DATA SHEET

Scalable. Responsive. Innovative.

Exos X16

Seagate manufactures hard drives that specifically address the needs of the hyperscale storage market. As the flagship of the Seagate® X class, the Exos® X16 enterprise hard drives are the highest-capacity hard drives in the fleet.

Best-Fit Applications

- Hyperscale applications/cloud data centers
- Massive scale-out data centers
- Big data 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 Highest Rack Space Efficiency

Industry's first 16TB drive for 33% more petabytes per rack[1]

Highest 16TB hard drive performance with enhanced caching, making it perfect for cloud data center and massive scale-out data center applications

Hyperscale SATA model tuned for large data transfers and low latency

PowerBalance™ feature optimizes Watts/TB

Helium sealed-drive design delivers lower total cost of ownership through lower power and weight

Next-generation helium side-sealing weld technology for added handling robustness and leak protection

Digital environmental sensors to monitor internal drive conditions for optimal operation and performance

Data protection and security: Seagate Secure™ features for safe, affordable, fast, and easy drive retirement

Proven enterprise-class reliability backed by **5-year limited warranty and 2.5M-hr MTBF rating**

1 Compared to 12TB competitive product

Specifications	SATA 6Gb/s	12Gb/s SAS	SATA 6Gb/s	12Gb/s SAS
Capacity	14TB	16TB	16TB	14TB
Standard Model FastFormat™ (512e/4Kn)[1]	ST14000NM001G	ST16000NM002G	ST16000NM001G	ST14000NM002G
SED Model FastFormat (512e/4Kn)[1,2]	ST14000NM003G	ST16000NM004G	ST16000NM003G	ST14000NM004G
SED-FIPS FastFormat (512e/4Kn)[1,2]	—	ST16000NM009G	—	ST14000NM012G
Features				
Helium Sealed-Drive Design	Yes	Yes	Yes	Yes
Protection Information (T10 DIF)	—	Yes	—	Yes
SuperParity	Yes	Yes	Yes	Yes
Low Halogen	Yes	Yes	Yes	Yes
PowerChoice™ Idle Power Technology	Yes	Yes	Yes	Yes
PowerBalance™ Power/Performance Technology	Yes	Yes	Yes	Yes
Hot-Plug Support[3]	Yes	Yes	Yes	Yes
Cache, Multisegmented (MB)	256	256	256	256
Organic Solderability Preservative	Yes	Yes	Yes	Yes
RSA 2048 Firmware Verification (SD&D)	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%
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 (24×7)	8,760	8,760	8,760	8,760
512e Sector Size (Bytes per Sector)	512	512, 520, 528	512	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4096	4096, 4160, 4224	4096	4096, 4160, 4224
Limited Warranty (years)	5	5	5	5
Performance				
Spindle Speed (RPM)	7200RPM	7200RPM	7200RPM	7200RPM
Interface Access Speed (Gb/s)	6.0, 3.0	12.0, 6.0, 3.0	6.0, 3.0	12.0, 6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s,MiB/s)	261, 249	261, 249	261, 249	261, 249
Random Read/Write 4K QD16 WCD (IOPS)	170/440	170/440	170/440	170/440
Average Latency (ms)	4.16	4.16	4.16	4.16
Interface Ports	Single	Dual	Single	Dual
Rotation Vibration @ 20-1500 Hz (rad/sec²)	12.5	12.5	12.5	12.5
POWER CONSUMPTION				
Idle A (W) Average	5W	5W	5W	5W
Max Operating, Random Read/Write 4K/16Q (W)	10.0, 6.3	10.2, 6.2	10.0, 6.3	10.2, 6.2
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, Nonoperating: 2 to 500Hz (Grms)	2.27	2.27	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	50	50	50	50
Shock, Nonoperating 2ms (GS)	200	200	200	200
Physical				
Height (mm/in, max)[4]	26.11mm/1.028in	26.11mm/1.028in	26.11mm/1.028in	26.11mm/1.028in
Width (mm/in, max)[4]	101.85mm/4.01in	101.85mm/4.01in	101.85mm/4.01in	101.85mm/4.01in
Depth (mm/in, max)[4]	147mm/5.787in	147mm/5.787in	147mm/5.787in	147mm/5.787in
Weight (g/lb)	670g/1.477lb	670g/1.477lb	670g/1.477lb	670g/1.477lb
Carton Unit Quantity	20	20	20	20
Cartons per Pallet/Cartons per Layer	40/8	40/8	40/8	40/8

1 FastFormat models ship in 512e format state. When switching from 512e to 4Kn by executing the FastFormat routine, all data on the drive will be deleted. Note that data must be aligned to 4K sectors to see improved performance in 4Kn fomat.

2 Self-Encrypting Drives (SED) and FIPS 140-2 Validated drives available through franchised authorized distributors. May require TCG-compliant host or controller support.

3 Supports Hotplug operation per Serial ATA Revision 3.2 specification

4 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.

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