

WD Red[®] Pro

Enterprise-class hard drives engineered to deliver high performance and reliability.



NAS HARD DRIVES

WD Red[®] Pro drives are engineered to handle high-intensity workloads in 24x7 multi-user commercial and enterprise NAS environments. WD Red Pro drives deliver the performance, scalability and dependability businesses require to store, share and collaborate on large amounts of data in multi-bay RAID-optimized NAS systems.

Product Highlights

- Available in capacities ranging from 2TB to 22TB¹
- For RAID-optimized NAS systems with unlimited # of bays
- Rated for 550TB/year workloads² and up to 2.5M hours MTBF³



Ideal for:

- Multimedia Creative Pros
- Medium to Large Businesses
- Commercial and Enterprise NAS systems

Tuned for NAS with NASware™

Western Digital's exclusive NASware™ technology **fine tunes drive parameters** to match NAS system workloads which helps increase performance and reliability.

Designed for Continuous Operation

WD Red Pro hard drives are designed to handle the rigorous demands of high- intensity **24x7 multi-user NAS environments** and increase system durability.

Tested for Dependable Compatibility

Western Digital partners with a wide range of NAS system vendors for **extensive testing** to ensure compatibility with most NAS enclosures.

Protected against Excessive Vibration

WD Red Pro drives include **Rotation Vibration (RV) sensors** that anticipate and proactively counteract disturbances caused by increased vibration. By dispersing excess vibration across the drive chassis, turbulence is minimized, performance is maintained and drives are protected.

Built to Absorb Shock

WD Red Pro hard drives include a **multi-axis shock sensor** to detect subtle shock events and automatically compensate with **dynamic fly height technology** to further protect the drives in NAS enclosures.

Engineered with Industry-Leading Technology

WD Red Pro 22TB¹ hard drives feature Western Digital's proprietary Opti-NAND™ technology which leverages **integrated iNAND embedded flash** to perform key housekeeping functions, freeing up more capacity and improving the overall drive performance.

Specifications

| Model Number ⁴ | WD221KFGX | WD201KFGX | WD181KFGX | WD161KFGX | WD142KFGX | WD141KFGX | WD121KFBX |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Formatted capacity ¹ | 22TB | 20TB | 18TB | 16TB | 14TB | 14TB | 12TB |
| Recording technology | CMR | CMR | CMR | CMR | CMR | CMR | CMR |
| Interface | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s |
| Form factor | 3.5-inch | 3.5-inch | 3.5-inch | 3.5-inch | 3.5-inch | 3.5-inch | 3.5-inch |
| Native command queuing | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| OptiNAND™ technology | Yes | Yes | No | No | No | No | No |
| Advanced Format (AF) | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RoHS compliant ⁵ | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Performance | | | | | | | |
| Interface speed (max) | 6 Gb/s | 6 Gb/s | 6 Gb/s | 6 Gb/s | 6 Gb/s | 6 Gb/s | 6 Gb/s |
| Internal transfer rate ⁶ | 265 MB/s | 268 MB/s | 272 MB/s | 259 MB/s | 265 MB/s | 255 MB/s | 240 MB/s |
| Cache (MB) ¹ | 512 | 512 | 512 | 512 | 512 | 512 | 256 |
| RPM | 7200 | 7200 | 7200 | 7200 | 7200 | 7200 | 7200 |
| Reliability/Data Integrity | | | | | | | |
| Load/unload cycles ⁷ | 600,000 | 600,000 | 600,000 | 600,000 | 600,000 | 600,000 | 600,000 |
| Non-recoverable errors per bits read | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ | <1 in 10 ¹⁴ | <1 in 10 ¹⁵ |
| MTBF (hours) ⁸ | 2,500,000 | 2,500,000 | 2,500,000 | 2,500,000 | 2,500,000 | 2,500,000 | 2,000,000 |
| Workload rate (TB/year) ² | 550 | 550 | 550 | 550 | 550 | 550 | 550 |
| Limited warranty (years) ³ | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Power Management⁹ | | | | | | | |
| 12VDC ±5% (A, peak) | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 |
| 5VDC ±5% (A, peak) | | | | | | | |
| Average power requirements (W) | | | | | | | |
| Read/Write | 6.8 | 6.9 | 6.1 | 6.1 | 6.4 | 6.2 | 6.0 |
| Idle | 3.4 | 3.8 | 3.6 | 3.6 | 3.6 | 3.0 | 2.8 |
| Standby and Sleep | 1.2 | 1.6 | 0.9 | 0.9 | 0.9 | 0.8 | 0.6 |
| Environmental Specifications | | | | | | | |
| Temperature (°C) | | | | | | | |
| Operating | 0 to 65 | 0 to 65 | 0 to 65 | 0 to 65 | 0 to 65 | 0 to 65 | 0 to 65 |
| Non-operating | -40 to 70 | -40 to 70 | -40 to 70 | -40 to 70 | -40 to 70 | -40 to 70 | -40 to 70 |
| Shock (Gs) | | | | | | | |
| Operating, (2 ms, read/write) | 40 | 30 | 30 | 30 | 30 | 30 | 30 |
| Operating, (2 ms, read) | 40 | 50 | 50 | 50 | 50 | 65 | 65 |
| Non-operating (2 ms) | 200 | 250 | 250 | 250 | 250 | 300 | 300 |
| Acoustics (dBA) | | | | | | | |
| Idle | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Seek (average) | 32 | 32 | 36 | 36 | 36 | 36 | 36 |
| Physical Dimensions | | | | | | | |
| Height (in./mm, max) | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 |
| Length (in./mm, max) | 5.787/147 | 5.787/147 | 5.787/147 | 5.787/147 | 5.787/147 | 5.787/147 | 5.787/147 |
| Width (in./mm, ± .01 in.) | 4/101.6 | 4/101.6 | 4/101.6 | 4/101.6 | 4/101.6 | 4/101.6 | 4/101.6 |
| Weight (lb/kg, ± 10%) | 1.48/0.67 | 1.52/0.69 | 1.52/0.69 | 1.52/0.69 | 1.52/0.69 | 1.52/0.69 | 1.46/0.66 |

Specifications

| Model Number ⁴ | WD102KFBX | WD8003FFBX | WD6003FFBX | WD4003FFBX | WD2002FFSX |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Formatted capacity ¹ | 10TB | 8TB | 6TB | 4TB | 2TB |
| Recording technology | CMR | CMR | CMR | CMR | CMR |
| Interface | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s | SATA 6 Gb/s |
| Form factor | 3.5-inch | 3.5-inch | 3.5-inch | 3.5-inch | 3.5-inch |
| Native command queuing | Yes | Yes | Yes | Yes | Yes |
| OptiNAND™ technology | No | No | No | No | No |
| Advanced Format (AF) | Yes | Yes | Yes | Yes | Yes |
| RoHS compliant ⁵ | Yes | Yes | Yes | Yes | Yes |
| Performance | | | | | |
| Interface speed (max) | 6 Gb/s | 6 Gb/s | 6 Gb/s | 6 Gb/s | 6 Gb/s |
| Internal transfer rate ⁶ | 265 MB/s | 235 MB/s | 238 MB/s | 217 MB/s | 164 MB/s |
| Cache (MB) ¹ | 256 | 256 | 256 | 256 | 64 |
| RPM | 7200 | 7200 | 7200 | 7200 | 7200 |
| Reliability/Data Integrity | | | | | |
| Load/unload cycles ⁷ | 600,000 | 600,000 | 600,000 | 600,000 | 600,000 |
| Non-recoverable errors per bits read | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ | <1 in 10 ¹⁵ |
| MTBF (hours) ⁸ | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 |
| Workload rate (TB/year) ² | 550 | 550 | 550 | 550 | 550 |
| Limited warranty (years) ³ | 5 | 5 | 5 | 5 | 5 |
| Power Management⁹ | | | | | |
| 12VDC ±5% (A, peak) | 1.75 | 2.08 | 1.79 | 1.79 | 1.9 |
| 5VDC ±5% (A, peak) | | | | | |
| Average power requirements (W) | | | | | |
| Read/Write | 8.4 | 8.8 | 7.2 | 7.2 | 7.8 |
| Idle | 4.6 | 4.6 | 3.7 | 3.7 | 6.0 |
| Standby and Sleep | 0.5 | 0.7 | 0.4 | 0.4 | 1.4 |
| Environmental Specifications | | | | | |
| Temperature (°C) | | | | | |
| Operating | 0 to 65 | 0 to 65 | 0 to 65 | 0 to 65 | 0 to 65 |
| Non-operating | -40 to 70 | -40 to 70 | -40 to 70 | -40 to 70 | -40 to 70 |
| Shock (Gs) | | | | | |
| Operating, (2 ms, read/write) | 30 | 30 | 30 | 30 | 30 |
| Operating, (2 ms, read) | 65 | 65 | 65 | 65 | 65 |
| Non-operating (2 ms) | 250 | 300 | 300 | 300 | 300 |
| Acoustics (dBA) | | | | | |
| Idle | 34 | 29 | 29 | 29 | 29 |
| Seek (average) | 38 | 36 | 36 | 36 | 31 |
| Physical Dimensions | | | | | |
| Height (in./mm, max) | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 | 1.028/26.1 |
| Length (in./mm, max) | 5.787/147 | 5.787/147 | 5.787/147 | 5.787/147 | 5.787/147 |
| Width (in./mm, ± .01 in.) | 4/101.6 | 4/101.6 | 4/101.6 | 4/101.6 | 4/101.6 |
| Weight (lb/kg, ± 10%) | 1.65/0.75 | 1.58/0.72 | 1.58/0.72 | 1.58/0.72 | 1.58/0.72 |

¹ 1MB = 1 million bytes, 1GB = 1 billion bytes and 1TB = 1 trillion bytes. Actual user capacity may be less depending on operating environment.

² Annualized Workload Rate = TB transferred x (8760 / recorded power-on hours). The maximum rated workload is specified for operating at typical temperature of 40C. Workload Rate will vary depending on your hardware and software components and configurations.

³ See <http://support.wd.com/warranty> for regionally specific warranty details.

⁴ Not all products may be available in all regions of the world.

⁵ This drive is in compliance with the European Union Directive 2011/65/EU and Directive (EU) 2015/863 on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment.

⁶ Up to stated speed. 1 MB/s = 1 million bytes per second. Based on internal testing; performance may vary depending upon host device, usage conditions, drive capacity, and other factors.

⁷ Controlled unload at ambient condition.

⁸ Projected Values. When final, MTBF are based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions, workload of 220TB/year and drive temperature of 40C. Derating of MTBF will occur above these parameters, up to 550TB writes per year. MTBF do not predict an individual drive's reliability and do not constitute a warranty.

⁹ Power measurements at room-ambient temperature.

