

Ultrastar® Archive Ha¹⁰

3.5-Inch Active Archive Enterprise Hard Disk Drives

Highlights

- Industry's first enterprise-grade 10TB¹ capacity hard drive
- Combines HelioSeal and host-managed SMR to deliver 25% capacity improvement
- Purpose-built for new market category of Active Archive applications
- Consistent, predictable performance for true enterprise experience
- Uncompromising enterprise-class reliability and quality
- 2M hour MTBF² rating and 5-year warranty

Applications/Environments

- Active Archive
- Big Data or Bulk Storage
- Cloud Storage
- Social Media
- Content Libraries, Streaming Media and Digital Media Assets
- Online Back-up, Replication
- Compliance, Audits, Regulatory Records



10TB host-managed SMR for Active Archive workload

Beyond Create and Modify: Purpose-built for Active Archive

As the world's first enterprise-class 10TB HDD, HGST launches Ultrastar Archive Ha¹⁰ to address the emerging Active Archive segment in the capacity enterprise space. Optimized for highest capacity at the lowest TCO, the Ha¹⁰ provides unprecedented capacity leadership by harnessing two core complementary technologies—HelioSeal® and host-managed shingled magnetic recording (SMR)—to deliver uncompromising quality and reliable performance.

Designed with the Customer in Mind

At the core of its design, the Ha¹⁰ leverages the proven and mature HelioSeal platform to deliver an unmatched Watt/TB power footprint, ideal for ultra-dense scale-out storage systems, with uncompromising product reliability, necessary for private and public cloud enterprise applications.

By combining host-managed SMR with HelioSeal, Ha¹⁰ offers a 25% increase in capacity compared to drives using perpendicular magnetic recording (PMR) technology, while delivering a highly predictable, highly reliable performance unseen in any other SMR implementation. Because host-managed SMR enforces the sequentiality of all incoming data and also provides control at the host level, customers can now intelligently tier their storage from hot-to-cold while maintaining a consistent performance profile regardless of packet size, number of data streams, or workload.

Active archive applications need maximum capacity, low \$/TB, and high data quality with consistent, reliable performance as a secondary requirement. Ha¹⁰ meets all these needs and also delivers enterprise-class characteristics for bit error rate, drive speed and rotational vibration specifications.

Preparing to use Host-Managed SMR

Ultrastar Archive drives are designed specifically for Active Archive environments and will not work as drop-in replacements for traditional capacity enterprise drives. To take advantage of the capacity and predictable performance of host-managed SMR benefits, customers will need to modify their end application or kernel space to interface with new command sets, and data streams must be sequentialized for writing to the drive. The investments made in software changes will also help enable future host-based SMR solutions, and provide a path to future recording technologies.

Feature and Benefits

	Feature / Function	Benefits
Technology	HelioSeal® technology Host-managed SMR	25% boost in capacity, while delivering predictable, consistent performance for enterprise applications.
Capacity	10TB	highest enterprise-grade storage capacity for Active Archive applications
Power Efficiency	Unprecedented Watts/TB	20% improvement in Watts/TB over Ultrastar He8
	Advanced Power Management technology	Additional power savings with instant-on capability
Reliability (Enterprise Grade)	2M hour MTBF	Lower AFR over product life provides for appreciable TCO savings
	5-year warranty	Best-in-class warranty to match enterprise-grade quality
	1 in 10 ¹⁵ unrecoverable bit error rate	SMR with no compromise to data quality and bit integrity
	Rotational Vibration Safeguard (12.5 rad/s ² specification)	Ideal for multi-drive, ultra-dense systems. Works in existing chassis designs.
Performance	600,000 Load/Unload Cycle	Ideal for true Active Archive applications
	7200 RPM	Enterprise-grade performance for enterprise applications
	157MB/s sustained read transfer rate	Consistent, predictable Active Archive workload performance
Security	Conventional zones	Dedicated zones for meta data management
	Self-encrypting Drive (SED) options	Encrypts and safeguards data, providing security and ease of redeployment

Ready for Ultrastar Archive?

To learn more about what's required to get the capacity, predictable performance, and total-cost-of-ownership (TCO) advantages of host-managed SMR drives in your data center, contact your HGST sales representative or visit hgst.com/10TBnow.

How to read the Ultrastar model number

HMH7210A0ALE600 = 10TB, SATA 6Gb/s 512e
 H = HGST
 M = Host-Managed SMR technology
 H = Helium technology
 72 = 7200 RPM
 10 = Full capacity — 10,000GB (10TB)
 A0 = Hexidecimal capacity this model, A0 = 10TB
 A = Generation code
 L = Low-profile 26.1mm z-height
 E6 = Interface;
 E6 = SATA 6Gb/s 512e
 N6 = SATA 6Gb/s 4Kn
 46 = SAS 6Gb/s 4Kn
 0 = Reserved
 0 = Data Security Mode
 0 = Instant Secure Erase
 1 = SED encryption (TCG/SAS, BDE/SATA)
 4 = No encryption, overwrite Secure Erase

Information and Technical Support

www.hgst.com (Main Web site)
www.hgst.com/support (Support Web site)

Learn More

www.hgst.com/10TBnow

Product Specifications

Model # / Part #	HMH7210A0ALE600 HMH7210A0ALE601 HMH7210A0ALE604 HMH7210A0ALN600 HMH7210A0ALN601 HMH7210A0ALN604	HMH7210A0AL4600 HMH7210A0AL4601 HMH7210A0AL4604
Configuration		
Interface	SATA 6Gb/s	SAS 6Gb/s
Capacity ¹ (TB)	10	←
Format: Sector size ³ (bytes)	512e: 512-Byte 4Kn: 4096	4Kn: 4096, 4112, 4160, 4224
Max. Areal density (Gbits/sq. in.)	830	←
Performance		
Data buffer ⁴ (MB)	256	←
Rotational speed (RPM)	7200	←
Latency average (ms)	4.16	←
Interface transfer rate ⁵ (MB/s, max)	600	←
Sustained transfer rate ⁵ (MB/s, typ.)	157 (read), 68 (write)*	←
Seek time ⁶ (read, ms, typical)	8.5**	←
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 ² (M hours)	2.0	←
Warranty (yrs)	5	←
Acoustics		
Idle (Bels, typical)	2.0	←
Power		
Requirement	+5 VDC (+/-5%), +12 VDC (+/-5%)	←
Operating ⁷ (W, typical)	7.6	8.4
Idle ⁸ (W)	5.1	5.7
Power consumption efficiency at Idle (W/TB) (W/GB)	0.51 0.00051	0.57 0.00057
Physical size		
z-height (mm)	26.1	←
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	←
Weight (g, max)	650	←
Environmental (Operating)		
Ambient temperature	10°C to 60°C	←
Shock (half-sine wave, read operation, G)	70 (2ms)	←
Vibration (G RMS 5 to 500 Hz)	0.67, all axes	←
Environmental (Non-Operating)		
Ambient temperature	-40° to 70° C	←
Shock (half-sine wave, G)	300 (1ms) / 150 (11ms)	←
Random vibration (G RMS 2 to 200 Hz)	1.04, all axes	←

* For every write command, verify read of previous track is completed to ensure data reliability to achieve 2M hrs MTBF enterprise-grade reliability and quality while achieving 10TB industry-highest HDD capacity.

** With SMR technology, write is always sequential in an SMR drive. Average seek time for write is not defined.

¹ One TB is equal to 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 drives, the operating system and other factors.

² MTBF target is based on a sample population and is estimated by statistical measurements and acceleration algorithms under nominal operating conditions. MTBF ratings are not intended to predict an individual drive's reliability. MTBF does not constitute a warranty.

³ Sector Size: Advanced Format drive; 4K (4096-byte) physical sectors, 512e provides 512 emulation

⁴ Portion of buffer capacity used for firmware

⁵ One MB/s is equal to 1,000,000 Bytes per second

⁶ Excludes command overhead

⁷ Operating power based on SATA models: 8K Queue Depth of 1, SAS models: 4K Queue Depth of 1

⁸ Idle specification is based on use of Idle_A