Ultrastar® DC HC300 Series HDD

10TB[1] | 8TB | 6TB | 4TB | 2TB[9]
7200 RPM | 12Gb/s SAS or 6 Gb/s SATA[9]

Highlights

- 2TB-10TB capacity points support both OEM & cloud deployments as well as traditional IT systems
- Leverages common hardware & firmware to minimize redundant testing needs
- Sustained transfer rate up to 262MB/s
- Advanced Format 4Kn and 512e format[4]
- Self-Encrypting Drive options
- 5-year limited warranty

Applications and 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 storage

Economical Capacities and Fast Data Access Key Requirements for HDDs in the Data Center

IT managers need to offer storage tiers as they deploy purpose-built solutions to meet their on-prem, off-prem & cloud storage requirements. While helium filled drives enable the highest capacities, air-filled drives offer important benefits. With a lower TCA (total cost of acquisition), legacy options, and higher access density (IOPs/TB), they are the perfect choice for maintaining a desired level of performance while allowing customers to tailor budgets to meet their needs.

The Ultrastar® DC HC300-series help to address data center requirements by providing capacities from 2TB to 10TB while increasing performance over prior generations. They are designed for a variety of applications including traditional storage arrays, rack-mounted storage enclosures and server-based distributed storage systems, as well as distributed and scalable computing, including block and file storage architectures. They are offered at 7,200 RPM with either 6Gb/s SATA or 12Gb/s SAS interface in Advanced Format 4Kn and512e format[4]. A 512n option is also available on 4TB models to support legacy systems with native 512-byte block sizes.

Technology Innovation Delivers Efficiency and Performance for Traditional and Legacy Systems

Ultrastar DC HC300-series are based on a proven and cost-efficient air-based HDD platform design, with Conventional Magnetic Recording (CMR) technology in a 3.5-inch large form factor. These HDDs leverage common hardware and firmware while featuring a second-generation, dual-stage microactuator to enhance head positioning accuracy for better drive performance.

Write performance gains are also supported by Western Digital's media cache architecture, a disk-based caching technology that provides a large cache area on the disk, improving reliability and data integrity. Finally, the addition of a flash-based non-volatile cache (NVC) on both SATA and SAS models helps improve write performance.

Data Security with Trusted Quality, Reliability

Compliance and privacy requirements drive the need for increased data security. The Ultrastar DC HC300-series offers security and encryption options to help protect data from unauthorized use, including SED models in both SATA & SAS. An SED-FIPS validated version is available in a SAS configuration. The Ultrastar DC HC300-series extend Western Digital's long-standing tradition of reliability leadership with a 2M-hour MTBF rating, workloads up to 550TB per year, and a 5-year limited warranty.

Features and Benefits

	Feature / Function	Benefits
Capacity	• 2TB, 4TB, 6TB, 8TB, 10TB	• Range of capacities to meet Cloud, OEM and traditional IT workloads and applications • Compatibility with legacy systems
Performance	• Non-volatile cache (NVC) • Up to 262MB/s transfer rate	• Improved write performance
Reliability	• Dual-stage Micro Actuator • 2M hours MTBF and 0.44% AFR • 5-year limited warranty	• Better head positioning and rotational vibration robustness

Ultrastar® DC HC300-Series

Specifications

	SATA Models	SAS Models
Model Numbers	WUS721010ALE6L4 WUS721010ALE6L1	WUS721010AL5204 WUS721010AL5201 WUS721010AL5205
	HUS728T8TALE6L4 HUS728T8TALE6L1	HUS728T8TAL5204 HUS728T8TAL5201 HUS728T8TAL5205
	HUS726T6TALE6L4 HUS726T6TALE6L1	HUS726T6TAL5204 HUS726T6TAL5201 HUS726T6TAL5205
	HUS726T4TALE6L4 HUS726T4TALE6L1 HUS726T4TALA6L4 HUS726T4TALA6L1	HUS726T4TAL5204 HUS726T4TAL5201 HUS726T4TAL5205 HUS726T4TALS204 HUS726T4TALS201 HUS726T4TALS205
	HUS726T2TALA6L4	(N/A 2TB)

Configuration

	SATA Models	SAS Models
Interface	SATA 6Gb/s	SAS 12Gb/s
Capacity[1]	10TB, 8TB, 6TB, 4TB, 2TB	10TB, 8TB, 6TB, 4TB
Form Factor	3.5-inch	←
Sector Size (bytes)[4,5]	512n*/512e: 512 4Kn: 4096	512n*/512e: 512, 520, 528 4Kn: 4096, 4104, 4160, 4224
Max. Areal Density (Gbits/sq. in., max)	869 (10TB) 834 (8TB) 782 (6TB) 696 (4TB) 753 (4TB, 2TB 512n*)	←

Performance

	SATA Models	SAS Models
Data Buffer[5] (MB)	256	←
Rotational Speed (RPM)	7200	←
Latency Average (ms)	4.16	←
Interface Transfer Rate (MB/s, max)	600	1200
Sustained transfer rate[6] (MB/sec, max) / (MiB/sec, max)	273/260 (10TB) 255/243 (8TB, 6TB 4TB-512e/4Kn) 233/222 (4TB, 2TB-512n*)	←

Reliability

	SATA Models	SAS Models
Error Rate (non-recoverable bits read)	1 in 10^{15}	←
Load/Unload Cycles (at 40°C)	600,000	
MTBF[2]	2M hours	←
Annual Failure Rate (AFR)[2]	0.44%	←
Availability (hrs/day x days/wk)	24x7	←
Limited Warranty (yrs)	5	←

Acoustics

	SATA Models	SAS Models
Idle/Operating (Bels, typical)	3.4/3.8 (10TB) 2.9 / 3.6 (8TB, 6TB, 4TB, 2TB)	←

Power

	SATA Models	SAS Models
Requirement	+5V, +12V	←
Operating (W, typical)[7]	9.2 (10TB) 8.8 (8TB) 7.0 (6TB, 4TB, 2TB)	12.4 (10TB) 12.8 (8TB) 12.1 (6TB, 4TB)
Idle (W)[8]	8.0 (10TB) 7.4 (8TB) 5.9 (6TB, 4TB, 2TB)	9.0 (10TB) 8.4 (8TB) 7.0 (6TB, 4TB)

Physical Size

	SATA Models	SAS Models
z-height (mm, max)	26.1	←
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	←
Weight (g, max)	750 (10TB) 715 (8TB, 6TB, 4TB, 2TB)	←

Environmental (Operating)

	SATA Models	SAS Models
Ambient Temperature	5° to 60°C	←
Shock (half-sine wave, 2ms, G) (Read/Write)	70/50 (10TB) 70/70 (8TB, 6TB, 4TB, 2TB)	←
Vibration (G RMS, 5 to 500Hz)	0.67 (XYZ)	←

Environmental (Non-operating)

	SATA Models	SAS Models
Ambient Temperature	-40° to 70°C	←
Shock (half-sine wave, 2ms, G)	250 (10TB) 300 (8TB, 6TB, 4TB, 2TB)	←
Vibration (G RMS, 2 to 200Hz)	1.04 (XYZ)	←

Footnotes

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). Actual user capacity may be less.

2 MTBF and AFR specifications are based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions, workload 220TB/year and temperature 40C. Derating of MTBF and AFR will occur above these parameters, up to 550TB per year and 60°C ambient (65°C device temp). MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

3 Advanced Format drive: 4K (4096-byte) physical sec

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

5 Portion of buffer capacity used for drive firmware

6 Peak values. Actual performance may vary. 1MiB = 1,048,576 bytes (220), 1MB = 1,000,000 bytes (106)

7 SATA models: Random RW 50/50 8KB QD=1 @40 IOPS
SAS models: Random RW 50/50 4KB QD=4 @ Max IOPS

8 Idle specification is based on use of Idle A

9 2TB model available in SATA interface only

How to Read the Ultrastar Model Number

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

U or 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)
(A6* = 512n SATA 6Gb/s)
(S2* = 512n SAS 12Gb/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/ certified validation(SAS only).

* Available on 4TB capacities
** ATA Security Feature Set comes standard on SATA