

List of Public SMART Attributes

To: T13 Technical Committee
From: Jim Hatfield
Seagate Technology
389 Disc Drive
Longmont, CO 80503
Phone: 720-684-2120
Fax: 720-684-2722
Email: James.C.Hatfield@seagate.com
Date: October 18, 2005

Revision History:

0: Initial revision, split from proposal e05148r0

1 Introduction

The purpose of this proposal is to document the list of existing public SMART attributes, and to place that list into ATA8-ACS as an informative annex.

1.1 Disclaimers

This is a list of SMART attributes and names obtained from a public opensource project, so as not to violate any non-disclosure agreements.

This list was originally obtained from
<http://smartlinux.sourceforge.net/smart/attributes.php>

If any information listed here is protected by any existing legal agreements, then how that information got into the public domain was caused neither by T13 nor myself nor Seagate Technology.

Some of the descriptions have been edited for grammar and spelling.

This list is not intended to be comprehensive, complete or authoritative. Some of the IDs listed have other names and uses that are vendor-specific.

Some of these have been obsolete for a long time and may not supported.

The descriptions are vague and subject to multiple interpretations.

Consider everything in this list to be vendor-specific: scale, measurement units, thresholds, when they get cleared, minimum and maximum values.

1.2 Partial list of public SMART attributes

Table 1 - Legacy Attribute IDs

Decimal	Hex	Name	Description
0	00h	Invalid	Invalid attribute identifier
1	01h	Raw read error rate	Frequency of errors while reading raw data from a disk
2	02h	Throughput performance	Average efficiency of a hard disk
3	03h	Spinup time	Time needed to spin up
4	04h	Start/Stop count	Number of spindle start/stop cycles
5	05h	Reallocated sector count	Quantity of remapped sectors
6	06h	Read channel margin	Reserve of channel while reading
7	07h	Seek error rate	Frequency of errors while positioning
8	08h	Seek timer performance	Average efficiency of operations while positioning
9	09h	Power-on hours count	Number of hours elapsed in the power-on state
10	0Ah	Spinup retry count	Number of retry attempts to spin up
11	0Bh	Calibration retry count	Number of attempts to calibrate the device
12	0Ch	Power cycle count	Number of power-on events
13	0Dh	Soft read error rate	Frequency of 'program' errors while reading from a disk
191	BFh	G-sense error rate	Frequency of mistakes as a result of impact loads
192	C0h	Power-off retract count	Number of power-off or emergency retract cycles
193	C1h	Load/Unload cycle count	Number of cycles into landing zone position
194	C2h	HDA temperature	Temperature of a hard disk assembly
195	C3h	Hardware ECC recovered	Number of ECC on-the-fly errors
196	C4h	Reallocation count	Number of remapping operations
197	C5h	Current pending sector count	Number of unstable sectors (waiting for remapping)
198	C6h	Offline scan uncorrectable count	Number of uncorrected errors
199	C7h	UDMA CRC error rate	Number of CRC errors during UDMA mode
200	C8h	Write error rate	Number of errors while writing to disk (or) multi-zone error rate (or) flying height
201	C9h	Soft read error rate	Number of off-track errors
202	CAh	Data Address Mark errors	Number of Data Address Mark (DAM) errors (or) vendor-specific
203	CBh	Run out cancel	Number of ECC errors
204	CCh	Soft ECC correction	Number of errors corrected by software ECC
205	CDh	Thermal asperity rate (TAR)	Number of thermal asperity errors
206	CEh	Flying height	Height of heads above the disk surface
207	CFh	Spin high current	Amount of high current used to spin up the drive
208	D0h	Spin buzz	Number of buzz routines to spin up the drive
209	D1h	Offline seek performance	Drive's seek performance during offline operations
220	DCh	Disk shift	Shift of disk is possible as a result of strong shock loading in the store, as a result of falling (or) temperature

Decimal	Hex	Name	Description
221	DDh	G-sense error rate	Number of errors as a result of impact loads as detected by a shock sensor
222	DEh	Loaded hours	Number of hours in general operational state
223	DFh	Load/unload retry count	Loading on drive caused by numerous recurrences of operations, like reading, recording, positioning of heads, etc.
224	E0h	Load friction	Load on drive caused by friction in mechanical parts of the store
225	E1h	Load/Unload cycle count	Total number of load cycles
226	E2h	Load-in time	General time for loading in a drive
227	E3h	Torque amplification count	Quantity efforts of the rotating moment of a drive
228	E4h	Power-off retract count	Number of power-off retract events.
230	E6h	GMR head amplitude	Amplitude of heads trembling (GMR-head) in running mode
231	E7h	Temperature	Temperature of a drive
240	F0h	Head flying hours	Time while head is positioning
250	FAh	Read error retry rate	Number of errors while reading from a disk