HDDScan for Windows
Ver. 4.0

Introduction

HDDScan is a free utility to test HDD, RAID, Flash and SSD drives
The program can scan drive for Bad-blocks, display S.M.A.R.T. attributes and change some HDD parameters such as AAM, APM, etc.

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Support site: http://hddscan.com/

Capabilities and requirements:

Supported storage devises:

- ATA/SATA HDD
- SCSI HDD
- USB HDD (see Appendix A)
- FireWire or IEEE 1394 HDD (see Appendix A)
- RAID volumes made of ATA/SATA/SCSI HDDs (surface tests only)
- USB Flash (surface tests only)
- ATA/SATA SSD Drives

Storage device tests:

- Verification in linear mode
- Reading in linear mode
- Erasing in linear mode
- Reading in Butterfly mode (synthetic random read)

S.M.A.R.T.:

- Reading and analyzing S.M.A.R.T. parameters from ATA/SATA/USB/FireWire HDD
- Reading and analyzing Log Pages from SCSI HDD
- S.M.A.R.T. tests running on ATA/SATA/USB/FireWire HDD
- Temperature monitor on ATA/SATA/USB/FireWire/SCSI HDD

Additional features:

- Reading and analyzing identity information from ATA/SATA/USB/FireWire/SCSI HDD
- Changing AAM, APM, PM parameters on ATA/SATA/USB/FireWire HDD
- Reporting defect information on SCSI HDD
- Spindle start/stop function on ATA/SATA/USB/FireWire/SCSI HDD
- Reports can be saved in MHT format
- Reports can be printed
- Skins support
- Command line support
- SSD S.M.A.R.T. and Identity reports

Requirements:

- OS Windows XP SP3, Windows Vista, Windows 7-10 Windows Server 2008-2012.
- The program shouldn’t be started from a read-only device

User interface

Main view:

Pic.1 Main view

Control elements:

- Select Drive drop box - contains a list of supported storage devices in a system. The list contains models and serial numbers of the devices. Icon defines possible storage type.
- S.M.A.R.T. button – generates S.M.A.R.T. attributes report.
- TESTS button – shows pop-up menu to select read and write tests
- TOOLS button – shows pop-up menu to select available drive's controls and features
- More button – shows drop-down menu with program controls

- When you click on TEST button, the pop-up menu offers you one of the tests. If you select any test – the Test selection dialog will be opened.

Pic.2 Test selection pop-up

- When you click on TOOLS button, the pop-up menu would offer you to choose one of the following options.

Pic.3 Tools selection pop-up

- DRIVE ID – generates Identity information report.
- FEATURES – opens ATA or SCSI features control.
- S.M.A.R.T. TEST – activates a dialog with Short, Extended and Conveyance S.M.A.R.T. tests.
- TEMP MON – starts temperature monitoring task.
- COMMAND – opens a dialog that can build command line for the program.

Test Selection Dialog

Pic.4 Test Selection Dialog

Control elements:

- FIRST SECTOR – determines first Logical Block Address (LBA) for testing.
- SIZE – a number of LBAs for this test.
- BLOCK SIZE– indicates Block Size for testing (in LBA sectors).
- Previous button – returns the program on the Main screen.
- Next button – adds the test into a tasks' queue.

Tests capabilities and limitations:

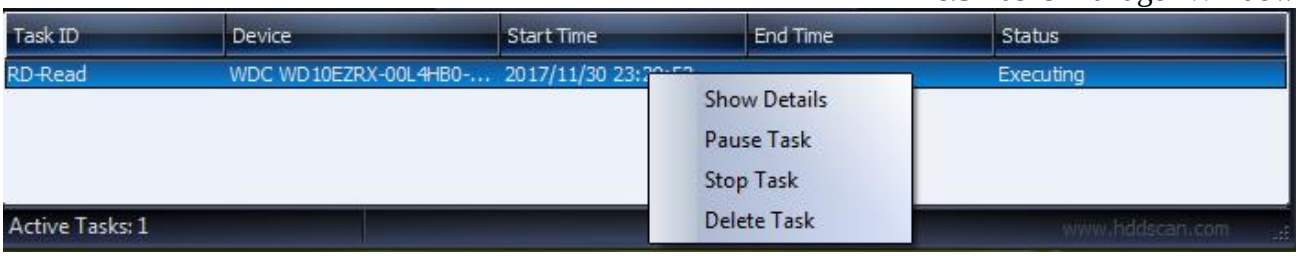
- Only one test at a time. Author wasn't able to get stable test results with two or more simultaneous tests.
- Verify test may have restrictions on Block Size with 256, 16384 or 65536 sectors because of Windows limitations.
- Verify test may work in unreliable way on USB/Flash devices.
- In Verify mode device reads block of data into drive's internal buffer only and checks for consistency, there is no data transfer through an interface connector/cable. The program measures operation time for each block. The program tests blocks one by one from minimum to maximum.
- In Read mode device reads block of data and transfers it thorough interface to the host controller. The program reads block of data into a temporary buffer and measures time of operation for each block. The program tests blocks one by one from minimum to maximum.
- In Erase mode the program prepares block of data field with special pattern and an LBA number. The program sends the block of data to the drive and the drive writes the block (**All previous data in the block on the drive will be overwritten with the pattern and cannot**

be recovered after that!) The program measures operation time for each block. The program tests blocks one by one from minimum to maximum.

- Butterfly Read mode is similar to Read mode difference only in blocks' order. Blocks are tested by pairs. The first block in the first pair will be Block 0, the second block in the first pair will be Block N (where N is number of last block for testing). Next pair will be Block 1 and Block N-1. Test ends in the middle of the testing area. The program measures operation time.

Tasks Manager Window

Pic.5 Tasks Manager Window



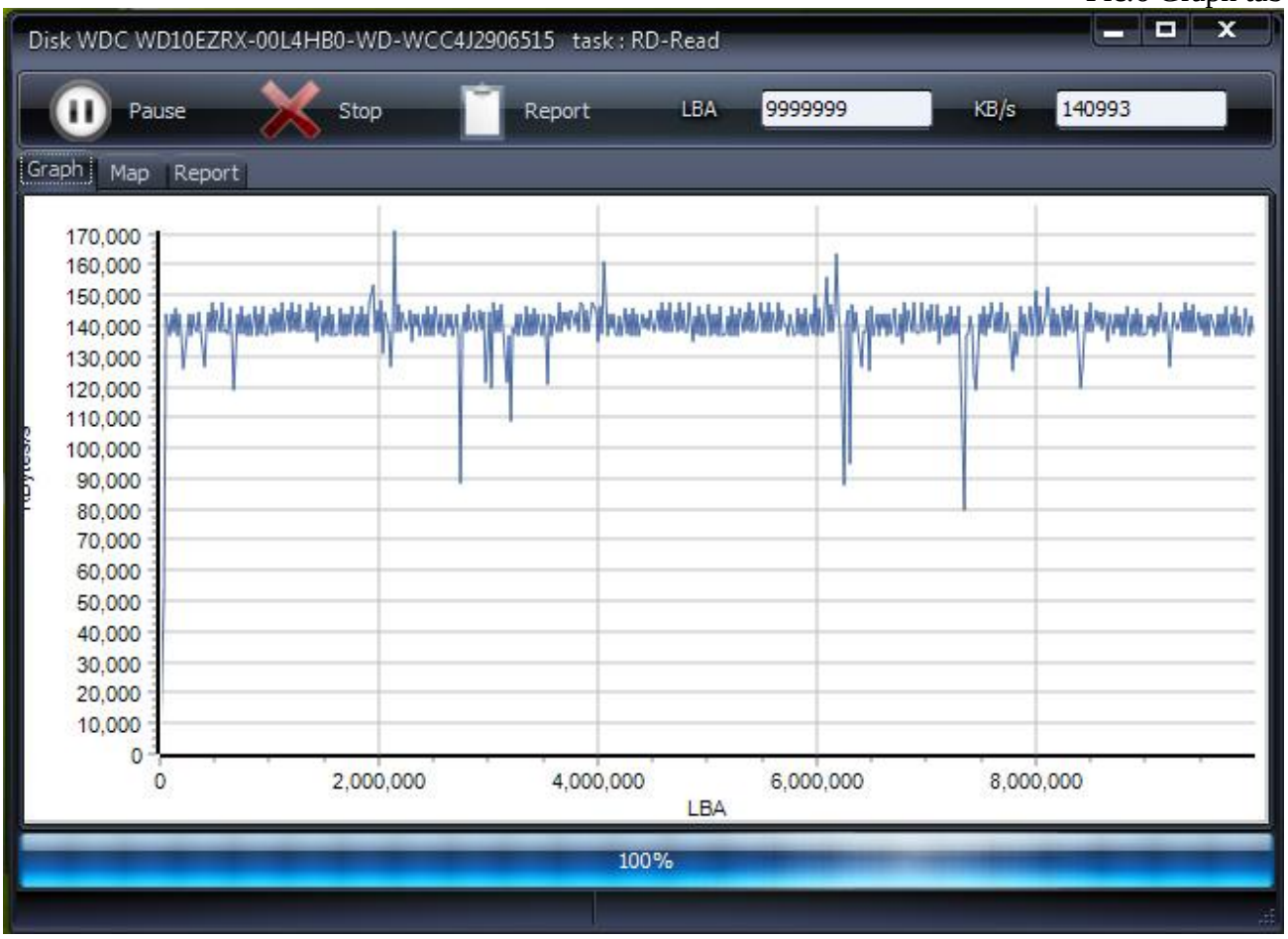
This window shows a tasks queue. All surface tests, S.M.A.R.T. tests and Temperature Monitor tasks will be displayed in the Tasks Manager Window.
Double clicking on a task line will open task information window (alternatively you can select Show Details option from the menu of the Tasks Manager).

Task information window

This window contains information about selected test. Test could be paused or stopped and report with results can be generated.

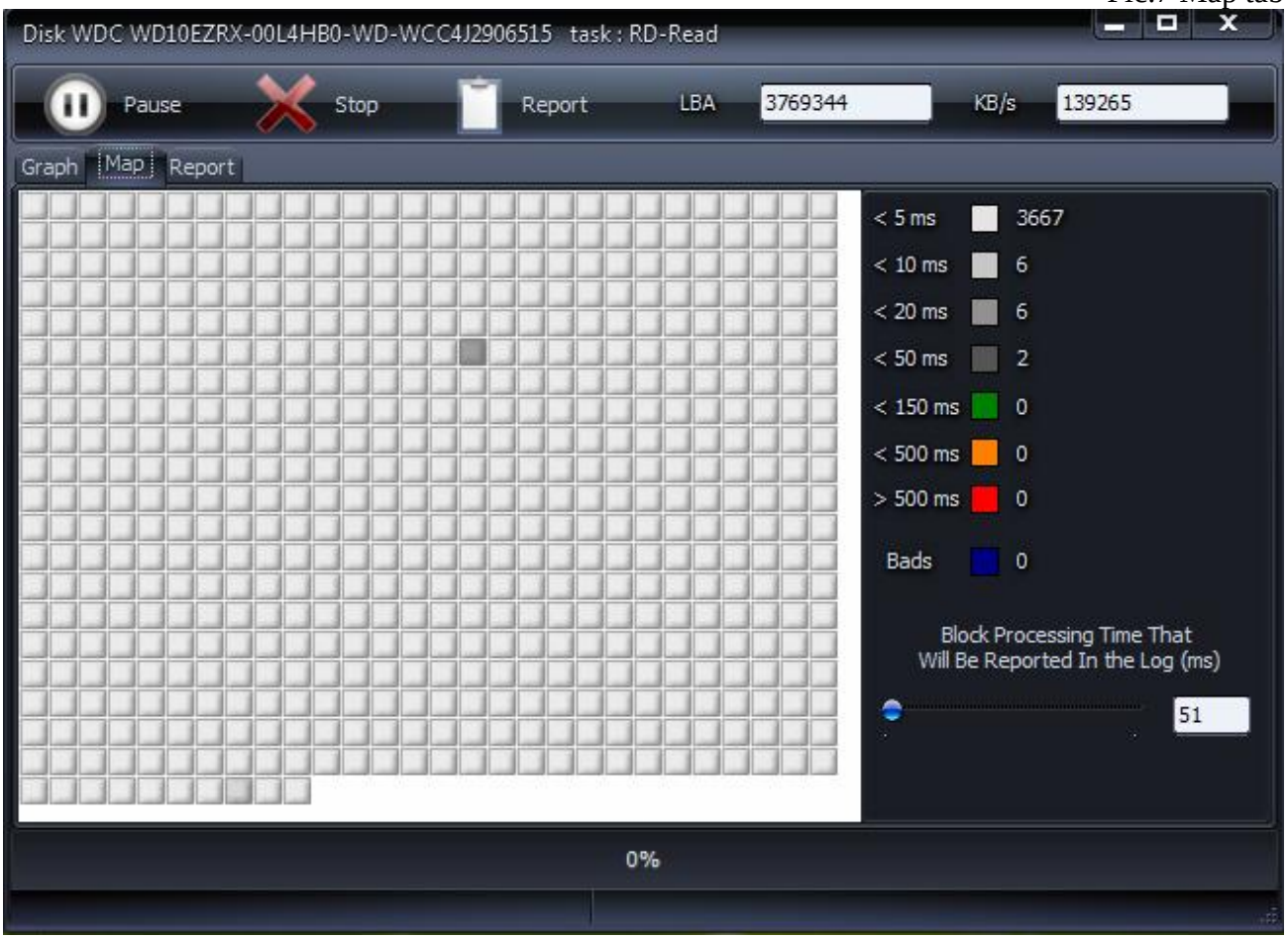
Graph Tab:
Displays testing speed for each block. Information is represented as a graph.

Pic.6 Graph tab



Map Tab:
Displays response time for each block. Information is represented as a map.

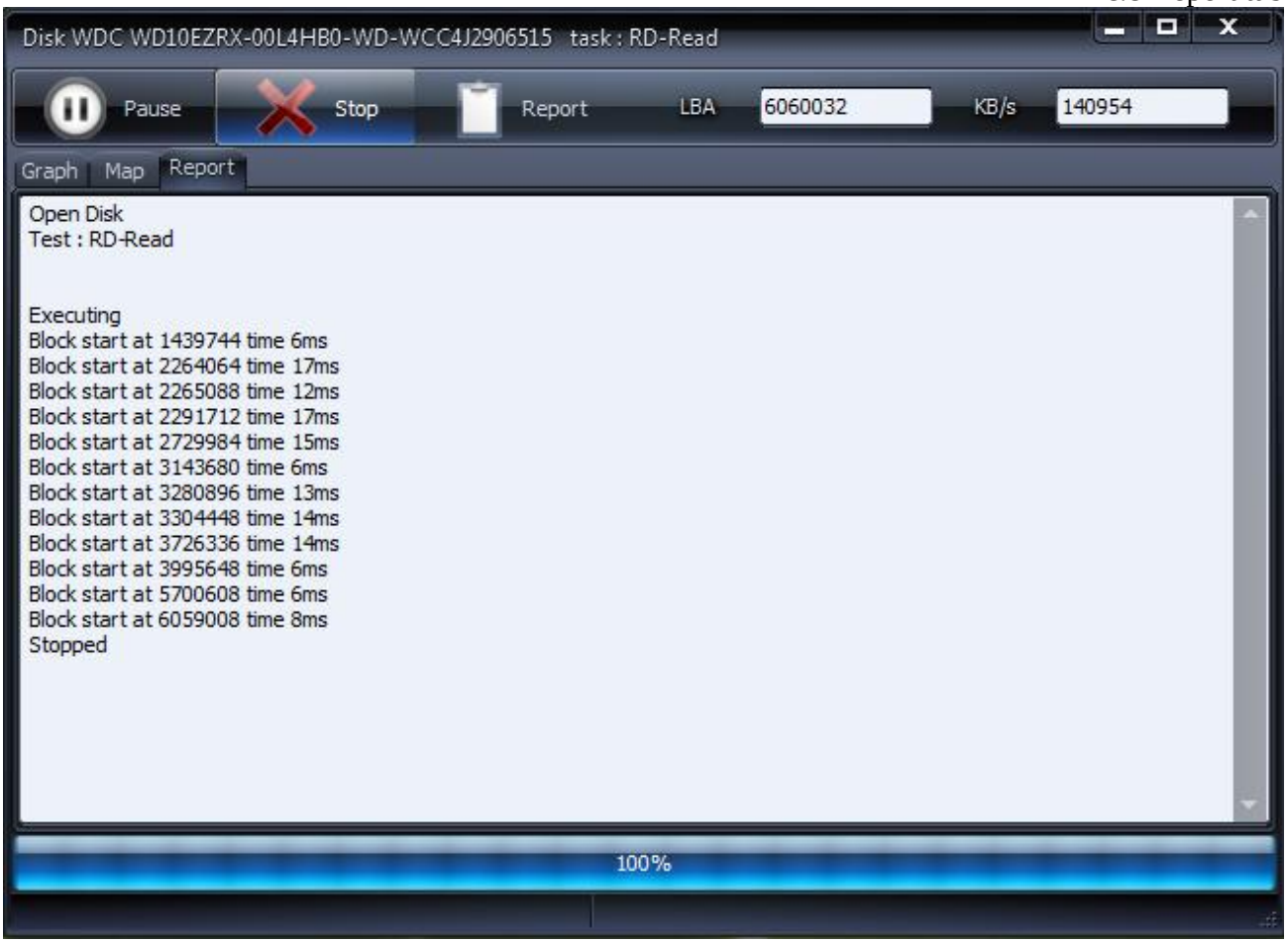
Pic.7 Map tab



You can select “Block Processing Time” in milliseconds. Every tested block that would have taken operation time longer than the “Block Processing Time” would be logged in the Report tab.

Report Tab:
Contains information about selected test and each tested block on a drive which responding time was longer than the “Block Processing Time”.

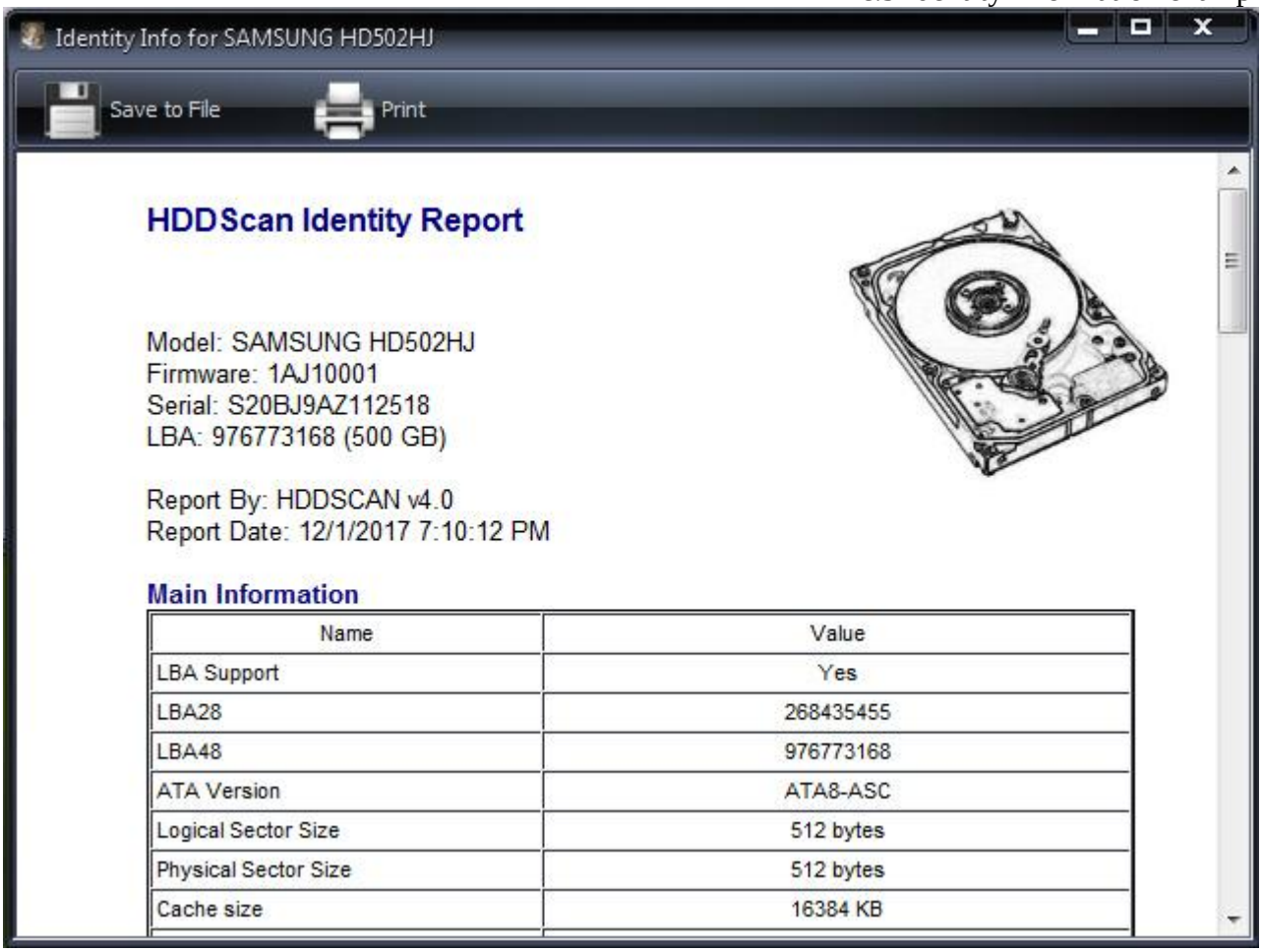
Pic.8 Report tab



Identity information

Report contains information about physical and logical parameters of HDD. Report can be saved to an MHT file.

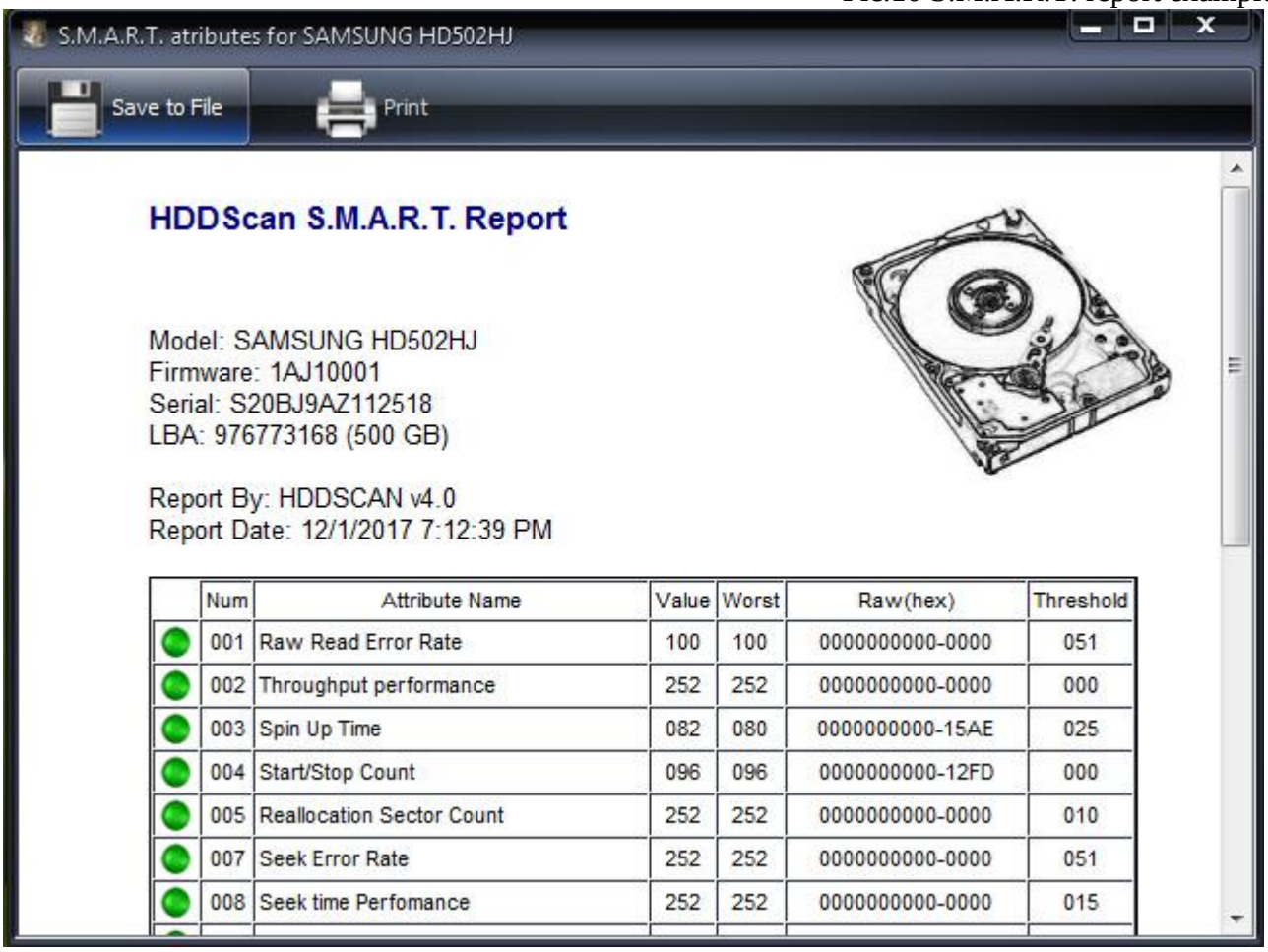
Pic.9 Identity information example



S.M.A.R.T. report

Report contains information about drive's performance and "health" described in attributes. Green icon means – attribute values are normal. Yellow icon marks important attributes which may indicate HDD's malfunction. Red icon indicates abnormal attribute values.
The report can be saved to an MHT file.

Pic.10 S.M.A.R.T. report example



	Num	Attribute Name	Value	Worst	Raw(hex)	Threshold
●	001	Raw Read Error Rate	100	100	0000000000-0000	051
●	002	Throughput performance	252	252	0000000000-0000	000
●	003	Spin Up Time	082	080	0000000000-15AE	025
●	004	Start/Stop Count	096	096	0000000000-12FD	000
●	005	Reallocation Sector Count	252	252	0000000000-0000	010
●	007	Seek Error Rate	252	252	0000000000-0000	051
●	008	Seek time Perfomance	252	252	0000000000-0000	015

Temperature monitor

Monitor allows evaluating HDD's temperature. Temperature is shown on the Task bar and in the information window. Pic.11 shows temperature for two drives.

Pic.11 Temperature monitors on the Task bar

For ATA/SATA/USB/FireWire drives the information widow displays two values. The second value is shown on the Task bar and represents temperature from HDA Temperature attribute. The first value indicates temperature from Airflow Temperature attribute. If the second value is not supported be the drive then the fist value will be shown on the Task bar.

Pic.12 Temperature monitor for ATA/SATA HDD

For SCSI drives the information window shows two values. The second value is shown on the Task bar and represents current temperature.
The first value indicates maximum allowed temperature for HDD.

Pic.13 Temperature monitor for SCSI HDD

S.M.A.R.T. tests

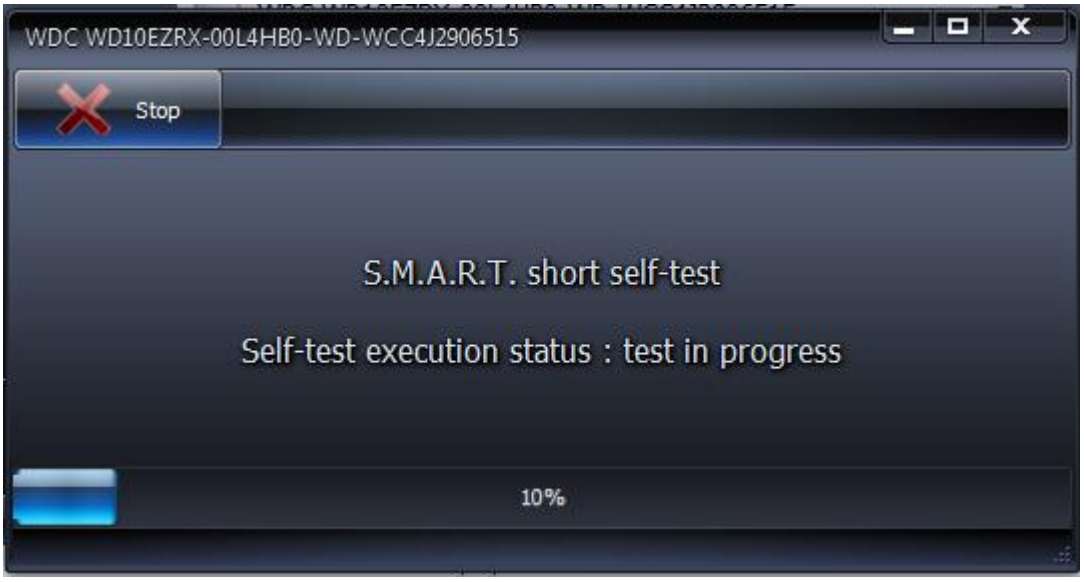
The program can run three types of tests
1. Short test – lasts about 1-2 minutes. The test inspects drive's main electronics, scans small part of drive's surface and checks sectors from the Pending-list (such sectors may have read errors). This test recommended for a quick drive testing.
2. Extended test – could take 0.5-60 hours, depending of the size of the drive. The test inspects drive's main electronics and scans the whole drive's surface.
3. Conveyance test – usually lasts several minutes. The test inspects drive's main electronics and logs that may have records which could indicate incorrect transportation or storing.

The SMART Test can be selected from the SMART tests dialog that can be called by pressing SMART TESTS button

Pic.14 S.M.A.R.T. Tests Dialog

After selecting, the test will be added to the Tasks queue.
SMART Tests details window can show progress and completion status.

Pic.15 S.M.A.R.T. test details window



Features Dialog

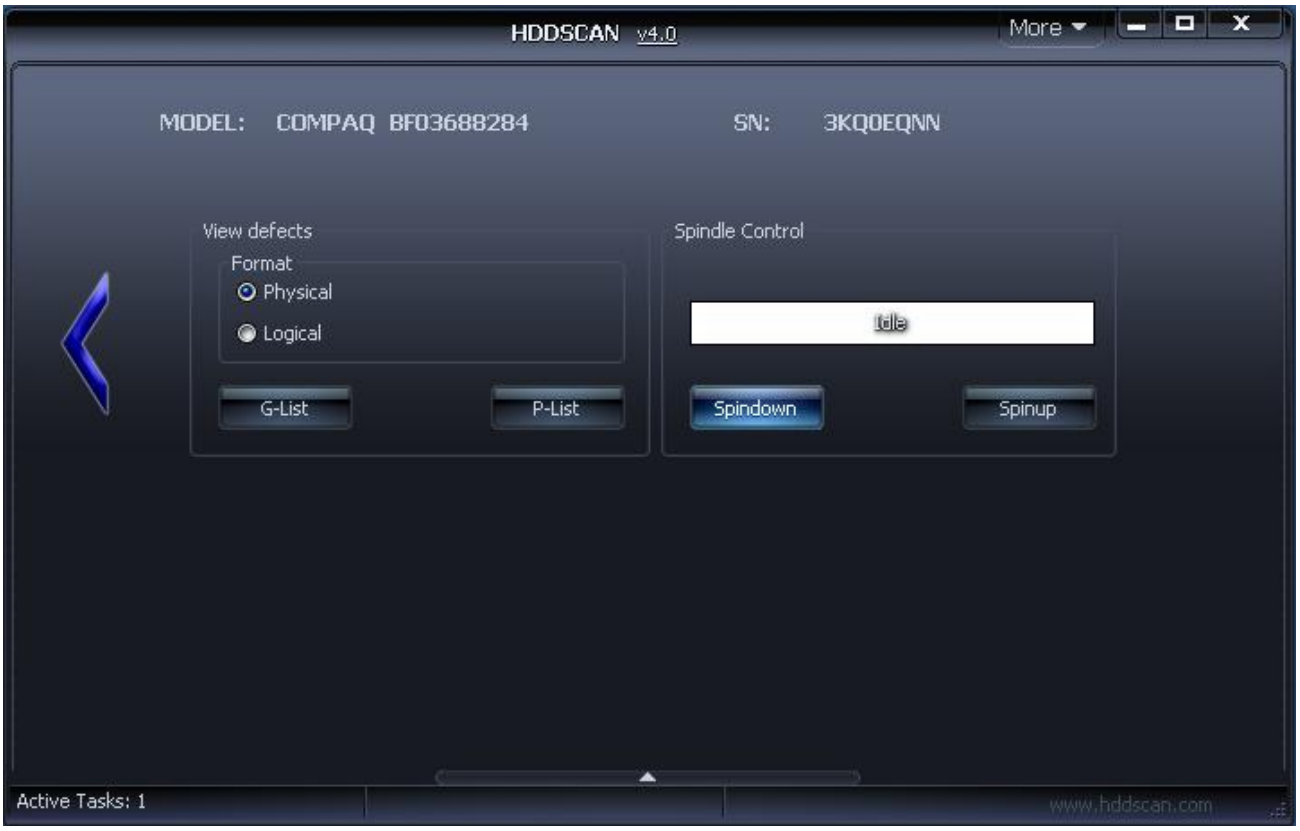
The program might be able change some parameters for ATA/SATA/USB/FireWire HDD.

1. AAM – this function changes drive's acoustic. If this function enabled drive's noise may be decreased by smoothing HSA's seek operations. HDD could lose some performance.
2. APM – this function allows power savings by temporary decreasing spindle's rotation speed (including complete stop) when drive is in idle.
3. PM – this function allows setting spin-down timer. If drive is in idle spindle would be stopped after the time set in the timer. If any program requests HDD access the internal timer will be reset and spindle will continue to spin.
4. The program can also start or stop spindle immediately. If any program requests HDD access - drive will spin up.

Pic.16 Features window for ATA/SATA HDD

For SCSI/SAS/FC drives the program can show defect-lists and start or stop the spindle.

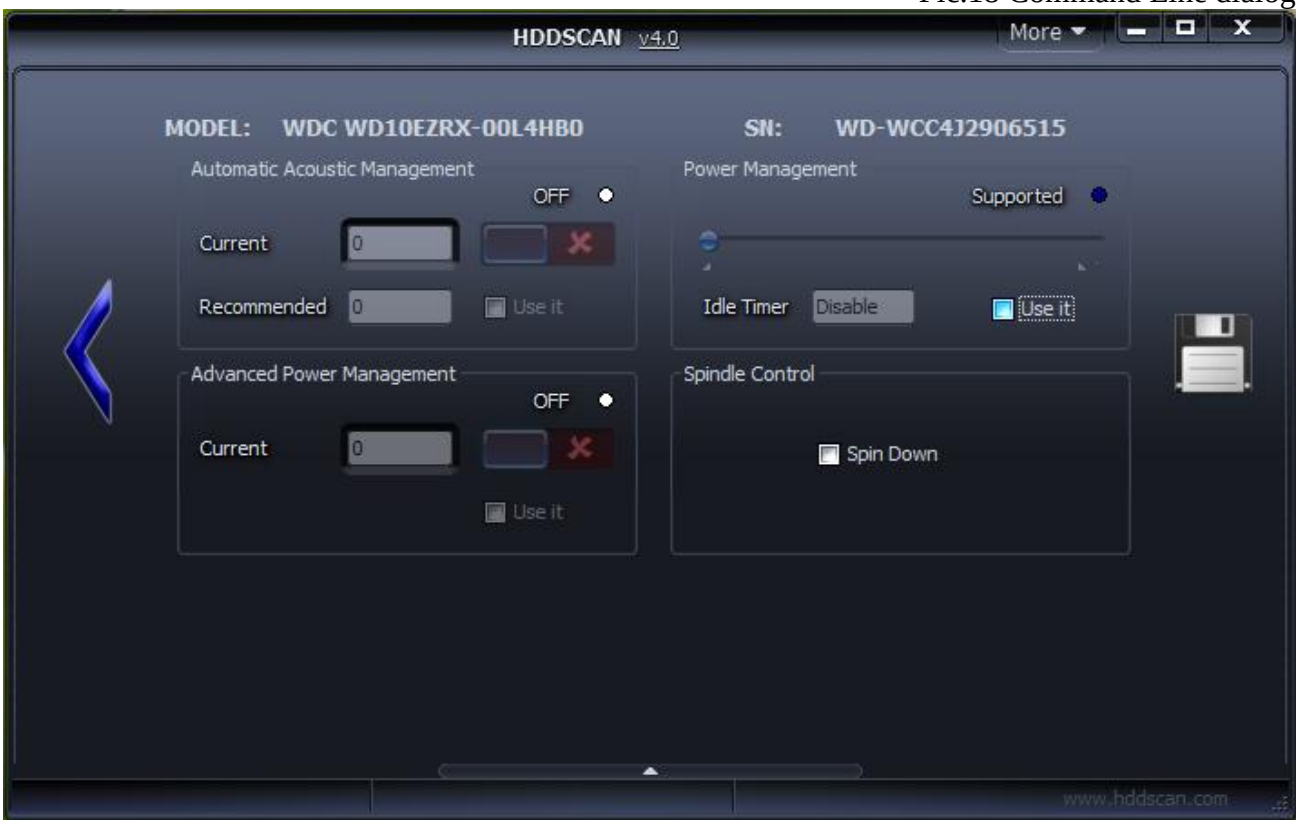
Pic.17 Features window for SCSI HDD



Command Line Dialog

HDDScan can build a command line and save it to .cmd or .bat file. When you run such file the program starts in background mode, changes selected parameters and closes automatically.

Pic.18 Command Line dialog



Appendix A: USB/FireWire HDD

If USB/FireWire HDD is supported by the program, tests, S.M.A.R.T. capabilities and additional features may be executed on the drive.
If USB/FireWire HDD is no supported by the program, only tests can be executed.

USB/FireWire HDDs supported by the program:

Storage device	Controller chip
StarTeck IDECase35U2	Cypress CY7C68001
WD Passpopt	Initio INIC-1610L
Iomega PB-10391	Unknown
Seagate ST9000U2 (PN: 9W3638-556)	Cypress CY7C68300B
Seagate External Drive (PN: 9W286D)	Cypress CY7C68300B
Seagate FreeAgentPro	Oxford
CASE SWEXX ST010	Cypress AT2LP RC7
Vantec CB-ISATAU2 (adapter)	JMicron JM20337
Beyond Micro Mobile Disk 3.5" 120GB	Prolific PL3507 (supported only USB)
Maxtor Personal Storage 3100	Prolific PL2507
Maxtor Personal Storage (USB2120NEP001)	In-System ISD300A
	SunPlus SPIF215A
Toshiba USB Mini Hard Drive	Unknown
USB Teac HD-15 PUK-B-S	Unknown
Transcend StoreJet 35 Ultra (TS1TSJ35U-EU)	Unknown
AGEStar FUBCP	JMicron JM20337
USB Teac HD-15 PUK-B-S	Unknown
	Prolific 2571
All Drives That Support SAT Protocol	Majority of Modern USB controllers

USB/FireWire HDDs which probably supported by the program:

Storage device	Controller chip
AGEStar IUB3A	Cypress
AGEStar ICB3RA	Cypress
AGEStar IUB3A4	Cypress
AGEStar IUB5A	Cypress
AGEStar IUB5P	Cypress
AGEStar IUB5S	Cypress
AGEStar NUB3AR	Cypress
AGEStar IBP2A2	Cypress
AGEStar SCB3AH	JMicron JM2033x
AGEStar SCB3AHR	JMicron JM2033x
AGEStar CCB3A	JMicron JM2033x
AGEStar CCB3AT	JMicron JM2033x
AGEStar IUB2A3	JMicron JM2033x
AGEStar SCBP	JMicron JM2033x
Noontec SU25	Prolific PL2507
Transcend TS80GHDC2	Prolific PL3507
Transcend TS40GHDC2	Prolific PL3507

I-O Data HDP-U series	Unknown
I-O Data HDC-U series	Unknown
Enermax Vanguard EB206U-B	Unknown
Thermaltake Max4 A2295	Unknown
Spire GigaPod SP222	Unknown
Cooler Master - RX-3SB	Unknown
MegaDrive200	Unknown
RaidSonic Icy Box IB-250U	Unknown
Logitech USB	Unknown

USB/FireWire HDDs not supported by the program:

Storage device	Controller chip
Matrix	Genesis Logic GL811E
Pine	Genesis Logic GL811E
Iomega LDHD250-U	Cypress CY7C68300A
Iomega DHD160-U	Prolific PL-2507 (modified firmware)
Iomega	Prolific PL-3507 (modified firmware)
Maxtor Personal Storage 3200	Prolific PL-3507 (modified firmware)
Maxtor One-Touch	Cypress CY7C68013
Seagate Pocket HDD	Unknown
Seagate External Drive (PN-9W2063)	Cypress CY7C68013
SympleTech SympleDrive 9000-40479-002	CY7C68300A
	Myson Century CS8818
	Myson Century CS8813

Appendix B: SSD drives

SSD support mostly depends on SSD controllers

SSD drives supported by HDDScan :

SSD Drive	SSD Controller Chip
OCZ Vertex, Vertex Turbo, Agility, Solid 2	Indilinx IDX110M00
Super Talent STT_FTM28GX25H	Indilinx IDX110M00
Corsair Extreme Series	Indilinx IDX110M00
Kingston SSDNow M-Series	Intel PC29AS21AA0 G1
Intel X25-M G2	Intel PC29AS21BA0 G2
OCZ Throttle	JMicron JMF601
Corsair Performance Series	Samsung S3C29RBB01
Samsung SSDs	Samsung Controllers
Crucial and Micron SSDs	Some Marvell Controllers

SSD drives which probably supported by HDDScan:

Накопитель	Микросхема контроллера
OCZ Vertex2, Agility2	SandForce SF1200
OCZ Vertex LE, Vertex 2 Pro	SandForce SF1500
Corsair Force F100 Series	SandForce SF1200
Xceed Lite	Unknown
Phison-based SSDs	Phison Controllers