#### MONITOR AND PROTECT YOUR PRECIOUS DATA WITH HARD DRIVE SENTINEL Review by Gabe Goldberg, APCUG Representative, Potomac Area Technology and Computer Society; APCUG Advisor, Region 2 ggoldberg (at) apcug.org

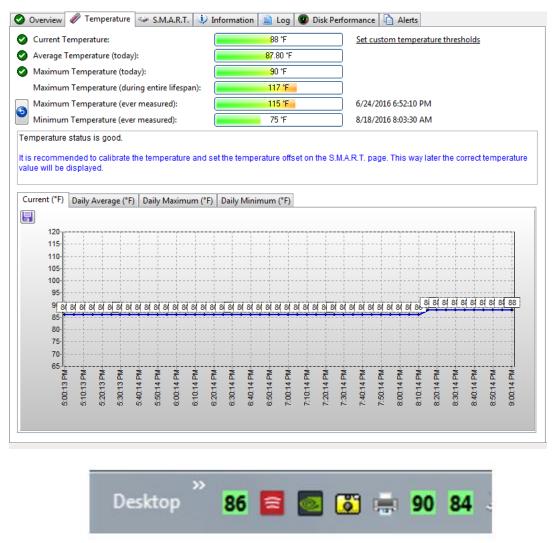
Storage devices are unappreciated workhorses: spinning hard drives and immobile memory chips reliably and rapidly save and fetch your data, year after year. Until -- uh oh, something's wrong and where's my data?!

I've been running HD Sentinel (HDS -- <u>http://www.harddisksentinel.com/</u>) for about five months on two computers -- my desktop system and my wife's laptop. It's a powerful tool for monitoring storage device health, and for learning more about how they work than you likely imagined possible. While the tool's website focuses on simple hard drives, HD Sentinel also supports other storage devices: SSDs, SSHD (hybrid drives), memory cards and thumb drives (where available), tape drives, and RAID controllers. On both my systems, I've configured it to show icons for each connected hard drive: one on the laptop and three (one internal, two external) on my system. By default, the icon shows current disk temperature (with green/orange/red visually indicating status); mousing over icons displays a summary of disk health and clicking opens the comprehensive display.

#### **Overview Display**

🐼 Disk: 2, WDC W	05000BEVT-00	ZATO [WD-WXN908NV6603] - Hard	d Disk Sentir	nel 4.71 F	RO												
Eile Disk View	<u>R</u> eport <u>C</u> o	onfiguration <u>H</u> elp															
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WDC WD5000	AAKX-60U6A/	A0 (465.8 GB) Disk: 0	🕗 Oven	view 🧳	Temperat	ture 💚	S.M.A.R.T.	🔱 Inform	nation 📗	Log 🤇	🗿 Disk Pe	erformar	nce 🕒 .	Alerts			
🕗 Health: 🔜	100 %	C: [System], E: [Data 1],	🕗 Perf	ormance	e (		100 %		Excell	ent							(?)
Temp.:	84 °F	F: [Data 2], [System Reserved]	🖉 Hea	h.L			100 %		Excell								0
WDC WD20NM	IVW-11EDZS3	3 (1863.0 GB)	Hea	lith:	U		100 %		Excell	ent							0
📀 Health: 🔜	100 %	Disk: 1	The har	d disk st	tatus is PER	RFECT. Pr	oblematic	or weak se	ctors were	e not foun	d and the	re are n	o spin up	or data tr	ansfer e	rrors.	(?)
Temp.:	88 °F	G: [My Passport]	No actio	ons need	ded.												
WDC WD5000	BEVT-00ZATO	(465.8 GB)															
🕗 Health: 🔜		Disk: 2															
Temp.:	88 °F	I: [WDC 500GB]															
C: [System]	(195.2 GB)	)	1												_		
Free Space	135.1 GB	Disk: 0	Power or Estimate		ning lifetime		42 days, 14 re than 10									Repeat T	est 🕐
E: [Data 1]	(146.5 GB)	)	Total sta				739	1									
Free Space	136.3 GB	Disk: 0	Click to	add com	nment												
F: [Data 2]	(124.0 GB)	)	Health	(%)													
Free Space	123.9 GB	Disk: 0															
G: [My Passport]	(1863.0 GB)	)		r													
Free Space	1862.7 GB	Disk: 1															
I: [WDC 500GB]	(465.8 GB)	)															
Free Space	178.0 GB	Disk: 2		[100]	100	100 1	00 10	100	100	100	100	100	100	100	100	100	100
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Status last updated:	11/13/2016 Su	nday 8:20:14 PM															

### **Temperature Display**



HDS can be used for maintaining one's at-a-glance comfort level (I like all my drives described, "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.") and for drilling into drive history (temperature patterns, various sorts of errors, performance information, and more.

For many years, hard drives have included S.M.A.R.T. technology -https://en.wikipedia.org/wiki/S.M.A.R.T. -- described as "a monitoring system included in computer hard disk drives (HDDs) and solid-state drives that detects and reports on various indicators of drive reliability, with the intent of enabling the anticipation of hardware failures". But annoyingly, most operating systems don't easily make that information -- and recommendations or warnings -- available. At least twice, based on such warnings, I've been able to replace drives in the process of failing before any data was at risk. So, I'm a firm believer in having software running to disclose drive information while there's time to act on it.

## S.M.A.R.T Display

	Attribute	Threshold	Value	Worst	Status	Data	Offset	Enab	le
)1	Raw Read Error Rate	51	200	200	OK	00000000007	- 0 -	F 🗹	
3	Spin Up Time	21	200	154	OK	000000003BE	- 0 -	F 🗹	
4	Start/Stop Count	0	52	52	OK (Always	.00000000BE63	- 0 -	F 🗹	
5	Reallocated Sectors Co	140	200	200	OK	00000000000	- 0 -	F 🔽	
7	Seek Error Rate	0	100	253	OK (Always	.00000000000	- 0 -	F 🔽	
9	Power On Time Count	0	27	27	OK (Always	.00000000D23E	- 0 -	F 🗸	
10	Spin Retry Count	51	100	100	OK	00000000000	- 0 -	F 🗹	
11	Drive Calibration Retry	0	100	100	OK (Always	.00000000000	- 0 -	F 🔽	
12	Drive Power Cycle Count	0	100	100	OK (Always	.000000000E0	- 0 -	F 🔽	
192	Power off Retract Cycle	.0	169	169	OK (Always	.000000005D38	- 0 -	F 🔽	
193	Load/Unload Cycle Cou	.0	152	152	OK (Always	.0000000238E6	- 0 -	F 🗹	
194	Disk Temperature	0	116	100	OK (Always	.0000000001F	- 0 -	F 🗹	
196	Reallocation Event Coun	t0	200	200	OK (Always	.00000000000	- 0 -	F 🔽	
197	Current Pending Sector	.0	200	200	OK (Always	.00000000000	- 0 -	F 🗹	
198	Off-Line Uncorrectable	.0	100	253	OK (Always	.00000000000	- 0 -	F 🗹	
199	Ultra ATA CRC Error Co	0	200	200	OK (Always	.00000000000	- 0 -	F 🔽	
200	Write Error Rate	51	100	253	OK	00000000000	- 0 -	-	
8 6 4	Read Error Rate	1-1-1-1		4	- 5 - 5	7-7-7-7			erving, Error-Rate, ance, Statistical, Critical

# Information Display

Hard Disk Summary		
Hard Disk Number	2	
Interface	SAT Standard USB/ATA	
Vendor Information	VID: 1058, PID: 0705	
Disk Controller	Renesas Electronics USB 3.0 Host Controller (USB 3.0) [VEN: 1033, DEV: 0194] Versio	
Hard Disk Model ID	WDC WD5000BEVT-00ZAT0	
Firmware Revision	01.01A01	
Hard Disk Serial Number	WD-WXN908NV6603	
Total Size	476937 MB	
Power State:	Active	
© Logical Drive(s)		
Logical Drive	I: [WDC 500GB]	
Logical Drive	I. [WDC 5000B]	
ATA Information		
Hard Disk Cylinders	969021	
Hard Disk Heads	16	
Hard Disk Sectors	63	
ATA Revision	ATA8-ACS	
Transport Version	SATA Rev 2.6	
Total Sectors	976773168	
Bytes Per Sector	512	
Buffer Size	8192 KB	
Multiple Sectors	16	
Error Correction Bytes	50	
Unformatted Capacity	476940 MB	
Maximum PIO Mode	4	
Maximum Multiword DMA Mode	2	
Active Multiword DMA Mode	2	
Maximum UDMA Mode	300 MB/s (6)	

HDS is developed/maintained/supported by a dedicated developer who's passionate about his product and brilliant at both tech support and answering questions about product usage. It's available at a bargain price for lifetime license (no renewal or subscription costs, free version upgrades) and a worthwhile investment in both knowledge and comfort.