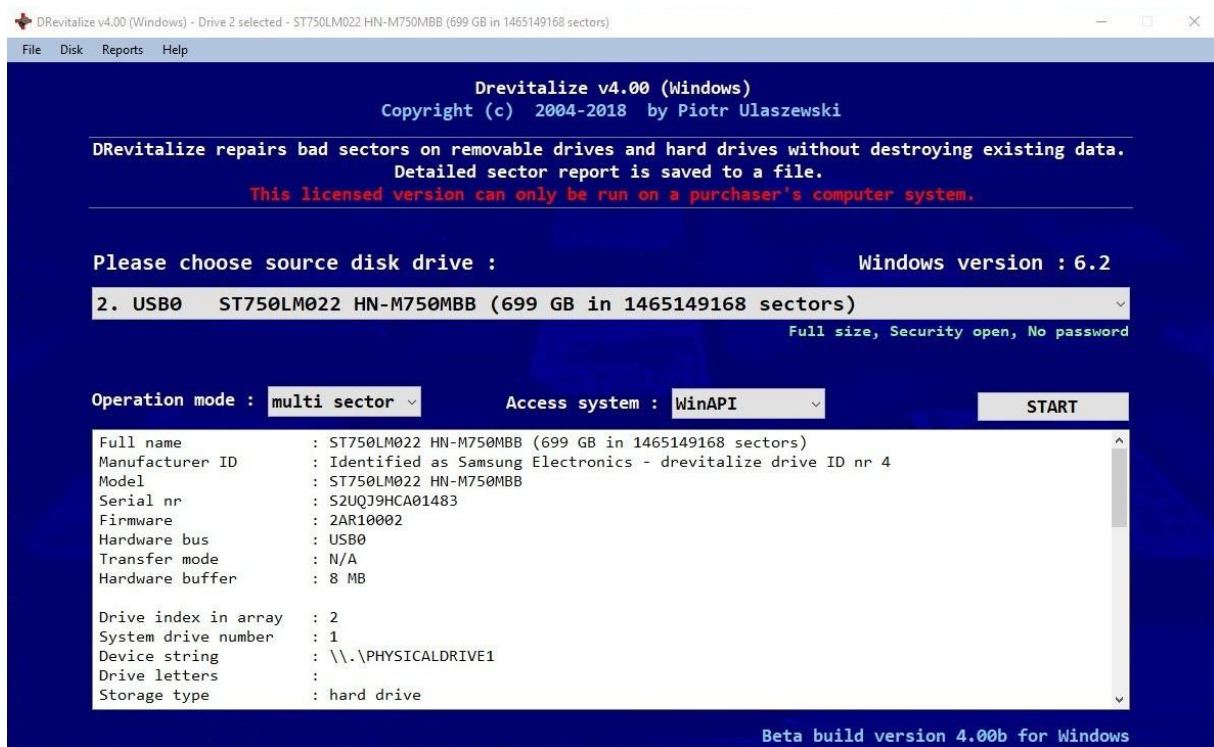


\*\*\*\*\*  
\* DRevitalize v4.10 (Windows)  
\* Copyright (c) 2004 - 2020 by Piotr Ulaszewski  
\* All rights reserved  
\*\*\*\*\*

Thank You very much for registering the DRevitalize software. Please save Your Paypal transaction details as it is a confirmation that You have legally obtained this software.



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The licensed version can only be run on a purchaser's computer system.

## SYSTEM REQUIREMENTS

DRevitalize 4.10 Windows requires windows vista or higher Windows operating system. Any operating system lower than Windows 10 must have Net Framework version 4.6 or higher installed. The program will not run on Windows XP.

DRevitalize 4.10 UEFI requires a PC with Pentium Core class CPU and an EFI BIOS able to run UEFI boot images.

## DREVITALIZE 4.10 CHANGES

- DRevitalize (UEFI) Possibility to choose AHCI controller if there are more than one.
- DRevitalize (UEFI) Vendor specific function "ATA clear password" support corrected for Samsung drives.
- DRevitalize (UEFI) Visual changes corrected. Now the system correctly displays when the drive is accessed via AHCI PIO.
- DRevitalize (Windows/UEFI) Feature and Firmware data now has the last operation status displayed on bottom of page.
- DRevitalize (Windows/UEFI) Display SMART data corrected for SSD drives with non standard SMART attributes table.
- DRevitalize (Windows) FAT32 format executed when creating boot version of DRevitalize (UEFI) supports pen drives up to 2TB (VALIDATE and INFOTOOL utilities).
- DRevitalize (Windows) No more ATA PIO transfer mode for single sector reads and writes on SATA channels. Every data transfer on SATA channels is now done via DMA.
- DRevitalize (Windows) Proper device reset has been implemented via windows IOCTL mechanism.

## DREVITALIZE 4.00 CHANGES

- New vendor specific manufacturer commands available in version 3.32+ and 4.00 : Toshiba SATA clear defect reassign and clear SMART, new HGST drives support for format unit and clear SMART.
- Supervisor mode allowing to execute any instruction on operating system hard drive C. Supervisor mode will require a special confirmation with a known password.
- Possibility to switch current manufacturer via menu. This way a different set of vendor specific ATA commands may be used for drives made by another manufacturer.
- All defined in ATA8 specification SMART tests, including the selective SMART test, are now available. Two status lines (one for offline scan and one for self scan) updated on a regular basis.
- All I/O operations are now made in synchronous mode. DRevitalize 4.00 will switch from asynchronous single threaded I/O used in 3.xx versions to synchronous multi threaded I/O.
- Major improvement and clarification of feature functions. Those will also include SATA specific feature functions.
- All possible Device Configuration Overlay settings may now be changed.
- ATA terminal with check & try possibilities for user defined ATA commands.
- Detailed scan Log available anytime and with the possibility to be accessed even during scan.
- Major visual changes. Screenshots + maybe video with the explanations of all new functions to be released soon.
- DRevitalize will prevent the PC from going to sleep when application is active (version 4.0 - beta2).
- Several spelling errors corrected in main options screen and SMART test menu (version 4.0 - beta2).
- Tab order corrected in most places (version 4.0 - beta2).
- Selected drive does not reset to first available after going back to main start screen (version 4.0 - beta3).
- Time, date, operation mode, access system and total scan time is now added to LogBox (version 4.0 - beta3).
- Log completed time added to LogBox. Total scan time calculation and display corrected (version 4.0 - beta4).
- Inserting or removing a USB device does not stop the scan anymore (version 4.0 - beta5).
- Slow areas exact access time is now displayed in log (version 4.0 - beta5).
- All known devices in the year 2019 are now detected and displayed with correct bus (version 4.0 - beta6).
- Registers display on scan screen corrected, no more SCSI status for WinAPI access (version 4.0 - beta6).
- Windows version is now displayed correctly up to Windows 10 (version 4.0 - beta6).
- UEFI boot mode EFI executable can now be created with VALIDATE tool (version 4.0 - beta7).
- Minor visual changes and updates added (version 4.0 - beta7).
- End screen and log corrected for "Copy drives" function (version 4.0 - beta7).
- Slow sectors are marked in orange instead of yellow in progress bar.
- Hardware 2D GUI acceleration added to UEFI version in most places.
- **Please turn off "Secure Boot" in the BIOS to run DRevitalize (UEFI).**

## INTRODUCTION

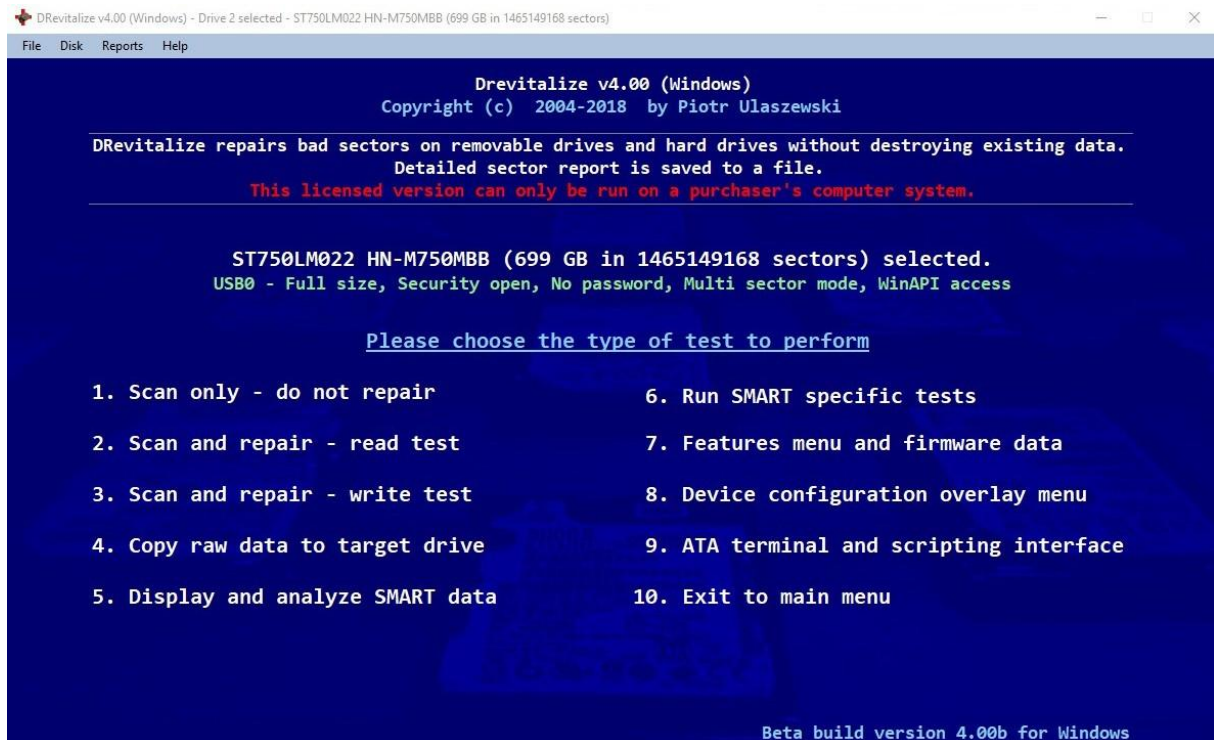
DRevitalize is a program that repairs bad sectors (physical defects) on popular magnetic media (hard drives and also floppy drives to some extent) by generating a special sequence of high and low level signals around the physically damaged area. The surface of almost any drive can be repaired with this utility (even hard drives that were dropped down or exposed to electromagnetic fields). However, in some cases DRevitalize software will simply force reallocation of bad sectors instead of repairing them. Whether sectors are restored or reallocated is totally dependent on the drive surface and current drive setup which usually forces intelligent defect management by default.

Drevitalize for Windows access drives via reading and writing disk sectors API, ATA DMA, ATA Read Verify, SCSI or SCSI Read Verify. It doesn't matter whether you have a FAT16, FAT32, NTFS or any other file system installed on your drive. It will recognize any hard drive that Windows recognizes. DRevitalize will only run if the user has administrator privileges.

First, the user has to select the appropriate **operation mode** (by default it is multi sector mode) and **access system** (by default it is WinAPI).

**Operation mode** can be switched to single sector. **Access system** can be switched to direct ATA/SCSI or ATA/SCSI Read Verify mode. ATA/SCSI RV is a very fast access system where no data is actually transferred from the drive. Drevitalize simply orders the tested drive to execute a read-verify command on the selected area of sectors. If the drive itself encounters an error in the selected area it returns an error to Drevitalize just as it would do in normal read mode.

When the drive to be tested is selected in the main combo box, pressing **Start** will proceed to next screen. This screen contains 10 main functions to choose from : Read test, Read & Repair test, Write & Repair test, Copy Raw data, Analyze SMART, SMART Specific tests, Features menu, DCO menu, ATA Terminal and Exit to start screen.



## SCAN ONLY/SCAN READ/SCAN WRITE TESTS

### 1. Scan only mode.

In this mode DRevitalize will only scan the drive for bad and slow sectors. It will not try to repair nor modify any data stored on the drive. Very useful when You have extremely valuable data on the drive and just need to test from time to time if everything with the drive is OK.

### 2. Scan and repair (read test).

In this mode Drevitalize will scan the drive using the standard read procedure (which was the only option in DRevitalize 2.30 and earlier). It will try to repair any bad sectors it encounters or refresh any slow sectors if the user specified such an action in options. The default refresh slow sectors value is 150ms for multi sector and 20ms for single sector scan mode but the user can alter this value. This is the delay above which a slow sector will be treated as a bad sector and revitalized. A typical drive access time to a single area should be less than 150ms, anything above that is suspicious and a warning that something wrong is starting to happen with the drive. Ultra fast SATA drives should have an access time below 100ms. **Please note that revitalizing slow sectors is a very dangerous operation and should be applied with caution and only if really necessary. Sudden power loss might result in severe data corruption on the revitalized drive.** Further function specific options include the number of passes and repair count loop. Number of passes value specifies the amount of times the selected area will be scanned. Repair count loop value specifies the amount times the internal drive repair procedure is executed on a bad or slow sector.

Before proceeding it is strongly recommended to stop all other applications accessing the drive that is about to be revitalized, especially when revitalizing slow sectors. The user should back up all his data for maximum security. Damaged sectors that the utility cannot read (it will try to read a damaged sector at least 3 times using different techniques) **WILL LOSE THEIR DATA**. This is a necessary step in order to revitalize a particular sector. But as far as I'm concerned this should not be a problem because sectors that are marked bad by the operating system do not contain data anyway. It would be best to run a standard recovery utility first, and then when all data is secured run the DRevitalize utility to reclaim all bad sectors. In some cases standard data recovery utilities might refuse to run due to bad sectors. If this happens there is no other way then trying to run Drevitalize first and software that restores logical partition info and directory data next. Please note that you will have to reformat your hard drive in order to erase bad sector flags triggered by the operating system.

Modern hard drives only show bad sectors on write access when their spare sector pool has been exhausted. This means that if automatic sector reallocation was turned on when the drive surface started getting bad, those bad sectors were replaced by good sectors from the spare sector pool causing sector reallocation (and as a result a slower access to those sectors). This utility will let the drive intelligent defect management system decide whether to reallocate or entirely reclaim a bad sector.

Since the release of version 2.00 of Drevitalize new MULTI sector system reads have been introduced. Those are indicated by the MULTI text in the mode specifier on the scan screen. For a normal and healthy hard drive on a modern system the MULTI text should always be displayed in green. A yellow MULTI mode scan may occur if Drevitalize finds out that it can't read from the Disk with a higher speed than 4MB/s. This is a warning of potential drive surface or interface problems. However please note that a slow PIO interface or a slow old hard drive might not reach the requested 4MB/s. Each yellow MULTI sector reads are indicated by a counter on the right side of the screen called SLOW. However this counter is only increased if the area access time is higher than 150ms. This counter should stay 0 for a modern healthy hard drive. When Drevitalize has serious problems to read a disk sector it will switch to red SINGLE mode and indicate this in the ERROR counter on the right side of the screen. It means a read error in MULTI sector mode occurred but it has not yet been diagnosed as bad sector by the program. In red SINGLE mode Drevitalize reads sector by sector analyzing the surface. Upon detecting the bad sector it will send out a series of signals to the drive surface trying to restore its condition. Recovery information on the fly is shown below the current mode indicator on the right side of the screen. Patt shows the current pattern applied to the drive surface during recovery of bad sectors. In addition, recent versions of Drevitalize show nanoseconds precision access time to each sector when operating in single sector mode. In some cases when the drive has several bad sectors in a row the only way to stop Drevitalize is by instantly closing the program window under Windows or pressing several times ESC key under DOS/UEFI.

```

Drevitalize v4.00 (Windows)
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Hardware interface : USB0 (HDD)           Access system : SCSI EX
Hardware buffer size : 8 MB                Software buffer : 128 KB
Bytes per sector : 512n                    Scanning mode : multiple
Firmware : 2AJ10001                       Slow Areas : 0
Serial number : S265J90Z728080            Bad Areas : 0

SAMSUNG HM321HI (298 GB in 625142448 sectors) selected.
USB0 - Full size, Security open, No password

SCAN AND REPAIR - READ TEST

Current sector : 428800 (209 MB)           Average speed : 89,9 MB/S
Sectors refreshed : 0                     Estimated time : 57:51 min
Bad sectors found : 0                     Current mode : MULTI
Bad sectors recovered : 0

SCSI SENSE L                               SCSI SENSE H
NS RE NR ME HE IR UA DP                   BC FE CA AC EQ V0 MC CD

FAST: 1ms SLOW: 23ms CURR: 1ms
M: MULTI R: 3 S: 150ms(N) P:1/1 - 0,07%

Hit (Esc) to stop [STOP]

Beta build version 4.00b for Windows

```

## OSD Information during scan :

**Hardware interface** - interface used by the program to access the drive. It can be ATAPI, ATA, 1394, SSA, FIBRE, USB, RAID, SCSI, SAS, SATA.

**Hardware buffer size** - Is the size of cache memory present on the hard drive. The higher it is the faster and better in performance the drive is.

**Bytes per sector** - native and emulated (e = emulated, n = native).

**Firmware, Serial number** - shows hard drive manufacturer data.

**Access System** - shows the system used to access the drive. It can either be WinAPI, ATA DMA/SCSI or ATA RV/SCSI RV in DRevitalize for Windows or AHCI DMA, AHCI RV, BIOS INT 13H, ATA PIO OR ATA RV in DRevitalize for DOS.

**Software Buffer** - is the software buffer size used by DRevitalize in MULTI sector mode reads or writes.

**Scanning mode** - is either multi sector or single sector.

**Slow Areas** - shows how many times the system entered YELLOW MULTI sector mode during scan. YELLOW MULTI sector mode is entered if the current block has an access time higher than 150ms by default. This can be altered with user defined number for access time when revitalizing slow sectors. When the user specifies 100ms for multi sector scan mode with revitalize slow sectors active, any area with access above 100ms will be counted as slow area.

**Bad Areas** - shows how many times the system entered RED SINGLE sector read mode during scan. This mode means that there was an error in multi sector scan and that the program needs to check each sector of that area separately.

## Bottom left corner options info :

Current access time statistics on the fly with FAST, SLOW and CUR access times in ms for the current block of sectors.

**M:** current mode, SINGLE or MULTI

**R:** current repair count 1 - 99

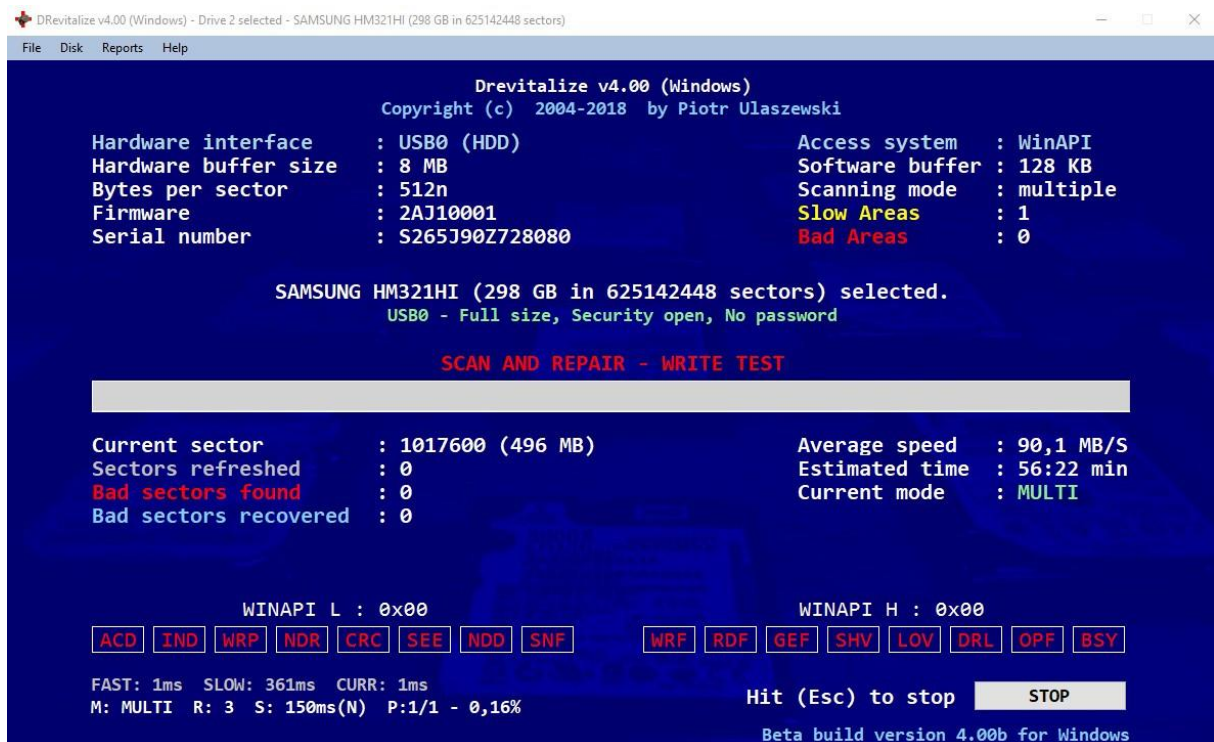
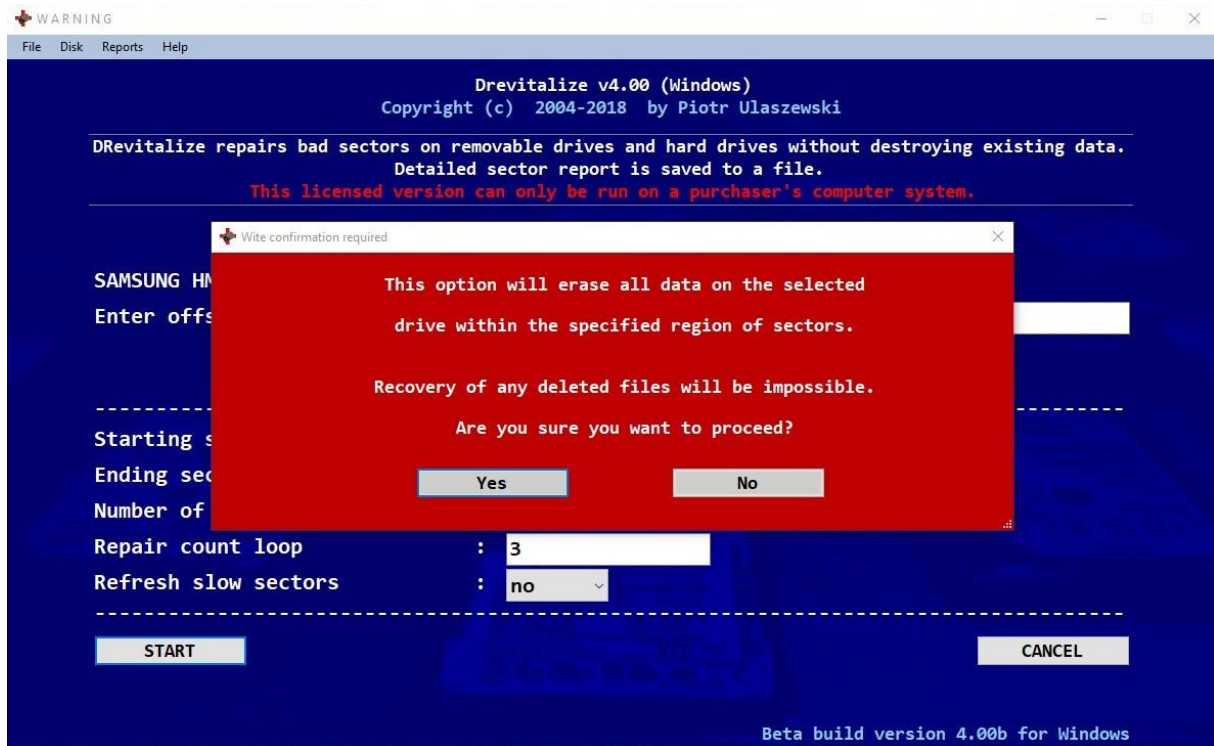
**S:** slow sectors refresh access time and in parenthesis whether it is activated or no

**P:** current pass / total passes

**%:** scan progress in %

### 3. Scan and repair (write test).

In this mode DRevitalize will scan the drive using the zero-fill write procedure. **This will erase all data on the drive.** Upon encountering a bad sector on write access DRevitalize will try to repair it using the modified repair algorithm which does not use any read operations. It is also possible to refresh slow sectors on write. This works the same way except that only the simplified revitalize procedure including write only commands is executed. **This test requires explicit confirmation.**



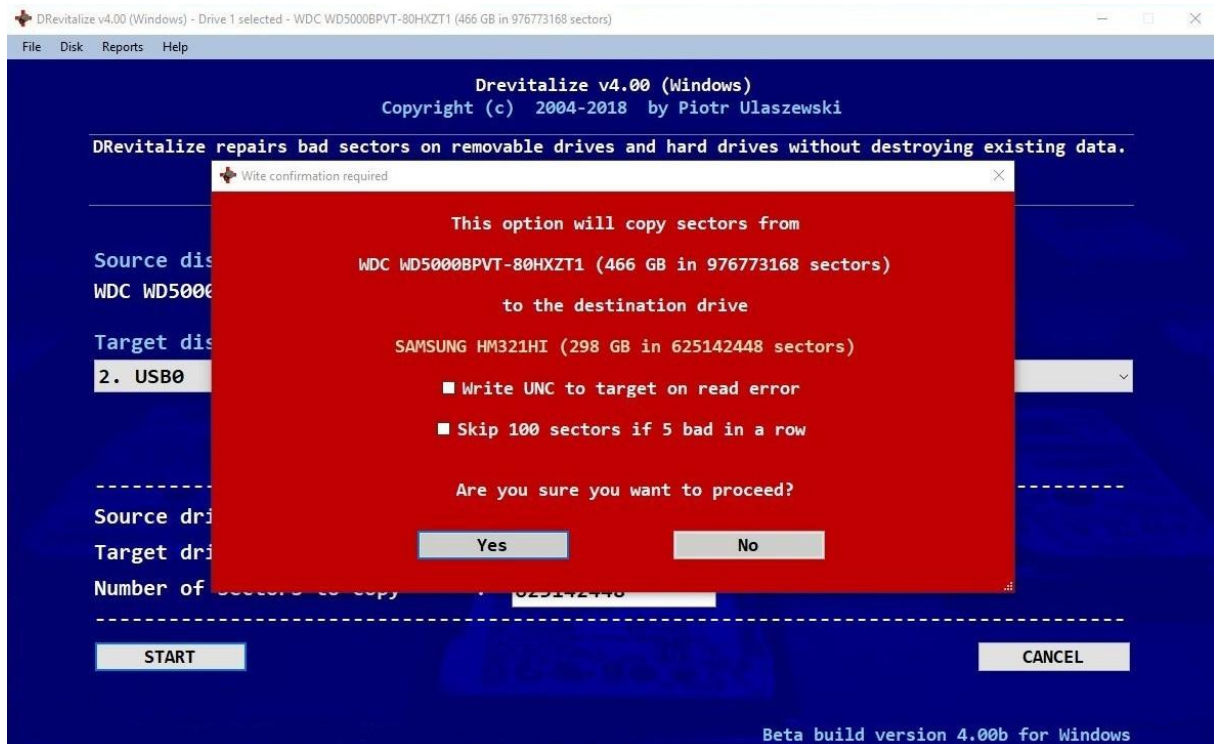


## COPY RAW DATA

### 4. Copy raw data to a destination drive.

This is a completely new function introduced in v3.13 of Drevitalize used to copy sector by sector one drive to another with the possibility to provide arbitrary source and target offsets as well as the desired amount of sectors to copy. Both progress bars from source and destination are shown on the screen at the same time. Please note that only the source progress bar is updated with possible error codes (**S** - slow, **B** - bad, **C** - corrected). Statistics with access time are updated on the fly like on the scan screen. An important fact to notice is the read errors value from the source drive which does not only show the amount of bad sectors on the source drive. If a second value is displayed in parenthesis next to the read errors value it means that the Drevitalize internal error correction mechanism was able to correct the read error on the fly and retrieve all information from the bad sector. In other words if the read error value is equal to the value displayed in parenthesis it means that despite bad blocks on source drive all data from the requested region was copied to the destination drive.

After selecting the destination drive, source drive offset and destination drive offset, the user will be presented with a confirmation menu.



**Write UNC to target on read error** writes a special UNC ATA command to destination drive if source drive sector was not recovered.

**Skip 100 sectors if 5 bad in a row** is a special copy speed up option for drives with many bad sectors. In this mode, copy will skip 100 sectors if 5 bad non recovered sectors are discovered one after the other.

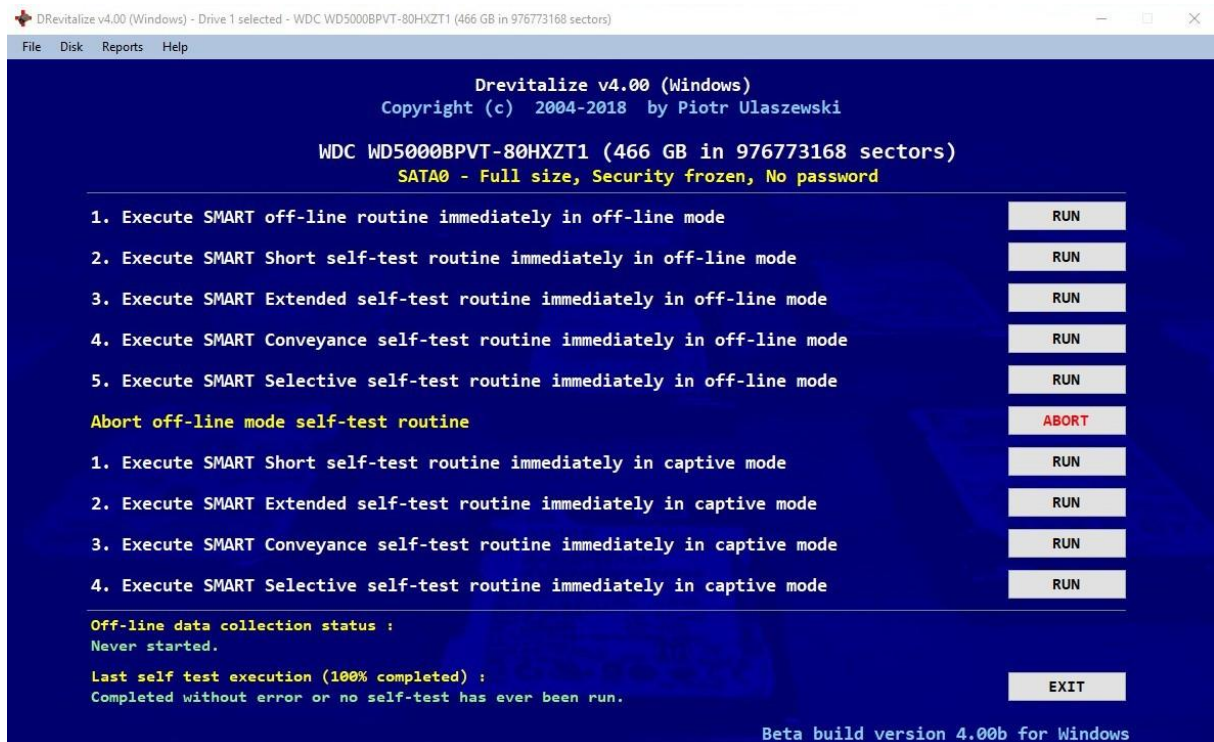
## SMART OPERATIONS

### 5. Display and analyze SMART data.

This is a pure information and statistics function with provides a detailed overview of the drive health. All good attributes are signaled with a green OK confirmation on the right side of the screen. Anything that is still good but suspicious and will probably soon need further attention is displayed in white. All bad attributes are signaled with a red BAD text. SMART WData is the default 16-bit word data shown in earlier versions of Drevitalize and SMART XData are the extended 4 bytes from the raw value field. Starting from version 3.24, Drevitalize will analyze the overall status of the drive and display the result either as : perfect drive, drive has warnings or defective drive.

### 6. Run SMART specific tests.

User has the possibility to select one of the available SMART self tests. Off-line mode tests execute in background. Captive tests execute in foreground and user needs to wait until they finish. Current drive status from offline data collection is displayed on the bottom of the page. Self test status and progress is also displayed on the bottom of the page and is updated periodically every 60 seconds if run in offline mode.



## FEATURES MENU

### 7. Features and firmware data.

This menu currently defines specific firmware related functions that can be executed. **Black commands** are universal ATA commands and should be supported on any type of ATA drive as part of the ATA standard. **Blue commands** are vendor specific ATA commands. Execution of those commands is only available for registered users. Vendor specific ATA command will execute never officially published ATA scripts based on the currently selected manufacturer. Each manufacturer has different set of vendor specific ATA commands. Currently the following vendor specific ATA commands are supported : format unit, clear defect reassign, SMART reset attribute values, ATA force password reset.

#### **Format Unit (vendor specific) :**

This vendor specific ATA command clears the defect reassign information (Grown Defect List) and initializes all user data sectors. This procedure follows the same ATA security requirements as secure erase with the exception that it does not need a password to execute. However, the command cannot be started in security frozen mode, security disabled via DCO mode or when security feature set is not implemented. Supported manufacturers : WD (Marvell), Hitachi, HGST, IBM, Fujitsu.

#### **Clear Defect Reassign (vendor specific) :**

This vendor specific ATA command clears the defect reassign information (Grown Defect List). It will not reinitialize all drive sectors. Supported manufacturers : WD (Marvell), Samsung, Toshiba, Fujitsu.

#### **SMART Reset Attribute Values (vendor specific) :**

This vendor specific ATA command clears the SMART table of known drives : WD (Marvell), Hitachi, HGST, IBM, Samsung, Toshiba.

#### **ATA Force Password Reset (vendor specific) :**

This vendor specific ATA command firmware resets unknown ATA password and unlocks the drive. Supported manufacturers : WD (Marvell), Samsung, Toshiba.

#### **Run Reverting to defaults after software reset (vendor specific) :**

This vendor specific ATA command is obsolete.

The standard ATA commands are : Read cache, Write cache, Host protected area, Secure Erase, Automatic Acoustic Management, Time Limited Error Recovery, SMART Functionality, SMART Attribute Autosave, SMART Automatic offline, SMART Save attribute values, ATA Set user password, ATA Set Master password, ATA Unlock Drive, ATA Disable password, ATA Security status, ATA Drive password status and all the SATA specific transition commands.



### Secure Erase :

The Secure Erase ATA feature set is a powerful and very dangerous ATA command. I would advise to do a secure erase using master password because the master password does not lock the drive if the procedure is suddenly stopped due to lack of power or some other unexpected reason. Therefore before starting this procedure please enter a master password with ATA security function : ATA Master Password.

Once the master password is set it needs to be reentered on secure erase dialog screen. This is because the procedure can also be used to unlock ATA drives with unknown user passwords but known master password. Some manufacturers have predefined master passwords that will work with secure erase if master password was not modified before.

If you decide to run secure erase with user password, a temporary user password with high security level will be set. This password is 'ABCDEF'. In case the procedure fails DRevitalize will try to automatically remove the password. However in case of loss of power it is impossible. The user will have to remove the password manually on next power up.

Please note that laptops/notebooks use a different ATA password system than the clean one used in DRevitalize. It is not possible to start a laptop with a drive on which the password was set by DRevitalize. If the user wants a password protected hard drive, he/she needs to set the ATA drive password either in the BIOS or in the specific laptop manufacturer utility. If the laptop is unable to start because of a failed ATA secure erase procedure, the only way to unlock the drive is to remove the drive from the laptop and connect it to a desktop PC or another laptop via USB and run DRevitalize specifying the required security options. Please note that only the Windows version is able to work with drives connected via USB.

## ATA Security :

This sub menu introduces new commands related to the powerful ATA security feature set. ATA Set user password, ATA Set Master password, ATA Unlock Drive, ATA Disable password, ATA Security status and ATA Drive password status. The first and second command locks the drive with user or master password (rev 0xFFFE), either in high security mode or maximum security mode. The difference between the two modes is that maximum security mode does not allow a drive to be unlocked with master password. In this case only secure erase can be started with master password. The third command unlocks a drive which is in security locked state. Either user or master password can be specified. However master password will only work if user password level is set to high. This command needs to be executed before trying to disable the password if drive is locked. The next command will unlock and disable the drive password in one operation, provided that the specified password is correct. Finally, the last two commands give status on current interface and drive.

## DEVICE CONFIGURATION OVERLAY

### 8. Device Configuration Overlay.

This menu allows to reduce the capabilities of the selected drive by modifying some of the optional commands, modes, and feature sets that a device reports as supported in the IDENTIFY DEVICE or IDENTIFY PACKET DEVICE data as well as the capacity reported. Selecting a specific feature will flag the action performed on it as either disable or enable depending on its current condition. After the required values are selected the user needs to run DCO modify function in order for the changes to take effect. DCO modify cannot be run 2 times in a row. Each DCO modify must be followed by a DCO restore to bring the drive back to its original state. Finally, executing DCO freeze will block the drive DCO functions.

Drevitalize v4.00 (Windows) - Drive 2 selected - SAMSUNG HM321HI (298 GB in 625142448 sectors)

File Disk Reports Help

Drevitalize v4.00 (windows)  
Copyright (c) 2004-2018 by Piotr Ulaszewski

SAMSUNG HM321HI (298 GB in 625142448 sectors)  
USB0 - Full size, Security open, No password

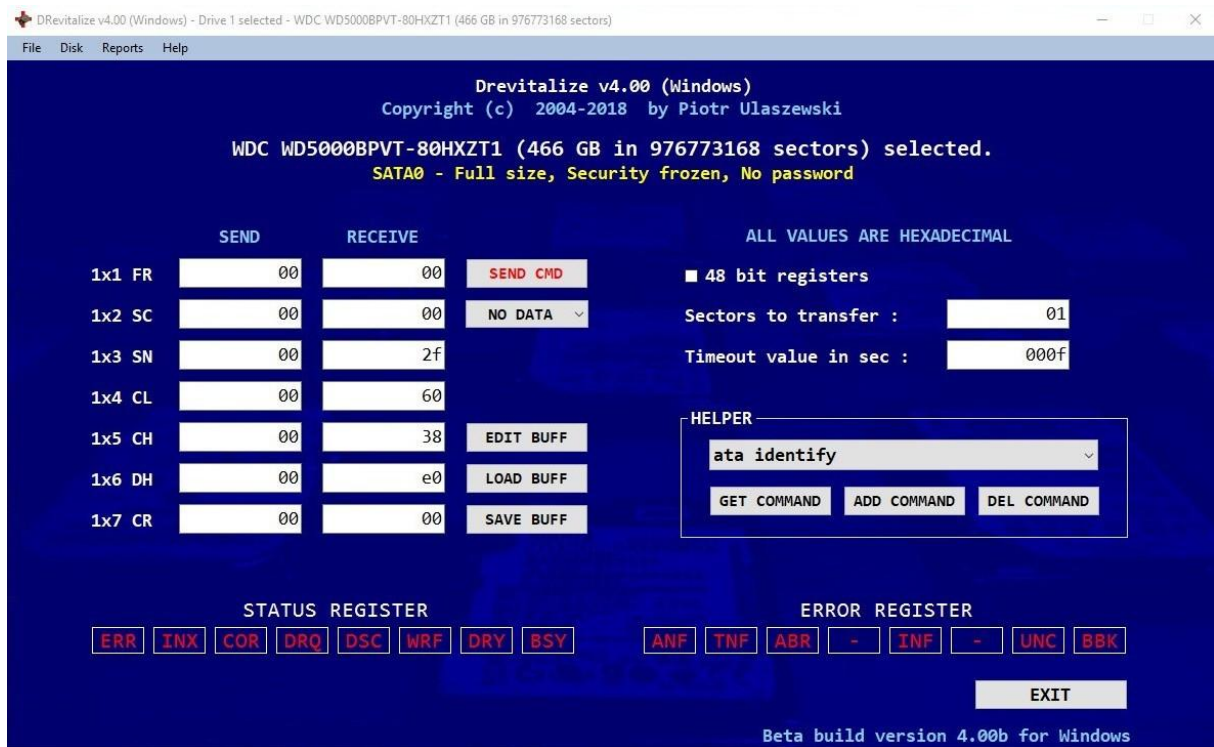
| Command/feature set allowed   | Status    | Change     | Action | Modify |
|-------------------------------|-----------|------------|--------|--------|
| SMART self test               | allowed   | supported  |        | modify |
| SMART error logging           | allowed   | supported  |        | modify |
| SMART selective self test     | allowed   | supported  |        | modify |
| SMART conveyance self test    | forbidden | no support |        | modify |
| SMART universal feature set   | allowed   | supported  |        | modify |
| PUIS Feature set              | allowed   | supported  |        | modify |
| Read/Write DMA Queued         | forbidden | no support |        | modify |
| Automatic Acoustic Management | forbidden | supported  |        | modify |
| Host Protected Area           | allowed   | supported  |        | modify |
| 48-bit addressing mode        | allowed   | supported  |        | modify |
| Security Mode Commands        | allowed   | supported  |        | modify |
| Streaming feature set         | forbidden | no support |        | modify |
| Time Limited Commands         | forbidden | no support |        | modify |

DCO SET      DCO RESTORE      DCO FREEZE      EXIT

DCO result : not run

Beta build version 4.00b for Windows

## ATA TERMINAL AND SCRIPTING INTERFACE



This is a completely new function introduced with DRevitalize 4.0. The **SEND** column is made of registers that will be sent to the ATA drive after pressing "**SEND CMD**" button. The RECEIVE column is made of registers that will receive values after the ATA command is executed. Below the "**SEND CMD**" the user specifies what type of data transfer he/she needs. Those can be either **NO DATA**, **GET BUFF** or **SEND BUFF**. **NO DATA** does not transfer any data from or to the buffer. **GET BUFF** and **SEND BUFF** are quite clear too. They either get a buffer from the drive or send a buffer to the drive. Depending on the "sectors to transfer" value on the right side of the screen. If "sectors to transfer" is 2, that means 2 sectors (2 \* 512 bytes) will be sent or read from the drive on each command requiring data transfer.

**EDIT BUFF**, **LOAD BUFF** and **SAVE BUFF** are easy to understand too. **EDIT BUFF** will show the current buffer in hex editor, with the possibility to modify it. **LOAD BUFF** and **SAVE BUFF** will respectively load and save the buffer as bin file, depending on the number of "sectors to transfer" value.

The mode of operation can be either 24 bit or 48 bit. "Timeout value in seconds" can be raised to 0xFFFF = 65535 seconds.

The HELPER set of functions allows to remember specific ATA commands defined earlier. **GET COMMAND** gets the ATA command from the helper.ini file. **ADD COMMAND** adds a command to the helper.ini file. **DEL COMMAND** deletes the selected command from the helper.ini file. The helper.ini file is created in the same directory as the DRevitalize application when the first ATA command is added with **ADD COMMAND**.

## ERROR AND STATUS REGISTERS USED IN DREVITALIZE

### WINAPI ERROR CODE

| WINAPI L (0-8) |                         | WINAPI H (9-16) |                   |
|----------------|-------------------------|-----------------|-------------------|
| ACD            | Access Denied           | WRF             | Write Fault       |
| IND            | Invalid Drive           | RDF             | Read Fault        |
| WRP            | Write Protect           | GEF             | General Failure   |
| NRD            | Not Ready Drive         | SHV             | Sharing Violation |
| CRC            | Cyclic Redundancy Check | LOV             | Lock Violation    |
| SEE            | Seek Error              | DRL             | Drive Locked      |
| NDD            | Non DOS Disk            | OPF             | Open Failed       |
| SNF            | Sector Not Found        | BSY             | Busy              |

### SCSI SENSE KEYS

| SCSI SENSE L |                 | SCSI SENSE H |                 |
|--------------|-----------------|--------------|-----------------|
| NS           | No Sense        | BC           | Blank Check     |
| RE           | Recovered Error | FE           | Firmware Error  |
| NR           | Not Ready       | CA           | Copy Aborted    |
| ME           | Media Error     | AC           | Aborted Command |
| HE           | Hardware Error  | EQ           | Equal           |
| IR           | Illegal Request | VO           | Volume Overflow |
| UA           | Unit Attention  | MC           | Miss-compare    |
| DP           | Data Protect    | CD           | Completed       |

## ATA REGISTERS

| ATA STATUS REGISTER |                     | ATA ERROR REGISTER |                        |
|---------------------|---------------------|--------------------|------------------------|
| ERR                 | Error Bit           | ANF                | Address mark Not Found |
| INX                 | Index Bit           | TNF                | Track 0 Not Found      |
| COR                 | Corrected Data      | ABR                | Aborted                |
| DRQ                 | Data Request        | ***                | Not used               |
| DSC                 | Drive Seek Complete | INF                | ID Not Found           |
| WRF                 | Write Fault         | ***                | Not used               |
| DRY                 | Drive Ready         | UNC                | Uncorrected            |
| BSY                 | Busy Bit            | BBK                | Bad Block              |

### ATA STATUS REGISTER :

ERR - Error bit. If set the previous command ended in some type of error.  
 INX - Index bit.  
 COR - Corrected Data. If set an error has been encountered and the data has been corrected.  
 DRQ - Data Request. If set the drive is ready to transfer a word or byte of data between the host and the data port.  
 DSC - Drive Seek Complete. Set to 1 when the disc drive is not seeking.  
 WRF - Write Fault.  
 DRY - Drive Ready. If set the drive is ready to accept a command.  
 BSY - Busy bit. It is set to 1 when the drive has access to the command block.

### ATA ERROR REGISTER :

ANF - Address mark Not Found after finding the correct ID field.  
 TNF - Track 0 Not Found  
 ABR - Aborted  
 --- - Not used (reserved for removable media drives)  
 INF - ID Not Found  
 --- - Not used (reserved for removable media drives)  
 UNC - Uncorrected  
 BBK - Bad Block



## A FEW NOTES ABOUT REVITALIZING HARD DRIVES

ALMOST 75% OF HARD DISK DRIVES WITH DAMAGED SURFACE CAN BE REPAIRED IF :

1. The drive was not opened (it's surface was not contaminated).
2. The drive is always detected by the BIOS.

**IMPORTANT NOTE :** The use of this utility on a drive seldom detected by the BIOS may kill the drive completely!!! (usually such drives have their surface very seriously damaged and trying to revitalize it during more than 30-60 minutes may result in permanent not recoverable hard disk failure unless someone knows how to rewrite the disk firmware).

3. The drive surface does not contain scratches or other serious physical damage.
4. The drive read-write heads are not damaged.
5. The drive firmware is not damaged.

## REGENERATE HARD DRIVES WITH A LOT OF BAD SECTORS

1. Make sure you have your operating system installed on 100% trust worthy hard drive (with good S.M.A.R.T. status) not showing any bad sectors.
2. Install the faulty drive as slave or on the second IDE controller as standalone or connect it via eSATA cable (this is the best option).
3. Start the DRevitalize utility and check the drive SMART status. If the drive has reallocated sectors and data is not important it is advised to clear the defect reassign list from the Features/Firmware data menu. Surface recovery needs continuous non reallocated access for best effects.
4. Let the utility scan and revitalize the first Gigabyte (1024MB). Try at least 5 times when all bad sectors are not recovered. If there are still bad sectors on the drive after you run the utility 5 times please give the drive a break and start again after a few hours or the next day. If after running the utility more than 20 times the drive still shows bad sectors in the 1GB area then it's evident that the drive cannot be revitalized. Note that DRevitalize creates a log file with detailed info on recovered and non-recovered bad sectors.
5. Note on paper sectors that have problems and start Drevitalize with the appropriate sector offset. It may happen that recovered bad sectors may be detected as bad once again. If this is the case you should run the DRevitalize utility at least a few times on those sectors during 2 or 3 days.
6. Rerun the DRevitalize utility again on the next day specifying the areas recovered the day before. Make sure they do not contain bad sectors. Repeat this step for 5 consecutive days (this hard drive will store your data so it's better to be 100% sure it's ok).

7. Measure transfer speed on all areas of the disk and isolate potential surface problems (sector areas). If transfer speed is particularly low around a certain area try to move the data around (copy large files from one place to the other on the revitalized hard drive). You can run scandisk (with read/write - a complete surface scan too). Usually by moving the data around (read/write) the disk surface revitalized with this utility will further improve its condition.

Scan the entire disk surface with dedicated hard disk diagnostic utilities made by your drive manufacturer. Make sure the drive passes the surface scan test!

Thank You for using this software and reading the entire documentation.

Best regards,  
Piotr Ulaszewski