Western Digital.

Ultrastar® DC HC330

DATA SHEET

3.5-INCH DATA CENTER HARD DRIVES

10TB | 7200 RPM | 12Gb/s SAS or 6Gb/s SATA

Highlights

- 10TB capacity point supports both OEM & cloud deployments
- Best in Class sustained trasfer rate up to 273MB/s
- Advanced Format 512e models
- Self-Encrypting Drive options
- 5-year limited warranty

Applications & Workloads

- Distributed file systems, like Apache Hadoop®, to support Big Data analytics
- Rack-mounted storage enclosures
- Server based distributed storage systems.
- Direct & Network Attached Storage (DAS & NAS)
- RAID arrays

TCO and Access Speed: Key Requirements for HDDs in the Data Center

As the industry evolves to deploying purpose-built solutions for growing data storage requirements, IT managers can rely on higher capacity HDDs to drive lower $/TB, yet require quick and reliable data access for data center applications. The Ultrastar® DC HC330 10TB[1] hard drives help address these requirements by delivering high capacity storage with nearly 40% performance boost on low queue random depth writes over our prior generation 10TB HDD[2]. This performance boost helps enable capacity scaling and unlocks lower Total Cost of Ownership (TCO). The Ultrastar DC HC330 HDD is designed for a variety of applications including traditional storage arrays, rack-mounted storage enclosures and server based distributed storage systems. The Ultrastar DC HC330 provides fast 7,200 RPM spindle speeds and is offered in either 6Gb/s SATA or 12Gb/s SAS interface with advanced format 512e[3] sector size.

Expanding our Ultrastar HC300 Family to 10TB

The Ultrastar DC HC330 is based on a proven and cost-efficient air-based HDD platform design utilizing six disks and conventional magnetic recording (CMR) technology in a 3.5-inch large form factor. Compared to our prior 10TB product, the DC HC330 delivers the same capacity while using fewer disks. It leverages common hardware and firmware from the existing DC HC300 family of 4TB, 6TB and 8TB capacities and features a second-generation, dual-stage micro actuator to enhance head positioning accuracy for better drive performance. Write performance gains over the prior 10TB are enabled by an improved media cache architecture, that incorporates a flash backed DRAM cache in addition to the existing disk based caching technology that provides a large cache area on the disk media.

Data Security with Trusted Quality, Reliability

New government regulations on data privacy and security requirements drive the need for increased security features on storage devices. The Ultrastar DC HC330 helps protect data from unauthorized use by offering security and encryption options. Both SAS and SATA models offer hardware-based encryption options, which includes both Sanitize Crypto Scramble / Erase functionality and TCG encryption (Trusted Computing Group, Enterprise SSC). Additionally, a FIPS 140–2 Level 2 verified model will be offered for SAS configurations. The Ultrastar DC HC330 extends Western Digital's long-standing tradition of reliability leadership with a 2M-hour MTBF[4] rating, workloads up to 550TB per year, and a 5 year limited warranty.

Features & Benefits

	Feature / Function	Benefits
Capacity	• 10TB • Advanced Format	• Mid capacity point for both traditional IT storage arrays and Cloud server based distributed storage • Enables higher capacity and reliability
Performance	• Non-volatile cache (NVC) • Up to 273MB/s transfer rate	• Improved write performance and write splice protection • Higher performance, more cost-efficient air HDD than previous 10TB helium version with up to 40% performance improvement
Reliability	• Dual-stage Micro Actuator • 2M hours MTBF and 0.44% AFR • 5-year limited warranty	• Better head positioning and rotational vibration robustness • One of the highest reliability ratings for air-filled Capacity Enterprise HDDs

Ultrastar® DC HC330

Specifications

Configuration	SATA Models	SAS Models
Model #	WUS721010ALE6L4 WUS721010ALE6L1	WUS721010AL5204 WUS721010AL5201 WUS721010AL5205
Interface	SATA 6Gb/s	SAS 12Gb/s
Capacity[1]	10TB	←
Form Factor	3.5-inch	←
Sector size (bytes)[3, 5]	512e: 512 4Kn: 4096	512e: 512, 520, 528 4Kn: 4096, 4104, 4160, 4224
Max. areal density (Gbits/sq. in., max)	869	←
Performance		
Data buffer (MB)[6]	256	←
Rotational speed (RPM)	7200	←
Latency average (ms)	4.16	←
Interface transfer rate (MB/s, max)	600	1200
Sustained transfer rate[7] (MiB/sec, typ.) (MB/sec, typ.)	 Up to 260 Up to 273	 ← ←
Seek time (read/write, ms, typ.)[8]	8.0 / 8.6	←
Reliability		
Error Rate (non-recoverable bits read)	1 in 10^{15}	←
Load/Unload cycles (at 40°C)	600,000	←
MTBF[4]	2M hours	←
Annual failure rate (AFR)[4]	0.44%	←
Availability (hrs/day x days/wk)	24×7	←
Limited Warranty (yrs)	5	←

	SATA Models	SAS Models
Acoustics		
Idle/Operating (Bels, typical)	3.4 / 3.8	←
Power		
Requirement	+5V, +12V	←
Operating (W, typical)[9]	9.2	12.4
Idle (W)[10]	8.0	9.0
Physical		
z-height (mm, max)	26.1	←
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	←
Weight (g, max)	750	←
Environmental (operating)		
Ambient Temperature	5°C to 60°C	←
Shock (half-sign wave, 2 ms, G) (Read/Write)	70 / 50	←
Vibration (G RMS, 5 to 500 Hz)	0.67 (XYZ)	←
Environmental (non-operating)		
Ambient Temperature	-40°C to 70°C	←
Shock (half-sign wave, 2 ms, G)	250	←
Vibration (G RMS, 2 to 200 Hz)	1.04 (XYZ)	←

[1] One megabyte (MB) is equal to one million bytes, one gigabyte (GB) is equal to 1,000MB (one billion bytes), and one terabyte (TB) is equal to 1,000GB (one trillion bytes) when referring to storage capacity. Accessible capacity will vary from the stated capacity due to operating environment.

[2] Compared with DC HC510

[3] 512e models can be converted to 4Kn format and vice versa.

[4] MTBF and AFR specifications are based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions for this drive model. MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

[5] Advanced Format drive: 4K (4096-byte) physical sec

[6] Portion of buffer capacity used for drive firmware

[7] Peak values, Actual performance may vary. 1MiB = 1,048,576 bytes (2^{20}), 1MB = 1,000,000 bytes (10^6)

[8] Excludes command overhead

[9] SATA models: 8K Queue Depth = 1 @ 40 IOPS, SAS models: 4K Queue Depth = 4 @ Max IOPS

[10] Idle specification is based on use of Idle_A

How to Read Model Number

WUS721010ALE6L4 – 10TB SATA 6GB/s 512e with Legacy Pin 3 config, Base (SE)

W = Western Digital
U = Ultrastar
S = Standard
72 = 7200 RPM
10 = Max capacity in series (10TB)
10 = Capacity of this model (10TB)
A = Generation code
L = 26.1mm z-height
E6 = Interface (512e SATA 6Gb/s)
(52 = 512e SAS 12Gb/s)

y = Power Disable Pin 3 status
(0 = Power Disable Pin 3 support
L = Legacy Pin 3 config – No Power Disable Support)

z = Data Security Mode
1 = SED*: Self Encrypting Drive. TCG-Enterprise and Sanitize Crypto Scramble / Erase.
4 = Base (SE)*: No Encryption. Sanitize Overwrite only.
5 = SED-FIPS: SED w/ certification (SAS only).

* ATA Security Feature Set comes standard on SATA

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