



DATA SHEET

Scalable. Responsive. Innovative.  
**Exos X10**



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



### Best-Fit Applications

- Hyperscale applications/cloud data centers
- Massive scale-out data centers
- 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
- Centralized surveillance



### Maximum Storage Capacity for High Rack Space Efficiency

The Exos X10 enterprise hard drives support up to 10TB per drive,<sup>1</sup> providing 25% more petabytes per rack.<sup>2</sup> High storage densities allow the latest technology and greatest efficiencies to help catalyze the datasphere, enabling data center architects and IT professionals to deliver trusted performance, rock-solid reliability, ironclad security and low TCO for demanding 24x7 operations.

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

Exos X10 drives offer the industry's highest 10TB 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.<sup>2</sup> Experience the industry's best in IOPS/watt by optimizing your storage with Seagate's PowerBalance™ feature.

### Innovative Helium Design

The proven, enterprise-class Exos X10 is backed by a 2.5M-hour MTBF. Built on a wrought-aluminum base, the helium-sealed drive design with no porosity and uniform density is engineered with superior material and a wide-weld design, and utilizes 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 unauthorized 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.<sup>3</sup> Seagate Secure™ drives simplify drive repurposing and disposal, help protect data-at-rest, and comply with corporate and federal data security mandates.

<sup>1</sup> Seagate recommends validating your configuration with your HBA/RAID controller manufacturer to ensure full capacity capabilities.

<sup>2</sup> Compared to 8TB competitive product.

<sup>3</sup> Self-Encrypting Drives (SED) are not available in all models or countries. May require TCG-compliant host or controller support.



Specifications	SATA 6Gb/s Hyperscale		SATA 6Gb/s Standard	
Capacity	10TB	8TB	10TB	8TB
Standard Model (512e) <sup>1</sup>	—	—	ST10000NM0086	ST8000NM0206
Hyperscale Model (512e) <sup>1</sup>	ST10000NM0016	ST8000NM0016	—	—
Standard Model (4Kn) <sup>1</sup>	—	—	ST10000NM0146	—
SED Model (512e) <sup>1,2</sup>	—	—	ST10000NM0156	—
SED Model (4Kn) <sup>1,2</sup>	—	—	ST10000NM0166	—
SED-FIPS/Common Criteria Model (512e) <sup>1,2,3</sup>	—	—	ST10000NM0176	—
SED-FIPS/Common Criteria Model (4Kn) <sup>1,2,3</sup>	—	—	ST10000NM0186	—
<b>Features</b>				
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 <sup>4</sup>	Yes	Yes	Yes	Yes
Cache, Multisegmented (MB)	256	256	256	256
Organic Solderability Preservative	Yes	Yes	Yes	Yes
<b>Reliability/Data Integrity</b>				
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000	2,500,000	2,500,000
Reliability Rating @ Full 24x7 Operation (AFR)	0.35%	0.35%	0.35%	0.35%
Nonrecoverable 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 (24x7)	8,760	8,760	8,760	8,760
512e Sector Size (Bytes per Sector)	512	512	512	512
4Kn Sector Size (Bytes per Sector)	—	—	4096	4096
Limited Warranty (years)	5	5	5	5
<b>Performance</b>				
Spindle Speed (RPM)	7200	7200	7200	7200
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 @ 1500Hz (rad/s <sup>2</sup> )	12.5	12.5	12.5	12.5
<b>Power Consumption</b>				
Idle A (W) Average	4.5W	4.5W	5W	5W
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
<b>Environmental</b>				
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C	5°C – 60°C	5°C – 60°C
Vibration, Nonoperating: 10Hz to 500Hz (Grms)	2.27	2.27	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	70/40Gs	70/40Gs	70/40Gs	70/40Gs
Shock, Nonoperating, 1ms/2ms (Gs)	250	250	250	250
<b>Physical</b>				
Height (mm/in, max) <sup>5</sup>	26.11mm/1.028in	26.11mm/1.028in	26.11mm/1.028in	26.11mm/1.028in
Width (mm/in, max) <sup>5</sup>	101.85mm/4.01in	101.85mm/4.01in	101.85mm/4.01in	101.85mm/4.01in
Depth (mm/in, max) <sup>5</sup>	147mm/5.787in	147mm/5.787in	147mm/5.787in	147mm/5.787in
Weight (g/lb)	650g/1.433lb	650g/1.433lb	650g/1.433lb	650g/1.433lb
Carton Unit Quantity	20	20	20	20
Cartons per Pallet/Cartons per Layer	40 / 8	40 / 8	40 / 8	40 / 8

<sup>1</sup> Invoice SPA required for most SED and SED-FIPS models.

<sup>2</sup> 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.

<sup>3</sup> 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](http://www.sffcommittee.org). For connector-related dimensions, see SFF-8323.



Specifications	12Gb/s SAS Standard	
	10TB	8TB
Capacity	10TB	8TB
Standard Model (512e) <sup>1</sup>	ST10000NM0096	ST8000NM0156
Hyperscale Model (512e) <sup>1</sup>	—	—
Standard Model (4Kn) <sup>1</sup>	ST10000NM0206	—
SED Model (512e) <sup>1,2</sup>	ST10000NM0216	—
SED Model (4Kn) <sup>1,2</sup>	ST10000NM0226	—
SED-FIPS/Common Criteria Model (512e) <sup>1,2,3</sup>	ST10000NM0236	—
SED-FIPS/Common Criteria Model (4Kn) <sup>1,2,3</sup>	ST10000NM0246	—
<b>Features</b>		
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 <sup>4</sup>	Yes	Yes
Cache, Multisegmented (MB)	256	256
Organic Solderability Preservative	Yes	Yes
<b>Reliability/Data Integrity</b>		
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000
Reliability Rating @ Full 24x7 Operation (AFR)	0.35%	0.35%
Nonrecoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24x7)	8,760	8,760
512e Sector Size (Bytes per Sector)	512, 520, 528	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4096, 4160, 4224	4096, 4160, 4224
Limited Warranty (years)	5	5
<b>Performance</b>		
Spindle Speed (RPM)	7200	7200
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 @ 1500Hz (rad/s <sup>2</sup> )	12.5	12.5
<b>Power Consumption</b>		
Idle A (W) Average	6W	5.5W
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
<b>Environmental</b>		
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C
Vibration, Nonoperating: 10Hz to 500Hz (Grms)	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	70/40Gs	70/40Gs
Shock, Nonoperating, 1ms/2ms (Gs)	250	250
<b>Physical</b>		
Height (mm/in, max) <sup>5</sup>	26.11mm/1.028in	26.11mm/1.028in
Width (mm/in, max) <sup>5</sup>	101.85mm/4.01in	101.85mm/4.01in
Depth (mm/in, max) <sup>5</sup>	147mm/5.787in	147mm/5.787in
Weight (g/lb)	650g/1.433lb	650g/1.433lb
Carton Unit Quantity	20	20
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