

# Constellation<sup>®</sup> 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 growth<sup>1</sup>
- 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
- Best-in-class 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-cover-attached 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.<sup>2,3</sup>

## 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

<sup>1</sup> Seagate recommends validating your configuration with your HBA/RAID controller manufacturer to ensure full capacity capabilities.

<sup>2</sup> 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.

<sup>3</sup> 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>



| Specifications                                     | SATA 6Gb/s                |                           |                           |                           |
|--|---------------------------|---------------------------|---------------------------|---------------------------|
|  | 4TB <sup>1,2</sup>        | 3TB <sup>1,2</sup>        | 2TB <sup>1</sup>          | 1TB <sup>1</sup>          |
| Standard Model Number                              | ST4000NM0033              | ST3000NM0033              | ST2000NM0033              | ST1000NM0033              |
| SED Model Number                                   | ST4000NM0053 <sup>3</sup> | ST3000NM0053 <sup>3</sup> | ST2000NM0053 <sup>3</sup> | ST1000NM0053 <sup>3</sup> |
| <b>Features</b>                                    |                           |                           |                           |                           |
| 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                       |
| <b>Reliability/Data Integrity</b>                  |                           |                           |                           |                           |
| Mean Time Between Failures (MTBF, hours)           | 1.4 million               | 1.4 million               | 1.4 million               | 1.4 million               |
| Reliability Rating @ Full 24x7 Operation (AFR)     | 0.63%                     | 0.63%                     | 0.63%                     | 0.63%                     |
| 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 (24x7)               | 8760 (24x7)               | 8760 (24x7)               | 8760 (24x7)               |
| Bytes per Sector                                   | 512 Native                | 512 Native                | 512 Native                | 512 Native                |
| Limited Warranty (years) <sup>4</sup>              | 5                         | 5                         | 5                         | 5                         |
| <b>Performance</b>                                 |                           |                           |                           |                           |
| 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                    |
| Rotation Vibration @ 1500 Hz (rad/s <sup>2</sup> ) | 12.5                      | 12.5                      | 12.5                      | 12.5                      |
| <b>Power Consumption</b>                           |                           |                           |                           |                           |
| 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              |
| <b>Environmental</b>                               |                           |                           |                           |                           |
| 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                       |
| <b>Physical</b>                                    |                           |                           |                           |                           |
| Height (in/mm, max) <sup>5</sup>                   | 1.028/26.1                | 1.028/26.1                | 1.028/26.1                | 1.028/26.1                |
| Width (in/mm, max) <sup>5</sup>                    | 4.010/101.85              | 4.010/101.85              | 4.010/101.85              | 4.010/101.85              |
| Depth (in/mm, max) <sup>5</sup>                    | 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 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.

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



| Specifications                                     | 6Gb/s SAS                   |                             |                             |                             |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|  | 4TB <sup>1,2</sup>          | 3TB <sup>1,2</sup>          | 2TB <sup>1</sup>            | 1TB <sup>1</sup>            |
| Standard Model Number                              | ST4000NM0023                | ST3000NM0023                | ST2000NM0023                | ST1000NM0023                |
| SED Model Number                                   | ST4000NM0043 <sup>3</sup>   | ST3000NM0043 <sup>3</sup>   | ST2000NM0043 <sup>3</sup>   | ST1000NM0043 <sup>3</sup>   |
| SED-FIPS Model Number                              | ST4000NM0063 <sup>3,4</sup> | ST3000NM0063 <sup>3,4</sup> | ST2000NM0063 <sup>3,4</sup> | ST1000NM0063 <sup>3,4</sup> |
| <b>Features</b>                                    |                             |                             |                             |                             |
| 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                         |
| <b>Reliability/Data Integrity</b>                  |                             |                             |                             |                             |
| Mean Time Between Failures (MTBF, hours)           | 1.4 million                 | 1.4 million                 | 1.4 million                 | 1.4 million                 |
| Reliability Rating @ Full 24x7 Operation (AFR)     | 0.63%                       | 0.63%                       | 0.63%                       | 0.63%                       |
| 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                        | 8760                        | 8760                        | 8760                        |
| Bytes per Sector                                   | 512, 520, 528               | 512, 520, 528               | 512, 520, 528               | 512, 520, 528               |
| Limited Warranty (years) <sup>5</sup>              | 5                           | 5                           | 5                           | 5                           |
| <b>Performance</b>                                 |                             |                             |                             |                             |
| 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                        |
| Rotation Vibration @ 1500 Hz (rad/s <sup>2</sup> ) | 12.5                        | 12.5                        | 12.5                        | 12.5                        |
| <b>Power Consumption</b>                           |                             |                             |                             |                             |
| 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                |
| <b>Environmental</b>                               |                             |                             |                             |                             |
| 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                         |
| <b>Physical</b>                                    |                             |                             |                             |                             |
| Height (in/mm, max) <sup>6</sup>                   | 1.028/26.1                  | 1.028/26.1                  | 1.028/26.1                  | 1.028/26.1                  |
| Width (in/mm, max) <sup>6</sup>                    | 4.010/101.85                | 4.010/101.85                | 4.010/101.85                | 4.010/101.85                |
| Depth (in/mm, max) <sup>6</sup>                    | 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                           |

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