EXOS ENTERPRISE

SEAGATE

Scalable. Responsive. Innovative.

Exos X14 and Exos X14z

Seagate manufactures hard drives that specifically address the needs of the hyperscale storage market. As the flagship of the Seagate® X class, the Exos™ X14 and Exos X14z enterprise hard drives is the highest-capacity hard drive in the fleet.

14TB
Exos™ X14
ST14000NM0428

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

14TB per drive[1] for 40% more petabytes per rack

Industry's lowest power and weight for optimum data center TCO

Highest 14TB hard drive performance with enhanced caching, making it perfect for big data applications

Hyperscale SATA model tuned for large data transfers

PowerBalance™ feature optimizes IOPS/Watt

Helium sealed-drive design with no porosity and uniform density

Superior material and weld-width design for a more robust, hermetically sealed-drive enclosure that protects from helium leaks

Digital environmental sensors for measuring internal pressure, helping to ensure high reliability, performance, and quality

Latest hermetic interconnect technology supporting higher data rate heads and higher pin counts for extreme thermal conditions

Proven enterprise-class reliability backed by **2.5M-hr MTBF rating**

1 Compared to 10TB competitive product

Specifications	SATA 6Gb/s	12Gb/s SAS	SATA 6Gb/s	12Gb/s SAS	SATA 6Gb/s
Capacity	14TB	14TB	12TB	12TB	10TB
Hyperscale (512e)	—	—	—	—	—
Hyperscale (4Kn)	—	—	—	—	—
Standard Model FastFormat™ (512e/4Kn)[1]	ST14000NM0018	ST14000NM0048	ST12000NM0008	ST12000NM0038	ST10000NM0478
SED Model FastFormat (512e/4Kn)[1,2]	ST14000NM0258	ST14000NM0288	ST12000NM0248	ST12000NM0278	ST10000NM0568
SED-FIPS FastFormat (512e/4Kn)[1,2]	—	ST14000NM0378	—	ST12000NM0368	—
Features					
Helium Sealed-Drive Design	Yes	Yes	Yes	Yes	Yes
Protection Information (T10 DIF)	—	Yes	—	Yes	—
Super Parity	Yes	Yes	Yes	Yes	Yes
Low Halogen	Yes	Yes	Yes	Yes	Yes
PowerChoice™ Idle Power Technology	Yes	Yes	Yes	Yes	Yes
PowerBalance™ Power/Performance Technology	Yes	Yes	Yes	Yes	Yes
Hot-Plug Support[3]	Yes	Yes	Yes	Yes	Yes
Cache, Multisegmented (MB)	256	256	256	256	256
Organic Solderability Preservative	Yes	Yes	Yes	Yes	Yes
RSA 2048 Firmware Verification (SD&D)	Yes	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	2,500,000
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%	0.35%	0.35%	0.35%	0.35%
Nonrecoverable Read Errors per Bits Read, Max	1 sector per 10E15	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	8,760
512e Sector Size (Bytes per Sector)	512	512, 520, 528	512	512, 520, 528	512
4Kn Sector Size (Bytes per Sector)	4096	4096, 4160, 4224	4096	4096, 4160, 4224	4096
Limited Warranty (years)	5	5	5	5	5
Performance					
Spindle Speed (RPM)	7200RPM	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	6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s,MiB/s)	261, 249	261, 249	245, 233	245, 233	245, 233
Random Read/Write 4K QD16 WCD (IOPS)	170/418	170/418	170/418	170/418	170/418
Average Latency (ms)	4.16	4.16	4.16	4.16	4.16
Interface Ports	Single	Dual	Single	Dual	Single
Rotation Vibration @ 20-1500 Hz (rad/sec²)	12.5	12.5	12.5	12.5	12.5
POWER CONSUMPTION					
Idle Average (W)	5W	5W	5W	5W	5W
Max Operating, Random Read/Write 4K/16Q (W)	10.0, 6.0	10.2, 6.2	10.0, 6.0	10.2, 6.2	9.8, 5.8
Power Supply Requirements	+12 V and +5 V	+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	5°C – 60°C
Vibration, Nonoperating: 2 to 500Hz (Grms)	2.27	2.27	2.27	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	70/40Gs	70/40Gs	70/40Gs	70/40Gs	70/40Gs
Shock, Nonoperating 2ms (GS)	250	250	250	250	250
Physical					
Height (mm/in, max)[4]	26.11mm/1.028in	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	101.85mm/4.01in
Depth (mm/in, max)[4]	147mm/5.787in	147mm/5.787in	147mm/5.787in	147mm/5.787in	147mm/5.787in
Weight (g/lb)	690g/1.521lb	690g/1.521lb	690g/1.521lb	690g/1.521lb	690g/1.521lb
Carton Unit Quantity	20	20	20	20	20
Cartons per Pallet/Cartons per Layer	40/8	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 3.3 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.

Specifications	12Gb/s SAS
Capacity	10TB
Hyperscale (512e)	—
Hyperscale (4Kn)	—
Standard Model FastFormat™ (512e/4Kn)[1]	ST10000NM0528
SED Model FastFormat (512e/4Kn)[1,2]	ST10000NM0578
SED-FIPS FastFormat (512e/4Kn)[1,2]	ST10000NM0608
Features	
Helium Sealed-Drive Design	Yes
Protection Information (T10 DIF)	Yes
Super Parity	Yes
Low Halogen	Yes
PowerChoice™ Idle Power Technology	Yes
PowerBalance™ Power/Performance Technology	Yes
Hot-Plug Support[3]	Yes
Cache, Multisegmented (MB)	256
Organic Solderability Preservative	Yes
RSA 2048 Firmware Verification (SD&D)	Yes
Reliability/Data Integrity	
Mean Time Between Failures (MTBF, hours)	2,500,000
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%
Nonrecoverable Read Errors per Bits Read, Max	1 sector per 10E15
Power-On Hours per Year (24×7)	8,760
512e Sector Size (Bytes per Sector)	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4096, 4160, 4224
Limited Warranty (years)	5
Performance	
Spindle Speed (RPM)	7200RPM
Interface Access Speed (Gb/s)	12.0, 6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s,MiB/s)	245, 233
Random Read/Write 4K QD16 WCD (IOPS)	170/418
Average Latency (ms)	4.16
Interface Ports	Dual
Rotation Vibration @ 20-1500 Hz (rad/sec²)	12.5
POWER CONSUMPTION	
Idle Average (W)	5W
Max Operating, Random Read/Write 4K/16Q (W)	10.2, 6.2
Power Supply Requirements	+12 V and +5 V
Environmental	
Temperature, Operating (°C)	5°C – 60°C
Vibration, Nonoperating: 2 to 500Hz (Grms)	2.27
Shock, Operating 2ms (Read/Write) (Gs)	70/40Gs
Shock, Nonoperating 2ms (GS)	250
Physical	
Height (mm/in, max)[4]	26.11mm/1.028in
Width (mm/in, max)[4]	101.85mm/4.01in
Depth (mm/in, max)[4]	147mm/5.787in
Weight (g/lb)	690g/1.521lb
Carton Unit Quantity	20
Cartons per Pallet/Cartons per Layer	40/8

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