technology that offers higher capacity, lower cost, and lower risk. For example, it may be time to convert WORM optical to WORM VolSafe tape. And when optimizing data center facilities, tape relocation services expedite data center relocation and rack relocation activities.

### Engage the Storage Experts

Oracle offers tailored, mission critical services and support for your storage environment. Oracle Advanced Customer Services helps you address storage challenges by delivering installation, configuration, optimization and on-going monitoring, and tailored support. Oracle service professionals help you achieve the highest levels of system performance and availability with diagnostic and monitoring tools that help anticipate, identify and remediate any potential issues. From tape library installation services, to the design and implementation of key management encryption systems, Oracle service experts help you realize more value from your storage infrastructure - with less disruption to your business. For more information contact your Oracle representative, email [acsdirect\\_us@oracle.com](mailto:acsdirect_us@oracle.com) or visit [oracle.com/acs](http://oracle.com/acs).

<b>StorageTek T10000C Tape Drive Specifications</b>	
<b>Capacity</b>	
Native capacity (uncompressed)	5TB (1TB sport cartridge) Up to 5.5TB with StorageTek Maximum Capacity
<b>Performance</b>	
Native sustained data rate (uncompressed)	252 MB/sec
Full file host data rate (uncompressed)	240 MB/sec (includes wrap turnarounds)
Native sustained data rate (compressed)	360 MB/sec
Access time* (see note)	Tape load and thread: 13.1 sec Average file access (excludes load/thread): 57 sec (17.5 sec for Sport Cartridge) Maximum rewind: 115 sec (32.5 sec for Sport Cartridge) Unload time: 26 sec
Buffer	2 GB
<b>Availability</b>	
Archive life	30+ years
Uncorrectable Bit Error Rate (UBER)	$1 \times 10^{-19}$
Drive loads/unloads	>150,000
<b>Compatibility</b>	
Interface	4 Gb native Fibre Channel, native FICON
Interface specifications (Fibre Channel)	N and NL port, FC-AL-2, FCP-2, FC-tape, 4 Gb FC
Read compatibility interface	T10000A and T10000B on StorageTek T10000 media T10000C on StorageTek T10000 T2 media
Emulation modes	3592 (MVS), VSM
Automation	StorageTek SL8500, StorageTek SL3000, rackmount
<b>Mechanical</b>	
Height	3.2 in. (8.1 cm)
Depth	16.75 in. (42.6 cm)
Width	5.77 in. (14.6 cm)
<b>Environmental</b>	
Temperature	Operating: +60°F to +90°F (+15°C to +32°C) Non-operating (storage): +50°F to +104°F (+10°C to +40°C)
Relative humidity	Operating: 20% to 80% Non-operating: 10% to 95%

Tape Format	
Linear Serpentine	
Power	
Consumption/dissipation (drive only)	
operating max continuous – not peak	67 W
hibernate mode	31 W
Encryption	
<p>The StorageTek T10000C tape drive works in conjunction with the Oracle Key Manager (OKM). The OKM delivers a simple, secure, centralized solution for managing the keys used to encrypt and decrypt data written by the StorageTek T10000C tape drive. Developed as an hardened solution, the OKM consists of our key management software, Sun server, OKM GUI/CLI that are executed on a workstation, and SCA 6000 cryptographic card (optional). The OKM runs without regard to application, operating platform, or primary storage device. It complies with Federal Information Processing Standard (FIPS) 140-2 certification. Requirements and specifications may change, so check with your Oracle representative.</p>	

\*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 the beginning of the tape to the midpoint; 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, that is, one-half of the maximum rewind time.

Phase 4. Unload time—the amount of time required to eject the cartridge from the drive.

## Contact Us

For more information about Oracle's StorageTek T10000C tape drive, visit [oracle.com](http://oracle.com) or call +1.800.ORACLE1 to speak to an Oracle representative.



Oracle is committed to developing practices and products that help protect the environment

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