# Hard Disk Sentinel

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# Monitor/Protect Data

- Evolution: cassette, 5 ¼ and 3.5 floppies
- …then rotating memory hard drives
- SSDs increasingly replace rotating drives
- Hard drives and SSDs taken for granted
- They reliably/rapidly save/fetch data
- Until – uh oh, something's wrong

# Hard Disk Sentinel (HDS)

- I use on two computers: tower and laptop
- Constantly monitors drive health
- Reports ultra-details on structure/operation
- Supports
  - Rotating hard drives
  - Solid state drives (SSD)
  - Hybrid (rotating plus SSD) drives
  - Memory cards, thumb drives, RAID controllers

# Display

- I configure taskbar icon for each drive
  - One on laptop, two on tower (internal, external)
  - Shows temperature green/orange/red
  - Mouse over displays drive health summary
  - Click icon opens comprehensive display



```
Disk: #1 - WDC WD20NMVW-11EDZS3 - D: - OK
Hard Disk Temperature: 93 °F
Health: 100 %
```

# HDS Comfort Level and Details

- Desired summary: The hard disk status is PERFECT. Problematic or weak sectors were not found and there are no spin up or data transfer errors. No actions needed.

- Can explore drive history: temperature patterns, various errors, performance information, and much more.

# HDS Main Display -- SSD
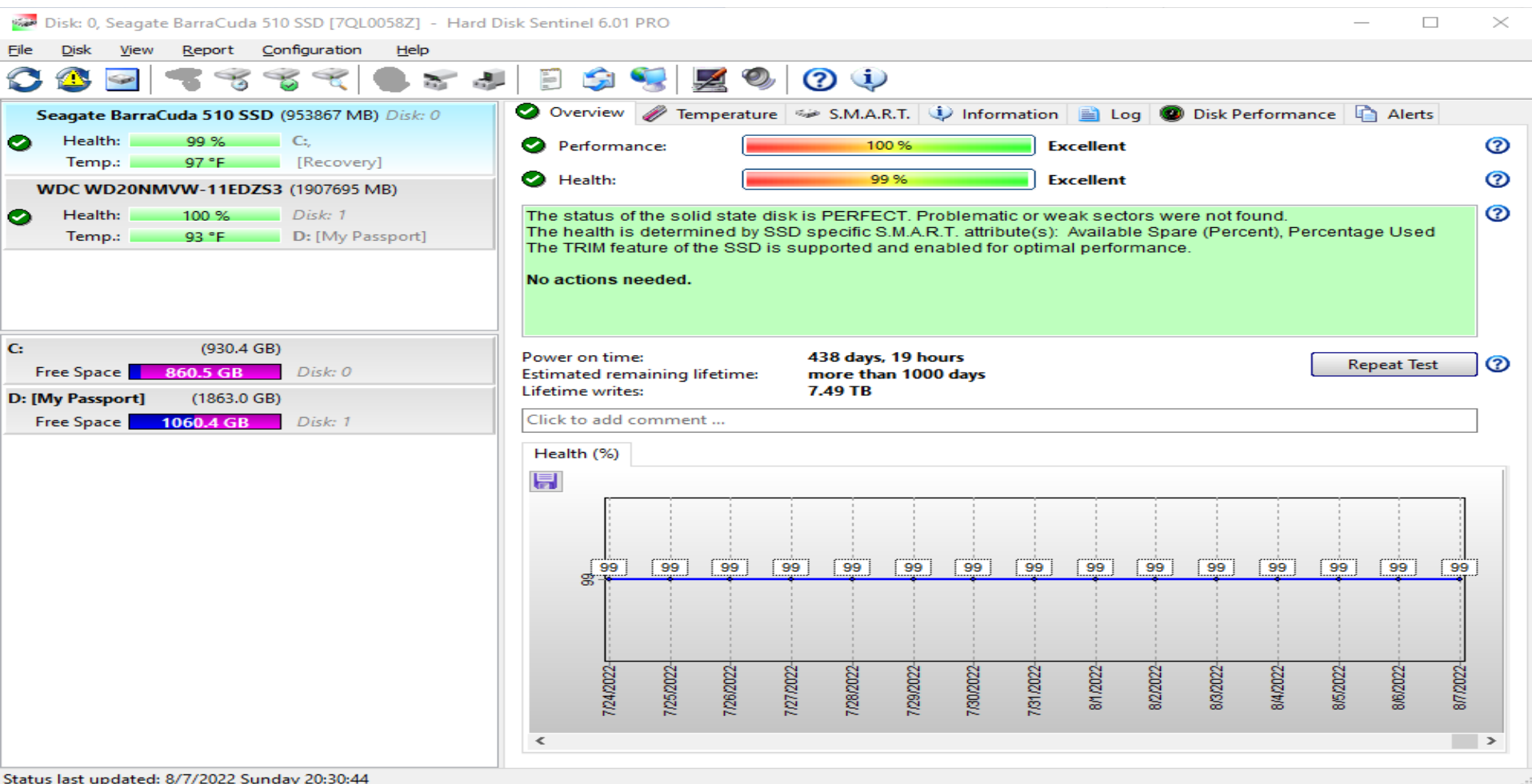
# Note SSD Lifetime Writes

| Date | Terabytes | Bytes | Difference | Days | Bytes/day |
|---|---|---|---|---|---|
| 6/13/2021 | 0.668 | 668,000,000 | | | |
| 6/15/2021 | 0.696 | 696,000,000 | 28,000,000 | 2 | 14,000,000 |
| 6/19/2021 | 0.752 | 752,000,000 | 56,000,000 | 4 | 14,000,000 |
| 6/23/2021 | 0.824 | 824,000,000 | 72,000,000 | 4 | 18,000,000 |
| 7/16/2021 | 1.010 | 1,010,000,000 | 186,000,000 | 23 | 8,086,957 |
| 7/25/2021 | 1.010 | 1,010,000,000 | 0 | 9 | 0 |
| 8/10/2021 | 1.100 | 1,100,000,000 | 90,000,000 | 16 | 5,625,000 |
| 8/18/2021 | 1.110 | 1,110,000,000 | 10,000,000 | 8 | 1,250,000 |
| 1/16/2022 | 3.520 | 3,520,000,000 | 2,410,000,000 | 151 | 15,960,265 |
| 1/23/2022 | 3.630 | 3,630,000,000 | 110,000,000 | 7 | 15,714,286 |
| 2/1/2022 | 3.840 | 3,840,000,000 | 210,000,000 | 9 | 23,333,333 |
| 2/7/2022 | 3.970 | 3,970,000,000 | 130,000,000 | 6 | 21,666,667 |
| 2/17/2022 | 4.150 | 4,150,000,000 | 180,000,000 | 10 | 18,000,000 |
| 2/27/2022 | 4.330 | 4,330,000,000 | 180,000,000 | 10 | 18,000,000 |
| 3/16/2022 | 4.690 | 4,690,000,000 | 360,000,000 | 17 | 21,176,471 |
| 4/10/2022 | 5.200 | 5,200,000,000 | 510,000,000 | 25 | 20,400,000 |
| 4/22/2022 | 5.430 | 5,430,000,000 | 230,000,000 | 12 | 19,166,667 |
| 5/23/2022 | 6.060 | 6,060,000,000 | 630,000,000 | 31 | 20,322,581 |
| 6/24/2022 | 6.630 | 6,630,000,000 | 570,000,000 | 32 | 17,812,500 |
| 7/26/2022 | 7.180 | 7,180,000,000 | 550,000,000 | 32 | 17,187,500 |
| 9/5/2022 | 8.020 | 8,020,000,000 | 840,000,000 | 41 | 20,487,805 |

- SSDs wear out, have finite write capacities
- Investigate excessive writes, indicated by decreasing health

# Crucial Storage Executive

Software that helps optimize performance of Crucial SSD: This free downloadable tool enables Crucial SSD to be even faster and allows it to get periodic updates so it's performing at its best. With Storage Executive, you can see how much storage is used, download latest firmware, monitor drive temperature, reset encryption password, and enable Momentum Cache feature, which makes many SSD operations up to 10x faster
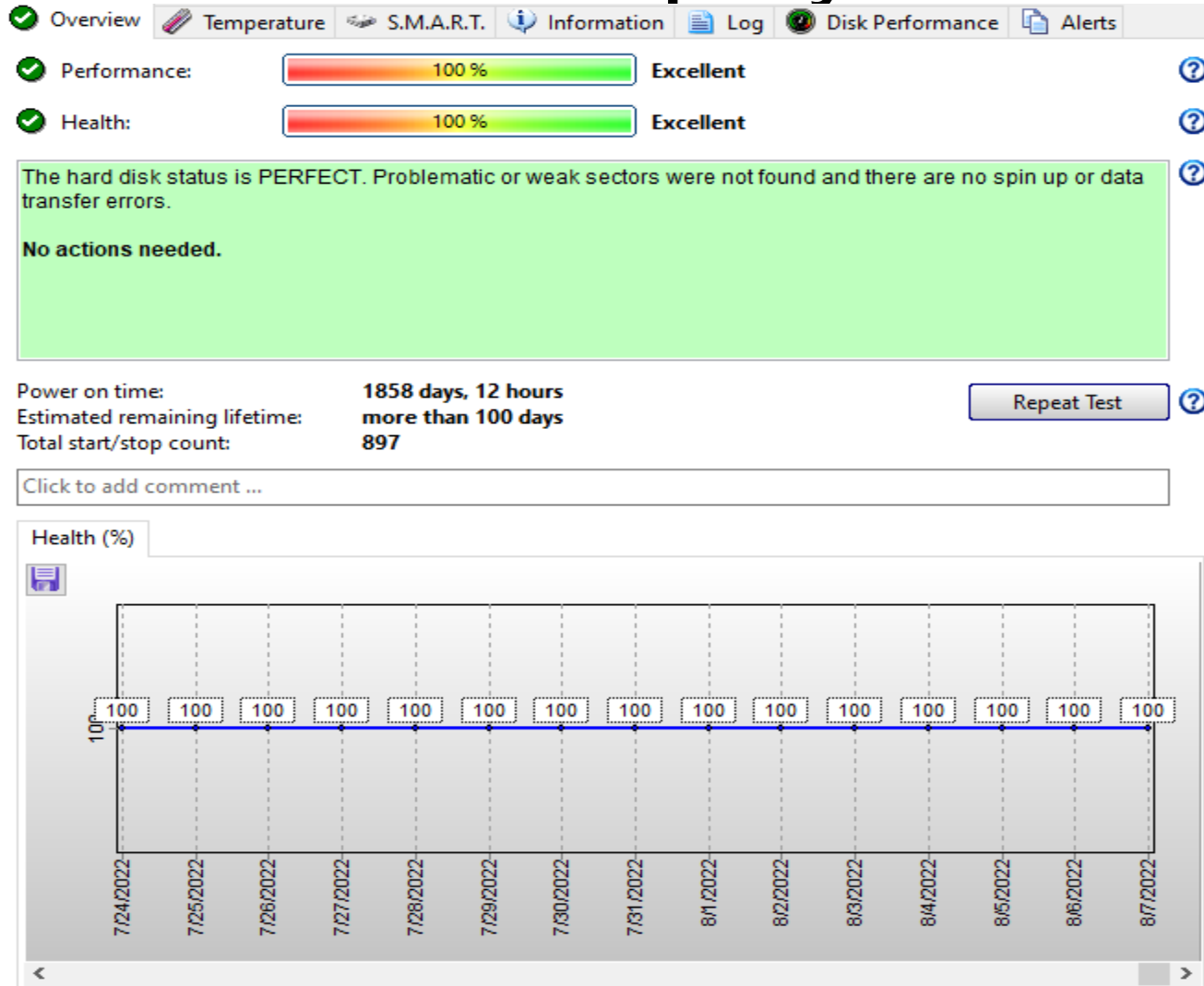
Benefits of Storage Executive:

•Enable Momentum Cache feature to make many operations up to 10x faster
•Download latest firmware
•See how much storage is used
•Monitor SSD operating temperature and overall health
•Reset SSD encryption password
•Verify SSD's model number for warranty claims
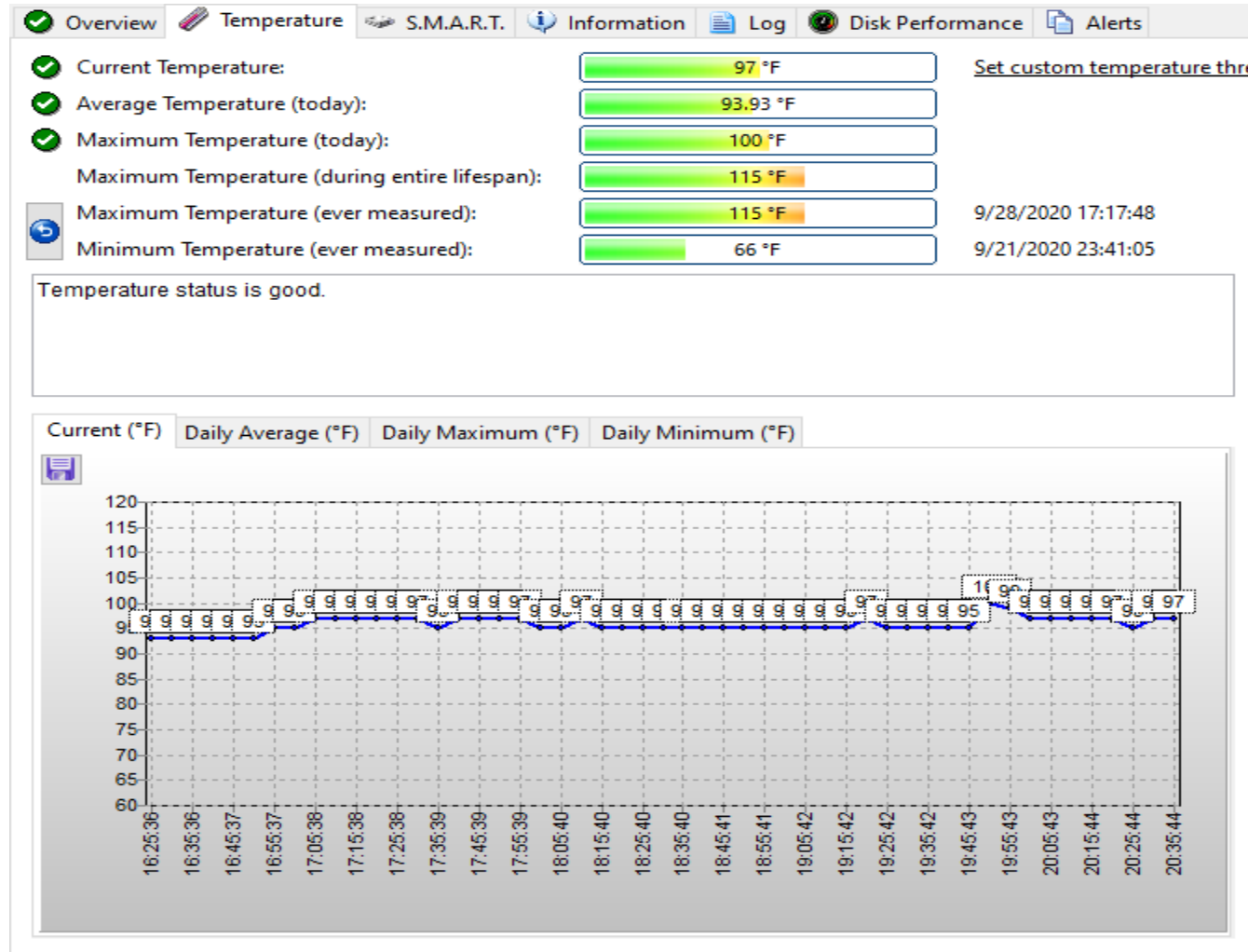•Clear data stored on drive

# Crucial Storage Executive

# HDS Main Display -- HDD

# HDS Temperature Display

# HDS SMART Display
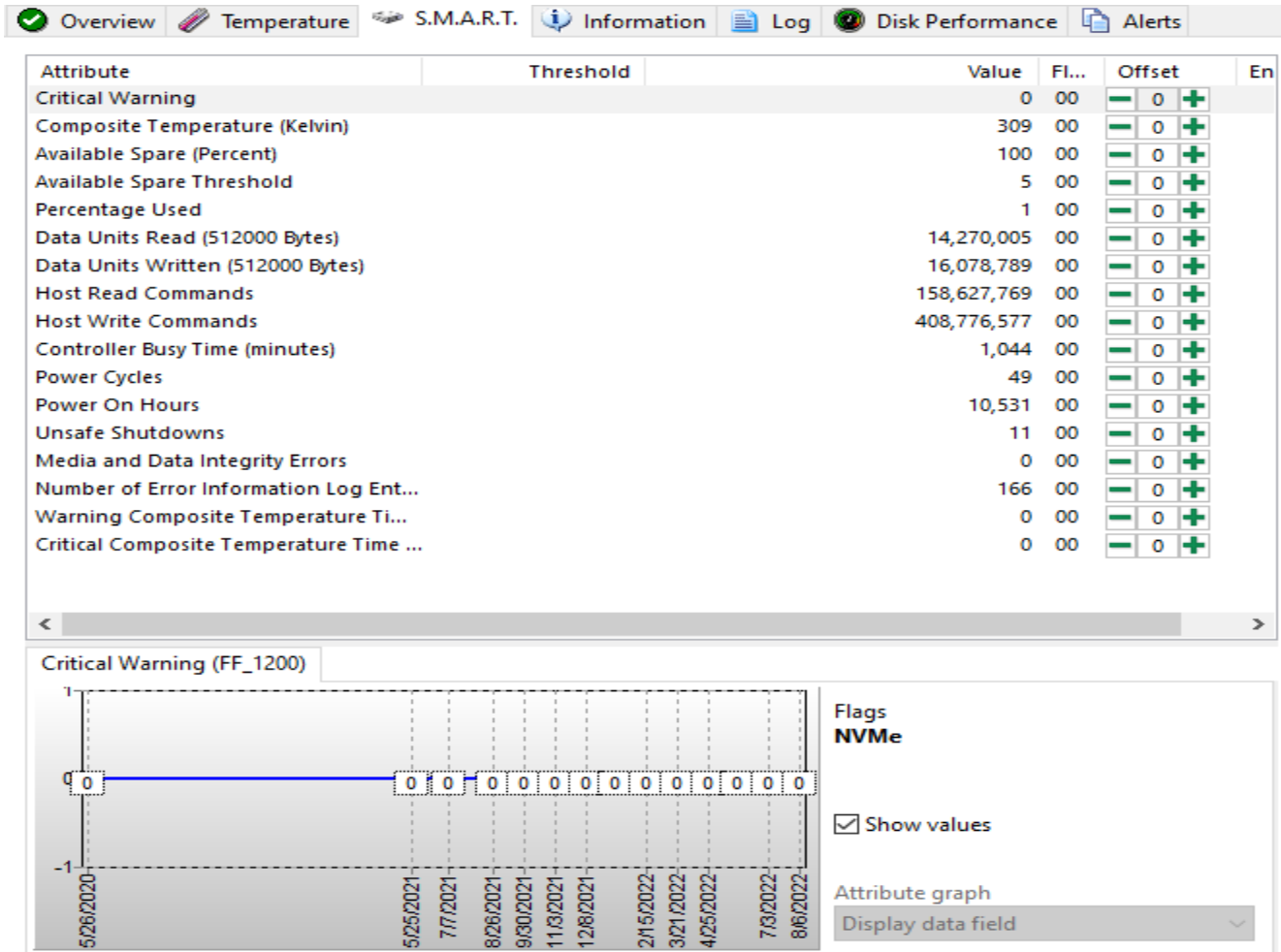
# HDS Information Display



| Hard Disk Summary | |
|---|---|
| Hard Disk Number | 0 |
| Interface | NVMe |
| Disk Controller | Standard NVM Express Controller (PCI\CC_010802) [VEN: 1BB1, DE... |
| Disk Location | Bus Number 0, Target Id 0, LUN 0 |
| Hard Disk Model ID | Seagate BarraCuda 510 SSD |
| Firmware Revision | STPSC014 |
| Hard Disk Serial Number | 7QL0058Z |
| Total Size | 953867 MB |
| Power State: | Active |

**Logical Drive(s)**

| Logical Drive | C: [] |
|---|---|

**Properties**

| NVMe Standard Version | 1.3 |
|---|---|
| PCI Vendor ID (VID) | 0x1BB1 |
| PCI Subsystem Vendor ID (SSVID) | 0x1BB1 |
| IEEE OUI Identifier | CF-24-00 |
| Recommended Arbitration Burst (RAB) | 1 |
| Multi-Interface Capabilities | 0 |
| Maximum Data Transfer Size | 512 (9) |
| Abort Command Limit | 4 |
| Asynchronous Event Request Limit | 4 |
| Number FW Slots Support | 7 |
| Maximum Error Log Page Entries | 63 |
| Total Number Of Power States | 5 |
| Admin Vendor Specific CMD Format | 1 |
| Submission Queue Entry Size | Max: 64, Min: 64 |
| Completion Queue Entry Size | Max: 16, Min: 16 |

# Why HDS?

- Drives include S.M.A.R.T. monitor
  - Detect/report drive reliability indicators
  - Anticipate drive failures
  - But most operating systems don't support
  - Warnings about failing drives: Norton, HDS
  - HDS maintained by dedicated developer
    - Passionate about product, brilliant support
    - Bargain price for multiple systems, lifetime support
    - Pro version includes portable tool
    - Smaller Linux version

# https://www.hdsentinel.com

Hard Disk Sentinel (HDSentinel) is a multi-OS SSD and HDD monitoring and analysis software. Its goal is to find, test, diagnose and repair hard disk drive problems, report and display SSD and HDD health, performance degradations and failures. Hard Disk Sentinel gives complete textual description, tips and displays/reports the most comprehensive information about the hard disks and solid state disks inside the computer and in external enclosures (USB hard disks / e-SATA hard disks). Many different alerts and report options are available to ensure maximum safety of your valuable data.

No need to use separate tools to verify internal hard disks, external hard disks, SSDs, hybrid disk drives (SSHD), disks in RAID arrays and Network Attached Storage (NAS) drives as these are all included in a single software. In addition Hard Disk Sentinel Pro detects and displays status and S.M.A.R.T. information about LTO tape drives and appropriate industrial (micro) SD cards and eMMC devices too. See the How to: monitor Network Attached Storage (NAS) status for information about hard disk monitoring in Network Attached Storage (NAS) devices.

# https://www.hdsentinel.com/

Hard Disk Sentinel monitors hard disk drive / HDD status including health, temperature and all S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) values for all hard disks. Also it measures the disk transfer speed in real time which can be used as a benchmark or to detect possible hard disk failures, performance degradations.

HDSentinel is the perfect data protection solution: it can be effectively used to prevent HDD failure and SSD / HDD data loss because it has the most sensitive disk health rating system which is extremely sensitive to disk problems. This way even a small HDD problem can't be missed. The Professional version has scheduled and automatic (on-problem) disk backup options to prevent data loss caused by not only failure but by malware or accidental delete also.

# https://www.hdsentinel.com/

## Store of Hard Disk Sentinel Software

Current special offer: use Hard Disk Sentinel Professional to protect the computers of the family.

Buy a **Family license** now:
Protect up to 5 computers by Hard Disk Sentinel Professional
Now just EUR 49.95 / USD 53.00 (lifetime license)

## Product Comparison

Hard Disk Sentinel application is shareware. Download Hard Disk Sentinel Trial version to examine the application and test its functionality and verify hardware compatibility. If you like this software, register it after evaluation to get highest level of data protection, use all features and to get full support. The differences between the trial, the Standard and the Professional versions:

| Feature | Trial | Standard | Professional | Enterprise |
|---|---|---|---|---|
| Display hard disk / SSD health and free space details | ✔ | ✔ | ✔ | ✔ |
| Support IDE/SATA/SCSI/SAS/USB/NVMe drives | ✔ | ✔ | ✔ | ✔ |
| Detect self-monitoring attributes, changes/degradations | ✔ | ✔ | ✔ | ✔ |
| Extended S.M.A.R.T. information | ✔ | ✔ | ✔ | ✔ |
| Display status on tray, disk icons, desktop/sidebar | ✔ | ✔ | ✔ | ✔ |
| Run as Application or Service (for non-admin users) | ✔ | ✔ | ✔ | ✔ |
| Hardware short/extended disk tests | ✘ | ✔ | ✔ | ✔ |
| Hard disk seek time, stress tests | ✘ | ✔ | ✔ | ✔ |
| Disk reports in text/HTML format | ✘ | ✔ | ✔ | ✔ |
| Information by web browser (WebStatus) | ✘ | ✔ | ✔ | ✔ |
| Customizable interface and reports | ✘ | ✔ | ✔ | ✔ |
| Backup and restore configuration, statistics | ✘ | ✔ | ✔ | ✔ |
| Password protection | ✘ | ✔ | ✔ | ✔ |
| Wide range of alerts (e-mail, sound, message, etc.) | ✘ | ✔ | ✔ | ✔ |
| Daily status reports | ✘ | ✔ | ✔ | ✔ |
| Clock synchronization with atomic clock | ✘ | ✔ | ✔ | ✔ |

# Gibson Research "In Control"

Manage Windows 10 and 11 out-of-control updating and upgrading