

Data Sheet

Constellation® ES.2

**3TB capacity-optimized enterprise hard drive
for bulk-data applications**

**3TB¹ • 7200 RPM • 3.5-inch form factor •
6Gb/s SAS and SATA 6Gb/s •
Self-Encrypting Drive option**

Key Advantages

- Highest-capacity enterprise drive for sustaining demanding data growth
- Fifth-generation capacity-optimized drive designed for 24x7 reliability
- SAS-based, end-to-end data integrity and enhanced error correction for accurate data storage
- Best-in-class enhanced rotational vibration tolerance ensures consistent performance.
- Improved power and cooling efficiencies with low power consumption and enhanced PowerChoice™ technology
- Multi-drive firmware maximized for enterprise system availability
- Robust performance with dual processor and ramp load technologies
- Self-Encrypting Drive (SED) option (AES-256) cuts IT drive retirement costs while securely protecting data where it lives—on the drive.²
- FIPS (140-2) option provides all the benefits of SED and meets U.S., Canada and U.K. government data encryption compliance requirements.^{2,3}

Best-Fit Applications

- High-capacity bulk-data storage
- Mainstream enterprise external storage arrays (SAN, NAS, DAS)
- Enterprise backup and restore—D2D, virtual tape
- Centralized surveillance
- Cloud storage



¹ Seagate recommends validating your configuration with your HBA/RAID controller manufacturer to ensure full 3TB capacity capabilities.

² Self-Encrypting Drive (SED) and FIPS Self-Encrypting Drive options require TCG-compliant host or controller support. Not available in all countries.

³ Certification pending. See FIPS 140-2 Level 2 Certification at <http://csrc.nist.gov/groups/STM/cmvp/documents/14-1/1401vend.htm>



Constellation® ES.2

3TB capacity-optimized enterprise hard drive
for bulk-data applications



Specifications	6Gb/s SAS	SATA 6Gb/s
	3TB ^{1,2}	3TB ^{1,2}
Standard Model Number	ST33000650SS	ST33000650NS
SED (AES-256) Model Number	ST33000651SS ³	ST33000651NS ³
Features		
Protection Information	Yes	—
Low Halogen	Yes	Yes
Cache, Multisegmented (MB)	64	64
Reliability/Data Integrity		
Mean Time Between Failures (MTBF, hours)	1.2 million	1.2 million
Reliability Rating @ Full 24x7 Operation (AFR)	0.73%	0.73%
Nonrecoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year	8760	8760
Bytes per Sector	512, 520, 528	512
Limited Warranty (years)	5	5
Performance		
Spindle Speed (RPM)	7200	7200
Interface Access Speed (Gb/s)	6.0, 3.0, 1.5	6.0, 3.0, 1.5
Max. Sustained Transfer Rate (MB/s)	155	155
Seek Time, Average Read/Write (ms)	8.5/9.5	8.5/9.5
Average Latency (ms)	4.16	4.16
Interface Ports	Dual	Single
Rotational Vibration @ 1500 Hz (rad/sec ²)	12.5	12.5
Power Consumption		
Idle (W)	7.4	7.7
Typical Operating, Random Read (W)	11.3	10.7
Power Supply Requirements	+12V and +5V	+12V and +5V
PowerChoice™ Technology	Yes	Yes
Environmental		
Temperature, Operating (°C)	5 to 60	5 to 60
Vibration, Nonoperating: <5Hz to 500Hz (G rms)	4.9	4.9
Shock, Operating, 2ms (Read/Write) (Gs)	70/40	70/40
Shock, Nonoperating, 1ms and 2ms (Gs)	300	300
Physical		
Height (in/mm, max) ⁴	1.028/26.10	1.028/26.10
Width (in/mm, max) ⁴	4.010/101.85	4.010/101.85
Depth (in/mm, max) ⁴	5.787/147.00	5.787/147.00
Weight (lb/g)	1.543/700	1.543/700
Carton Unit Quantity	20	20
Cartons per Pallet	40	40
Cartons per Layer	8	8

1 One gigabyte, or GB, equals one billion bytes and one terabyte, or TB, equals one trillion bytes when referring to drive capacity.

2 Seagate recommends validating your configuration with your HBA/RAID controller manufacturer to ensure full 3TB capacity capabilities.

3 Self-Encrypting Drive model; requires TCG-compliant host or controller support. Not available in all countries.

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.

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 du Dôme, 92100 Boulogne-Billancourt, France, 33 1-4186 10 00