EXOS ™
ENTERPRISE

SEAGATE

DATA SHEET

Scalable. Responsive. Innovative.
Exos X10

The Seagate® Exos™ X10 hard drive includes 10 TB and 8 TB secure, high-capacity, high-performance enterprise hard drives optimised for demanding hyperscale applications for maximum TCO savings.

Best-Fit Applications

- Hyperscale applications/cloud data centres
- Massive scale-out data centres
- OLTP and HPC applications
- High-capacity density RAID storage
- Mainstream enterprise external storage arrays
- Distributed file systems, including Hadoop and Ceph
- Enterprise backup and restore — D2D, virtual tape
- Centralised surveillance

SEAGATE SECURE ™

Maximum Storage Capacity for High Rack Space Efficiency

The Exos X10 enterprise hard drives support up to 10 TB per drive,[1] providing 25% more petabytes per rack.[2] High storage densities allow the latest technology and greatest efficiencies to help catalyse the datasphere, enabling data centre architects and IT professionals to deliver trusted performance, rock-solid reliability, ironclad security and low TCO for demanding 24×7 operations.

Industry's Highest Performance Combined With the Lowest Power and Weight for Lower TCO

Exos X10 drives offer the industry's highest 10 TB hard drive performance with advanced write caching, making it perfect for OLTP, Hadoop, Ceph and HPC applications. The hyperscale SATA model is tuned for large data transfers and offers a 20% boost in random write performance.[2] Experience the industry's best in IOPS/watt by optimising your storage with Seagate's PowerBalance™ feature.

Innovative Helium Design

The proven, enterprise-class Exos X10 is backed by a 2.5 M-hour MTBF. Built on a wrought-aluminium base, the helium-sealed drive design with no porosity and uniform density is engineered with superior material and a wide-weld design, and utilises the latest hermetic interconnect technology to support higher data rate heads and higher pin counts to excel in extreme thermal conditions in a robust storage infrastructure. These Seagate X class hard drives provide digital environmental sensors that measure internal humidity, pressure and temperature, to help ensure high reliability and performance.

Enhanced Enterprise Reliability, Data Protection and Security

The Exos X10 hard drives offer advanced security features that help protect data where it lives — on the drive. Advanced security levels to prevent unauthorised access to a drive and safeguard stored data include Seagate Downloads & Diagnostics, TCG-compliant Self-Encrypting Drive and government-grade FIPS/Common Criteria tamper-resistant hard drive.[3] Seagate Secure™ drives simplify drive repurposing and disposal, help protect data-at-rest, and comply with corporate and federal data security mandates.

1 Seagate recommends validating your configuration with your HBA/RAID controller manufacturer to ensure full capacity capabilities.
2 Compared to 8 TB competitive product.
3 Self-Encrypting Drives (SED) are not available for all models or countries. May require TCG-compliant host or controller support.

Specifications	SATA 6 Gb/s Hyperscale		SATA 6 Gb/s Standard	
Capacity	10 TB	8 TB	10 TB	8 TB
Standard Model (512e)[1]	—	—	ST10000NM0086	ST8000NM0206
Hyperscale Model (512e)[1]	ST10000NM0016	ST8000NM0016	—	—
Standard Model (4Kn)[1]	—	—	ST10000NM0146	—
SED Model (512e)[1,2]	—	—	ST10000NM0156	—
SED Model (4Kn)[1,2]	—	—	ST10000NM0166	—
SED-FIPS/Common Criteria Model (512e)[1,2,3]	—	—	ST10000NM0176	—
SED-FIPS/Common Criteria Model (4Kn)[1,2,3]	—	—	ST10000NM0186	—
Features				
Helium Sealed-Drive Design With Wide Weld	Yes	Yes	Yes	Yes
Digital Environmental Sensors	Yes	Yes	Yes	Yes
Protection Information (T10 DIF)	—	—	—	—
SuperParity	Yes	Yes	Yes	Yes
PowerChoice™/PowerBalance™ Technology	Yes	Yes	Yes	Yes
Low Halogen/Hot-Plug Support[4]	Yes	Yes	Yes	Yes
Cache, Multi-segmented (MB)	256	256	256	256
Organic Solderability Preservative	Yes	Yes	Yes	Yes
Reliability/Data Integrity				
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000	2,500,000	2,500,000
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%	0.35%	0.35%	0.35%
Non-recoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24×7)	8,760	8,760	8,760	8,760
512e Sector Size (Bytes per Sector)	512	512	512	512
4Kn Sector Size (Bytes per Sector)	—	—	4,096	4,096
Limited Warranty (years)	5	5	5	5
Performance				
Spindle Speed (RPM)	7,200	7,200	7,200	7,200
Interface Access Speed (Gb/s)	6.0, 3.0, 1.5	6.0, 3.0, 1.5	6.0, 3.0, 1.5	6.0, 3.0, 1.5
Max. Sustained Transfer Rate OD (MB/s)	249MB/s	249MB/s	249MB/s	249MB/s
Random Read/Write 4K QD16 WCD (IOPS)	170, 138	170, 138	170, 370	170, 370
Average Latency (ms)	4.16	4.16	4.16	4.16
Interface Ports	Single	Single	Single	Single
Rotational Vibration @ 1,500 Hz (rad/s²)	12.5	12.5	12.5	12.5
Power Consumption				
Idle A (W) Average	4.5 W	4.5 W	5 W	5 W
Max Operating Power, Random Write (WCD) 4K/4Q RR50% / RW50%	8.0	8.0	8.0	8.0
Max Operating Power, Random Read 4K/16Q (W)	8.4	8.4	8.4	8.4
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V
Environmental				
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C	5°C – 60°C	5°C – 60°C
Vibration, Non-operating: 10 Hz to 500 Hz (Grms)	2.27	2.27	2.27	2.27
Shock, Operating 2 ms (Read/Write) (Gs)	70/40 Gs	70/40 Gs	70/40 Gs	70/40 Gs
Shock, Non-operating, 1 ms/2 ms (Gs)	250	250	250	250
Physical				
Height (mm/in, max)[5]	26.11 mm/1.028 in	26.11 mm/1.028 in	26.11 mm/1.028 in	26.11 mm/1.028 in
Width (mm/in, max)[5]	101.85 mm/4.01 in	101.85 mm/4.01 in	101.85 mm/4.01 in	101.85 mm/4.01 in
Depth (mm/in, max)[5]	147 mm/5.787 in	147 mm/5.787 in	147 mm/5.787 in	147 mm/5.787 in
Weight (lb/g)	650 g/1.433 lb	650 g/1.433 lb	650 g/1.433 lb	650 g/1.433 lb
Carton Unit Quantity	20	20	20	20
Cartons per Pallet / Cartons per Layer	40/8	40/8	40/8	40/8

1 Invoice SPA required for most SED and SED-FIPS models.

2 Self-Encrypting Drives (SED) and FIPS 140-2 Validated drives are not available in all models or countries; may require TCG-compliant host or controller support.

3 See FIPS 140-2 Level 2 Certificate at: http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2011.htm#1635

4 Supports Hotplug operation per Serial ATA Revision 2.6 specification.

5 These base deck dimensions conform to the Small Form Factor Standard (SFF-8301) found at www.sffcommittee.org. For connector-related dimensions, see SFF-8323.

Specifications	12 Gb/s SAS Standard	
Capacity	10 TB	8 TB
Standard Model (512e)[1]	ST10000NM0096	ST8000NM0156
Hyperscale Model (512e)[1]	—	—
Standard Model (4Kn)[1]	ST10000NM0206	—
SED Model (512e)[1,2]	ST10000NM0216	—
SED Model (4Kn)[1,2]	ST10000NM0226	—
SED-FIPS/Common Criteria Model (512e)[1,2,3]	ST10000NM0236	—
SED-FIPS/Common Criteria Model (4Kn)[1,2,3]	ST10000NM0246	—
Features		
Helium Sealed-Drive Design With Wide Weld	Yes	Yes
Digital Environmental Sensors	Yes	Yes
Protection Information (T10 DIF)	Yes	Yes
SuperParity	Yes	Yes
PowerChoice™/PowerBalance™ Technology	Yes	Yes
Low Halogen/Hot-Plug Support[4]	Yes	Yes
Cache, Multi-segmented (MB)	256	256
Organic Solderability Preservative	Yes	Yes
Reliability/Data Integrity		
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%	0.35%
Non-recoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24×7)	8,760	8,760
512e Sector Size (Bytes per Sector)	512, 520, 528	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4,096, 4,160, 4,224	4,096, 4,160, 4,224
Limited Warranty (years)	5	5
Performance		
Spindle Speed (RPM)	7,200	7,200
Interface Access Speed (Gb/s)	12.0, 6.0, 3.0	12.0, 6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s)	249MB/s	249MB/s
Random Read/Write 4K QD16 WCD (IOPS)	170, 370	170, 370
Average Latency (ms)	4.16	4.16
Interface Ports	Dual	Dual
Rotational Vibration @ 1,500 Hz (rad/s²)	12.5	12.5
Power Consumption		
Idle A (W) Average	6 W	5.5 W
Max Operating Power, Random Write (WCD) 4K/4Q RR50% / RW50%	9.0	9.0
Max Operating Power, Random Read 4K/16Q (W)	9.4	9.4
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V
Environmental		
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C
Vibration, Non-operating: 10 Hz to 500 Hz (Grms)	2.27	2.27
Shock, Operating 2 ms (Read/Write) (Gs)	70/40 Gs	70/40 Gs
Shock, Non-operating, 1 ms/2 ms (Gs)	250	250
Physical		
Height (mm/in, max)[5]	26.11 mm/1.028 in	26.11 mm/1.028 in
Width (mm/in, max)[5]	101.85 mm/4.01 in	101.85 mm/4.01 in
Depth (mm/in, max)[5]	147 mm/5.787 in	147 mm/5.787 in
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Carton Unit Quantity	20	20
Cartons per Pallet / Cartons per Layer	40/8	40/8

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