

Constellation® ES.3

Data Sheet

Capacity-Optimized Enterprise Hard Drive for Bulk-Data Applications

- Highest-capacity large form factor enterprise drive—up to 4TB—for demanding data growth¹
- Sixth-generation drive technology with SAS and SATA interfaces for 24x7 reliability
- Enhanced error correction, super parity and end-to-end SAS-based data integrity for accurate data storage
- Industry-leading rotational vibration tolerance ensures consistent performance.
- Improved power and cooling efficiencies with low power consumption and on-demand PowerChoice™ technology based on T10/T13 power management standards
- Multi-drive firmware maximized for enterprise RAID system availability
- Robust performance with dual processors, ramp load technology, top-coverattached motor and humidity sensor for optimum performance in all chassis
- Self-Encrypting Drive (AES-256) with FIPS 140-2 validation and Seagate Instant Secure Erase cuts IT drive retirement costs while securely protecting data at rest.^{2,3}

Best-Fit Applications

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



 $^{1.} Seagate\ recommends\ validating\ your\ configuration\ with\ your\ HBA/RAID\ controller\ manufacturer\ to\ ensure\ full\ capacity\ capabilities.$

3 See FIPS 140-2 Level 2 Certificate at http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2011.htm#1635

² 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.

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Caraifications	SATA 6Gb/s				
Specifications	4TB ^{1, 2}	3TB ^{1,2}	2TB¹	1TB¹	
Standard Model Number	ST4000NM0033	ST3000NM0033	ST2000NM0033	ST1000NM0033	
SED Model Number	ST4000NM00533	ST3000NM00533	ST2000NM00533	ST1000NM00533	
SED FIPS Model Number	ST4000NM0073 ^{3,4}				
Features					
Humidity Sensor	Yes	Yes	Yes	Yes	
Super Parity	Yes	Yes	Yes	Yes	
Low Halogen	Yes	Yes	Yes	Yes	
PowerChoice™ Technology	Yes	Yes	Yes	Yes	
Cache, Multisegmented (MB)	128	128	128	128	
Reliability/Data Integrity					
Mean Time Between Failures (MTBF, hours)	2.0M	2.0M	2.0M	2.0M	
Reliability Rating @ Full 24x7 Operation (AFR)	0.44%	0.44%	0.44%	0.44%	
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	8760 (24×7)	8760 (24×7)	8760 (24×7)	8760 (24×7)	
Bytes per Sector	512 Native	512 Native	512 Native	512 Native	
Limited Warranty (years) ⁵	5	5	5	5	
Performance					
Spindle Speed (RPM)	7200	7200	7200	7200	
Max. Sustained Transfer Rate OD (MB/s)	175	175	175	175	
Average Latency (ms)	4.16	4.16	4.16	4.16	
Interface Ports	Single	Single	Single	Single	
Rotational Vibration @ 1500 Hz (rad/s²)	12.5	12.5	12.5	12.5	
Power Consumption					
Idle Power (W)	6.73	6.73	5.17	4.45	
Typical Operating, Random Read (W)	11.27	11.27	9.42	8.08	
Power Supply Requirements	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V	
Environmental					
Temperature, Operating (°C)	5 to 60	5 to 60	5 to 60	5 to 60	
Vibration, Nonoperating: <5Hz to 500Hz (Gs)	0.25	0.25	0.25	0.25	
Shock, Operating, 2ms (Read/Write) (Gs)	70/40	70/40	70/40	70/40	
Shock, Nonoperating, 1ms and 2ms (Gs)	300	300	300	300	
Physical					
Height (in/mm, max) ⁶	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	
Width (in/mm, max) ⁶	4.010/101.85	4.010/101.85	4.010/101.85	4.010/101.85	
Depth (in/mm, max) ⁶	5.878/147.0	5.878/147.0	5.878/147.0	5.878/147.0	
Weight (lb/g)	1.543/700	1.444/655	1.400/635	1.334/605	
Carton Unit Quantity	20	20	20	20	
Cartons per Pallet	40	40	40	40	
Cartons per Layer	8	8	8	8	

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



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

³ 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.

⁴ FIPS 140-2 in review. See FIPS 140-2 Level 2 Certificate at: http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2011.htm#1635

⁵ Capacity-optimized products shipped between December 31, 2011 and June 30, 2012, have a 3-year limited warranty. Capacity-optimized products shipped before December 31, 2011 or after June 30, 2012 have a 5-year limited warranty.

⁶ These base deck dimensions conform to the Small Form Factor Standard (SFF-8201) found at www.sffcommittee.org. For connector-related dimensions, see SFF-8223.

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Considerations	6Gb/s SAS				
Specifications	4TB ^{1, 2}	3TB1,2	2TB ¹	1TB¹	
Standard Model Number	ST4000NM0023	ST3000NM0023	ST2000NM0023	ST1000NM0023	
SED Model Number	ST4000NM0043 ³	ST3000NM0043 ³	ST2000NM0043 ³	ST1000NM0043 ³	
SED-FIPS Model Number	ST4000NM0063 ^{3,4}	ST3000NM0063 ^{3,4}	ST2000NM0063 ^{3,4}	ST1000NM0063 ^{3,4}	
Features					
Protection Information (T10 DIF)	Yes	Yes	Yes	Yes	
Humidity Sensor	Yes	Yes	Yes	Yes	
Super Parity	Yes	Yes	Yes	Yes	
Low Halogen	Yes	Yes	Yes	Yes	
PowerChoice™ Technology	Yes	Yes	Yes	Yes	
Cache, Multisegmented (MB)	128	128	128	128	
Reliability/Data Integrity					
Mean Time Between Failures (MTBF, hours)	2.0M	2.0M	2.0M	2.0M	
Reliability Rating @ Full 24x7 Operation (AFR)	0.44%	0.44%	0.44%	0.44%	
Nonrecoverable Read Errors per Bits Read	1 sector per 10E15				
Power-On Hours per Year	8760	8760	8760	8760	
Bytes per Sector	512, 520, 528	512, 520, 528	512, 520, 528	512, 520, 528	
Limited Warranty (years) ⁵	5	5	5	5	
Performance					
Spindle Speed (RPM)	7200	7200	7200	7200	
Max. Sustained Transfer Rate OD (MB/s)	175	175	175	175	
Average Latency (ms)	4.16	4.16	4.16	4.16	
Interface Ports	Dual	Dual	Dual	Dual	
Rotational Vibration @ 1500 Hz (rad/s²)	12.5	12.5	12.5	12.5	
Power Consumption					
Idle Power (W)	7.80	6.74	5.78	4.84	
Typical Operating, Random Read (W)	11.86	10.72	9.59	8.93	
Power Supply Requirements	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V	
Environmental					
Temperature, Operating (°C)	5 to 60	5 to 60	5 to 60	5 to 60	
Vibration, Nonoperating: <5Hz to 500Hz (Gs)	0.25	0.25	0.25	0.25	
Shock, Operating, 2ms (Read/Write) (Gs)	70/40	70/40	70/40	70/40	
Shock, Nonoperating, 1ms and 2ms (Gs)	300	300	300	300	
Physical					
Height (in/mm, max) ⁶	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	
Width (in/mm, max) ⁶	4.010/101.85	4.010/101.85	4.010/101.85	4.010/101.85	
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Weight (lb/g)	1.543/700	1.444/655	1.400/635	1.334/605	
Carton Unit Quantity	20	20	20	20	
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