Ultrastar® 7K4000

3.5-Inch Enterprise 7200 RPM Hard Disk Drives

Highlights

- 2.0 million hours MTBF[1]
- Up to 4 terabytes[2] of capacity
- SATA 6Gb/s and SAS 6Gb/s models for configuration flexibility
- Advanced Format* SATA with 512-byte emulation (512e)*
- Dual Stage Actuator (DSA) and Enhanced Rotational Vibration Safeguard (RVS) for robust performance in multi-drive environments
- 24x7 accessibility for enterprise-class, capacity-optimized applications
- 5-year limited warranty

Applications/Environments

- Cloud storage
- Massive Scale Out (MSO)
- Data warehousing & mining
- Disk-to-disk backup & archiving
- RAID arrays
- Network Attached Storage (NAS)

Delivering Industry-Leading Quality and Reliability

HGST Ultrastar® 7K4000 is the world's first 4TB 7200 RPM hard drive with a 2.0 million hours MTBF specification and backed by a full 5-year warranty. Ultrastar 7K4000 represents the sixth-generation HGST 5-platter design, which has been field proven by top server and storage OEMs and Internet giants. Engineered for the highest quality, the Ultrastar 7K4000 is put through grueling design tests during development and must pass stringent ongoing reliability testing during manufacturing. Ultrastar 7K4000 delivers by reducing downtime, eliminating service calls and minimizing TCO.

Increasing Capacity Density by One Third

To deal with the explosive petabyte (PB) growth, data centers require large amounts of efficient storage. Reducing W/GB without expanding floor space is vital to lowering operating costs. To meet these demands, Ultrastar 7K4000 delivers 33% more capacity in the same footprint at 24% lower W/GB than its predecessor, Ultrastar 7K3000. Now you can get 2.4PB in the footprint of a standard 19-inch enterprise storage rack by stacking ten 4U, 60-bay enclosures. Ultrastar 7K4000 dual port SAS is available in traditional 512, 520 and 528 byte sector size. Ultrastar 7K4000 SATA is an Advanced Format* drive, using 4096-byte sector size to provide enormous capacity earlier than otherwise possible for environments optimized for this technology. Advanced Format drives are backwards compatible with legacy 512-byte sector size by offering built-in 512-byte emulation through the SATA interface.

Combining 7200 RPM Performance and Granular Power Control

Operating at 7200 RPM, Ultrastar 7K4000 offers better overall performance than slower RPM capacity-oriented drives, and does so at impressively low power-consumption rates. The Ultrastar 7K4000 can help data centers achieve lower AC power and HVAC requirements. With five Advanced Power Management modes, the 7K4000 achieves a 59% reduction in watts during low RPM idle mode, and uses less than 2W during standby/sleep modes, freeing up precious headroom for growing enterprise needs.

Innovating for a More Sustainable Environment

The Ultrastar 7K4000, with its halogen-free design and power-efficient operation, qualifies for the HGST EcoTrac classification, which identifies products that minimize environmental impact in the areas of product design, manufacturing, operation and disposal.

* A legacy 512-byte configuration is also available.

Features and Benefits

	Feature / Function	Benefits
Capacity	4TB, 3TB and 2TB	Highest enterprise capacity available in a single platform
Performance	7200 RPM	High performance for business critical applications
	Rotational Vibration Safeguard (RVS)	Maintains drive performance in high rotational vibration environments and multi-drive systems
Reliability	Thermal Fly-height Control (TFC) with internal thermal sensor	Better soft error rate for improved reliability and performance
	Head load/unload	Protects disk during non-operation
	SMART command transport	Adaptive error correction
Power	Improved Watts per gigabyte (W/GB)	24% lower W/GB than predecessor for maximum efficiency
Security	Optional Bulk Data Encryption (SATA) and TCG Enterprise__A (SAS)	Encrypt private data, providing security and easy redeployment

4TB, 3TB and 2TB l 7200 RPM
SATA 6Gb/s and SAS 6Gb/s

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HGST Quality and Service

HGST's Ultrastar 7K4000 extends the company's long-standing tradition of performance and capacity leadership. The proven drive design enables high reliability and availability to customer data. Ultrastar quality, performance and world class technical support and service provides customers with a lower total cost of ownership over previous generations.

HGST drives are backed by an array of technical support and services, which may include customer and integration assistance. HGST is dedicated to providing a complete portfolio of HDD/SSD solutions to satisfy today's monumental computing needs.

How to read the Ultrastar model number

HUS724040ALE640 = 4TB, SATA 6Gb/s, 64MB buffer

H	=	HGST
U	=	Ultrastar
S	=	Standard
72	=	7200 RPM
40	=	Full capacity — 4TB
40	=	Capacity this model, 40 = 4TB (30 = 3TB, 20 = 2TB)
A	=	Generation code
L	=	26.1mm z-height
E6	=	Interface, SATA 6Gb/s, 512e (A6 = SATA 512n, S6 = SAS 512n)
4	=	64MB buffer
0	=	No encryption (1 = encryption)

Information and Technical Support
www.hgst.com (Main Web site)
www.hgst.com/partners (Partner Web site)

North America
support__usa@hgst.com
Toll free: 1 888 426-5214, Direct: 1 408 717-8087

Asia Pacific
support__ap@hgst.com / 65 6840 9595

EMEA and UK
support__uk@hgst.com / 44 20 7133 0032

Germany
support__uk@hgst.com / 49 6929 993601

Program Support
Partners First Program. channelpartners@hgst.com

[1] MTBF target is based on a sample population and is estimated by statistical measurements and acceleration algorithms under median operating conditions. MTBF ratings are not intended to predict an individual drive's reliability. MTBF does not constitute a warranty.
[2] One MB is equal to one million bytes, one GB is equal to one billion bytes and one TB equals 1,000GB (one trillion bytes) when referring to hard drive capacity. Accessible capacity will vary from the stated capacity due to formatting and partitioning of the hard drive, the computer's operating system, and other factors.
[3] Advanced Format drive: 4K (4096-byte) physical sectors with 512-byte emulation (512e). 512n = 512-byte native physical sectors
[4] Portion of buffer capacity used for firmware
[5] MB/s based on 1,000,000 bytes per second
[6] Excludes command overhead

Specifications

Model # / Part #			
	4TB	HUS724040ALE640 / 0F14683	HUS724040ALS640 / 0B26885
		HUS724040ALE641 / 0F17719	HUS724040ALS641 / 0B26927
	3TB	HUS724030ALE640 / 0F14684	HUS724030ALS640 / 0B26886
		HUS724030ALE641 / 0F17731	HUS724030ALS641 / 0B26926
	2TB	HUS724020ALE640 / 0F14685	HUS724020ALS640 / 0B26887
		HUS724020ALE641 / 0F19843	HUS724020ALS641 / 0B26925
	4TB	HUS724040ALA640 / 0F14688	
	3TB	HUS724030ALA640 / 0F14689	
	2TB	HUS724020ALA640 / 0F14690	

Configuration		
Interface	SATA 6Gb/s	SAS 6Gb/s
Capacity (GB)[2] at 512 bytes/sector	4TB / 3TB / 2TB	←
Form factor	3.5-inch	←
Sector size (bytes)[3]	512e , 512n	512 / 520 / 528
Max. areal density (Gbits/sq. in)	446 (512e) , 475 (512n)	475
Performance		
Data buffer (MB)[4]	64	←
Rotational speed (RPM)	7200	←
Interface transfer rate (MB/s, max)	600	←
Sustained transfer rate (MB/s, typical)[5]	181 (512e) , 172 (512n)	172
Seek time (read, ms, typical)[6]	8.0	←
Reliability		
Error rate (non-recoverable, bits read)	1 in 10^{15}	←
Load/Unload cycles (at 40° C)	600,000	←
Availability (hrs/day x days/wk)	24x7	←
MTBF[1] (M hours)	2.0	←
Warranty (yrs)	5	←
Acoustics		
Idle (Bels, typical)	2.9	←
Power		
Requirement	+5 VDC (+/-5%) +12VDC (+10%/-8%)	←
Startup current (A, max)	1.2 (+5V), 2.0 (+12V)	←
Read/write (W)	11.4	10.9
Idle (W, avg)	6.9	7.6
Unload idle (W)	5.7	6.2
Physical size		
z-height (mm, max)	26.1	←
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	←
Weight (g, typical)	690	←
Environmental (operating)		
Ambient temperature	5° to 60° C	←
Shock (half-sine wave 2 ms, G)	70	←
Vibration (G RMS, 5 to 500 Hz)	0.67 (XYZ)	←
Environmental (non-operating)		
Ambient temperature	-40° to 70° C	←
Shock (half-sine wave, 1ms, G)	300	←
Vibration (G RMS, 5 to 500 Hz)	1.04 (XYZ)	←

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