

Data Sheet

Constellation™ ES

High-capacity storage designed for seamless enterprise integration

2TB, 1TB and 500GB • 7200RPM •

3.5-inch form factor • 6Gb/s SAS and SATA 3Gb/s

Key Advantages

- Fourth-generation, enterprise, nearline drive designed for 24x7 operation
- Up to 2TB capacity for data-hungry enterprise business applications
- Best-in-class enhanced rotational vibration tolerance ensures unrivalled performance in high-density applications for continuous data access.
- Enhanced efficiencies with PowerChoice™ host-selectable power options for unprecedented savings (up to 92 percent) during slow or idle periods
- Proven reliability with multi-drive firmware maximized for enterprise system availability
- Robust performance with dual processor technology and ramp load technology (35 percent average sustained throughput increase over previous generation)
- Provides business sustainability with Seagate Unified Storage architecture
 - 6Gb/s SAS performance with error detection and correction (IOEDC/IOECC) capabilities for the ultimate in data integrity
 - Government-grade Self-Encrypting Drive (SED) option for TCG-compliant/AES-128 security cuts IT drive retirement costs while securely protecting data.¹

Best-Fit Applications

- High-capacity data center storage
- Storage area networks (SAN), network attached storage (NAS) and direct attached storage (DAS)
- Enterprise backup and restore—D2D, virtual tape
- Centralized surveillance
- Cloud storage



¹ SED option for SAS models only. Requires TCG-compliant host or controller support.



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Specifications	SAS 2.0			SATA		
	2TB ¹	1TB ¹	500GB ¹	2TB ¹	1TB ¹	500GB ¹
Model Number	ST32000444SS ST32000445SS ²	ST31000424SS ST31000425SS ²	ST3500414SS ST3500415SS ²	ST32000644NS	ST31000524NS	ST3500514NS
Interface	6Gb/s SAS, 3GB/s SAS	6Gb/s SAS, 3GB/s SAS	6Gb/s SAS, 3GB/s SAS	SATA 3GB/s, SATA 1.5Gb/s	SATA 3Gb/s, SATA 1.5Gb/s	SATA 3Gb/s, SATA 1.5Gb/s
Self-Encrypting Drive (SED) Government Grade Security	Yes	Yes	Yes	—	—	—
Performance						
Spindle Speed (RPM)	7200	7200	7200	7200	7200	7200
Seek Time						
Average Read/Write (ms)	8.5/9.5	8.5/9.5	8.5/9.5	8.5/9.5	8.5/9.5	8.5/9.5
Track-to-Track Read/Write (ms)	0.5/0.8	0.5/0.8	0.5/0.8	0.5/0.8	0.5/0.8	0.5/0.8
Maximum Sustained Transfer Rate (MB/s)	150	150	150	140	140	140
Cache, Multisegmented (MB)	16	16	16	64	32	32
Configuration/Organization						
Bytes per Sector	512, 520, 524, 528	512, 520, 524, 528	512, 520, 524, 528	512	512	512
Reliability/Data Integrity						
Power-On Hours (annual)	8760	8760	8760	8760	8760	8760
Mean Time Between Failures (MTBF, hours)	1.2 million	1.2 million	1.2 million	1.2 million	1.2 million	1.2 million
Reliability Rating at Full 24x7 Operation (AFR)	0.73%	0.73%	0.73%	0.73%	0.73%	0.73%
Nonrecoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15
IOEDC (I/O Error Detection Code)	Yes	Yes	Yes	Yes	Yes	Yes
IOECC (I/O Error Correction Code)	Reads/Writes	Reads/Writes	Reads/Writes	Writes	Writes	Writes
Load/Unload Cycles (at 40°C)	300,000	300,000	300,000	300,000	300,000	300,000
Interface Ports	Dual	Dual	Dual	Single	Single	Single
Limited Warranty (years)	5	5	5	5	5	5
Power Management						
Power Supply Requirements	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V
Idle (W)	8.0	6.0	5.6	7.0	5.0	4.6
Typical Operating Power (W)						
Random Read	12.2	10.8	10.4	11.2	9.8	9.4
Random Write	11.2	9.6	9.2	10.2	8.6	8.2
PowerChoice™ Option (W)	As low as 1.26	As low as 1.30	As low as 1.28	As low as 0.53	As low as 0.57	As low as 0.55
Environmental						
Rotational Vibration @ 1500 Hz (rad/sec ²)	12.5	12.5	12.5	12.5	12.5	12.5
Shock, 2ms (Gs)						
Operating	70	70	70	70	70	70
Nonoperating	300	350	350	300	350	350
Temperature (°C)						
Operating	5 to 60	5 to 60	5 to 60	5 to 60	5 to 60	5 to 60
Nonoperating	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Acoustics Idle (bels, typical)	2.7	2.2	1.9	2.7	2.2	1.9
Physical						
Height (in/mm)	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1
Width (in/mm)	4.0/101.6	4.0/101.6	4.0/101.6	4.0/101.6	4.0/101.6	4.0/101.6
Depth (in/mm)	5.787/146.99	5.787/146.99	5.787/146.99	5.787/146.99	5.787/146.99	5.787/146.99
Weight (lb/kg)	1.565/0.71	1.411/0.64	1.345/0.61	1.543/0.70	1.344/0.61	1.289/0.585

¹ One gigabyte, or GB, equals one billion bytes and one terabyte, or TB, equals one trillion bytes when referring to hard drive capacity.
² SED option for SAS models only. Requires TCG-compliant host or controller support.

www.seagate.com

1-800-SEAGATE (1-800-732-4283)

AMERICAS Seagate Technology LLC 920 Disc Drive, Scotts Valley, California 95066, United States, 831-438-6550
 ASIA/PACIFIC Seagate Singapore International Headquarters Pte. Ltd. 7000 Ang Mo Kio Avenue 5, Singapore 569877, 65-6485-3888
 EUROPE, MIDDLE EAST AND AFRICA Seagate Technology SAS 16-18 rue de Dôme, 92100 Boulogne-Billancourt, France, 33 1-4186 10 00

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