S E A G A T E

SeaTools Bootable User Manual

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Model:

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Introduction

REVISION: 12-Feb-2018

SeaTools Bootable v2.1.2

Welcome to Seagate's SeaTools Bootable Software!

This User Guide file contains important information about SeaTools. Please read this entire file before using this software.

SeaTools Bootable is a comprehensive, easy-to-use diagnostic tool that helps you quickly determine what is preventing you from accessing data on your desktop or notebook computer. It includes several tests that will examine the physical media on your Seagate, Maxtor or Samsung disk drive and any non-Seagate disk drive.

Why Use SeaTools

After testing, a large percentage of the drives returned to Seagate for warranty replacement are perfectly good drives with "No Problem Found" (NPF). Returning a drive for warranty service means system downtime and inconvenience for you in packing and returning your drive product. Before you send in a drive, it is in your best interest to determine if a replacement drive is really necessary. This hard disk diagnostic utility will help you make that determination and possibly save you time and money and preserve your data.

Some typical reasons for No Problem Found are:

- File System Corruption
- Driver Corruption
- Broken Master Boot Record
- Malware Attacks
- Hardware Conflicts

The Seagate SeaTools software is easy to load and simple to use. The following instructions will help you get the most out of this new software tool. If you have questions about this or any other Seagate software or service products, please contact your system supplier.

Using SeaTools

Do not remove the SeaTools USB device while the tests are running.

Run Seagate SeaTools

1. **Reboot your System**
   Insert the SeaTools USB device and reboot or power on your computer. The system willboot to the Linux operating system. If your system fails to boot, see the Troubleshootingsection #5 later in this file.

2. **Select Drives to Test**
   After SeaTools loads, the Drive List will show different storage devices in your system.Select the drives you would like to test. Make sure to choose the correct drive! Theselected drives will be highlighted in green.This screen also displays information about the drives such as the Model Number andSerial Number. Seagate model numbers begin with the letters "ST". Seagate serialnumbers are alphanumeric and eight characters long.

3. **Select a Test to Run**
   The menus provide an array of diagnostic tests. Select the test you would like to performon the selected drives

Basic Tests	Advanced Features
SMART Check	Acoustic Test
Short Drive Self Test	Set Max LBA
ShortGenericTest	Erase Overwrite Erase Write Same
Long Generic Test	Erase Sanitize
Fix All	SED Crypto Erase (PSID)

The S.M.A.R.T. Check examines the drive's S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) log, which is maintained by the drive during its normal operation, to quickly determine if the drive has previously encountered issues. A failure in this test is called a "SMART Trip" and is a near term prediction of failure. A warranty exchange is advisable when the SMART Check test fails.

Short DST, or Drive Self Test, is a thorough diagnostic routine that is built in to the hard drive's firmware. Firmware is the machine language installed on the disk drive which controls its behavior. DST is completely data safe. A warranty exchange is advisable when the Short Drive

Self Test fails.

Short Generic Test is similar to the DST in functionality, but is implemented in software, and does not require the drive to support any special commands. Short Test is completely data safe.

Long Generic Test scans the entire drive for defects. It will take a long time to complete. Because this test reads every sector on the drive, the amount of time required will depend on the speed and capacity of the disk drive. The highest capacity drives often take 3 to 5 hours per terabyte to complete. At any time, feel free to Cancel the test without harming the drive. Long Test is completely data safe.

The Fix All feature repairs bad sectors when possible. Fix All Fast and Long require the F8 key to be pressed which is your acknowledgement that SeaTools should attempt to repair any problem unreadable LBAs (sectors) it might detect. It is important to know that when the sector is bad and unreadable then any data in it is already lost. See "Help Topic: Bad Sector Found" for more information on this topic.

Acoustic Test - (Spin Down) Sometimes a defective hard drive makes unusual noise. However, often the power supply or CPU fans are mistaken for the hard drive. This test will spin down the drive just like a power management idle condition. If the drive was the source of the noise then the sound will stop. If the noise continues, you can eliminate the hard drive as the source.

Set Max LBA - Occasionally, a disk drive may be too large and its size needs to be reduced to a lower capacity. Similarly, a drive with a reduced capacity may need to be reset to its native maximum capacity. Three choices are available under this section

The **Advanced Tests** menu has options that could erase your data or make the drive unusable for your system. If you continue you could lose data.

feature erases the entire device by writing zero value to every sector. This operation will take a long time to complete, depending on the speed and capacity of the disk drive. **WARNING!!!** Any data on the drive will be lost. ZERO FILL DATA PATTERN WRITING IS A DATA DESTRUCTIVE OPERATION EQUIVALENT TO ERASING THE DATA OFF THE DRIVE.

Seagate is not responsible for lost user data. Erase Drive is available for Seagate, Samsung, LaCie or Maxtor drives only.

Caution: Boot drive detection is sometimes difficult so be careful to confirm that the boot drive is not selected.

Be very careful because using SeaTools Bootable Erase options will cause data loss. Seagate is not responsible for lost user data.

If this is your drive, you should always keep a current backup of your important data.

If this is not your drive and the original owner has no claim of ownership to it or the data stored on it, then you may still be responsible for the data in your possession. To protect yourself from potential liability and to protect the previous owner's privacy, you should remove all data by performing a data erasure on this drive.

Not all drives support the following advanced Erase commands. If the drive does support the command then the software will show a menu selection.

Erase Write Same - Use this option to start a WRITE SAME erase at the specified starting LBA. Use 0 for the starting LBA to mean the beginning of the drive. The last sector (Max LBA) on the drive is given at the top of the window. The Write Same data pattern will be all zeros (0000... etc) for the specified range.

Erase Write Same is faster than Erase Overwrite Full. This is especially true for erasing USB drives because Write Same can be three to five times faster.

On SCSI devices, this option uses the writesame16 command. On ATA devices, this uses the SCT writesame feature.

Erase Sanitize - Sanitize Overwrite on hard disk drives (HDD) takes a very long time to complete at approximately three (3) hours per TeraByte. Once this command starts it must finish the overwrite erase before normal use of the drive is returned. Even if a power reset is performed during overwrite erase the drive will continue from where it was stopped until it reaches the end of the of erasure. Automatic sector reallocation (repair) is permitted during the operation of this function.

SED Crypto Erase (PSID) - Self-Encrypting Drive Instant Secure Erase. If the drive supports hardware encryption, this menu will be displayed. Like Full Erase this command will permanently destroy access to all user data on the drive, but will do so by the erasure of the drive encryption key which takes only a few seconds to complete.

When SED Crypto Erase is selected the user will need to enter the PSID (Physical Security IDentification number) password located on the drive label. The PSID is a 32- digit number & capital letter sequence printed on the label. There is no electronic query for this number, therefore the drive must be removed in order to read the PSID number. Many drives have a PSID code on the label but are NOT marked as "Seagate Secure"; these drives do not support revertSP cryptographic erase.

Enter the PSID without spaces. FIVE attempts are allowed before a power cycle is required. It can

also be read by 2D barcode reader.

This SED Crypto Erase command is very fast at less than one (1) second. It changes the internal encryption keys that are used for user data causing all previous data to be useless. This operation performs an Opal SSC specification revertSP on a Self Encrypting Drive (SED). This operation is available on all Seagate SED drives which are marked on the label with the words "Seagate Secure". Upon completion, the drive will be "like new" with all user data being cryptographically erased and all other settings set to factory defaults.

See the Seagate Secure website (http://www.seagate.com/solutions/security/) for more information about Seagate Instant Secure Erase.

4. **Running the Diagnostics**
The SeaTools performs a data-safe test of the selected hard disk drive or device for possible malfunctions. Long tests may be aborted at any time. Press the ESC (escape key) from the keyboard.

During the "LONG Test" only, bad sectors (LBAs) may be detected. They could be part of a data file or even part of the operating system directory structure. Sometimes, problem sectors are empty or not in use. It is important to know that when the sector is bad and unreadable then any data in it is already lost. See section "Help Topic: Bad Sector Found" for more information on this topic.

5. **Test Information and Results**
Upon completion of running the diagnostics, the test results will be given. A log for each device is automatically saved if you have booted from a USB device.

The following conditions may apply:

- PASS
- FAIL
- ABORTED

6. **Log Files**

Test results are automatically saved in a log file with a file name based on the drive serial number. As you are using the applications, the contents of these logs will also be displayed in real time in the tabs in the lower right panel.

You may also view these logs by exiting the SeaTools Bootable application clicking on the small x icon in the upper left hand side of the screen. The terminal screen will show the names of the various serial number logs which are available on the USB drive. You can view these logs by using

the Linux "more" command by typing "more yourserialnumber.log" (do type in the actual serial number). After reading the log, press the q key to quit back to the command line. To restart SeaTools Bootable type the command "sudo ST4L --exitPowerOff". (Be sure to use the exact upper and lower case letters when you type a command in Linux.)

7. **Exit**
   To exit the program, select Exit from the main menu. This will automatically perform a shutdown of your computer. If the shutdown hangs, simply press and hold your computer's power button.

Error Codes

SeaTools Bootable may display a variety of error codes depending on the interface and which test module was running when the error or status occurred. In some situations when the drive is offline running a Drive Self Test, the drive gives its own DST result code. Drive Self Test (DST) is a thorough diagnostic routine that is built in to the hard drive's firmware. Firmware is the machine language programming the controls the disc drive. DST is completely data safe. SMART (Self Monitoring, Analysis and Reporting Technology) is also built in to the firmware and these errors provide advanced warning about developing problems - such as excessive retries while reading data. A SMART error is a prediction of possible drive failure in the future. Be sure to back up your data regularly. When a drive is completely non-functional, no make, model or error codes are available.

Help Topic: "Bad Sector Found"

IMPORTANT: Please read and carefully consider all of the following information about your "Bad Sector Found" options.

A bad sector is a small area on the disc drive that is reporting errors and cannot be accessed properly. New bad sectors, sometimes called grown defects, are often caused by some kind of physical damage. If a file or folder uses this sector, then the file is already incomplete or corrupt because the bytes are not readable.

*** NOTE **** The following information applies only to Seagate Technology, Samsung or Maxtor brand disk drives:

When SeaTools discovers a bad sector through reading, at the end of the scan it displays a list of the bad sectors.

If a sector is in use, then that file is incomplete or corrupt. When a bad sector happens to align with a folder or directory listing structure, then the links to files and sub-folders it manages may be broken. Sectors are often not in use.

You should carefully consider the importance of your data. While the sector is currently unreadable, if the file or folder is important to you then you may need professional recovery services to possibly reclaim the data. In this case, select NO to exit without trying to reallocate blank replacement sectors on the drive.

If you have decided that the file or folder is replaceable, already backed up or just not important to you, then you can tell SeaTools to attempt to overwrite the sector.

By design, modern disc drives maintain spare sectors for reallocation purposes. Usually, sectors become difficult to read long before they become impossible to read. In this situation the actual data bytes in the sector are preserved and transferred to the new spare during a sector reallocation. Similarly, when a disc drive writes data and encounters a problem, the drive firmware retires the problem sector and activates a replacement before giving successful write status.

If you give permission to overwrite a bad sector SeaTools will attempt to write a pattern of zeros to that sector. Usually, this action will assist the disc drive firmware in managing the problem by retiring the problem LBA and activating a spare in its place.

Note: Seagate Technology is not responsible for lost user data.

Troubleshooting

- **Drive Not Detected**
  - Understandably, a dead drive cannot communicate with the system or software and will not be detected. A drive with damaged electronics may have the appearance of running but be broken in the ability to communicate with the system. Either of these cases is a failed drive.
  - One of the most common reasons for a new drive to not be detected is with the setup of the cables and jumpers, if any. Another common area is with the system BIOS setup. The drive needs to be set to ON in the BIOS, this is especially true when adding a second drive. Be sure to double check if these items are correct.
  - Occasionally, a working drive will not be detected by the software. Disk drives attach to the computer through a section of circuitry on the motherboard called a controller. The software is designed to be as up-to-date as possible with known controllers. The drive is not by detectable in this case because of an unknown controller.
- **SeaTools Will Not Load**
  If when you insert the SeaTools USB device and power on the computer, it does not load SeaTools, the "boot sequence" may be set to boot to the hard disk drive first.
  To change the boot sequence to boot from the USB device drive first, you must enter the "Setup" or "CMOS Setup" of your computer. Methods for entering the Setup or CMOS Setup vary depending on your computer's make and model, but most methods consist of pressing a key or key sequence during the initial power on boot sequence.
  Watch the screen closely during boot up for a message like "Press F2 to enter Setup" or something similar to determine which key or key sequence to press for your computer. Nearly all systems will continue on automatically after a brief period of time if the key is not pressed, so act quickly. You may have only a few seconds to find and press the appropriate key or key sequence.
  The most common keys or key sequences to enter setup are:
  - [F2]
  - [DELETE]
  - [F1]
  - [CTRL]-[ALT]-[S]
  - [CTRL]-[ALT]-[ESC]
  - [CTRL]-[ALT]-[ENTER]
  NOTE: Some computers that use the "[CTRL]-[ALT]-[___]" sequences must be at a prompt before pressing the keys. If you are unsure about how to enter the setup, see the owner's manual for your computer or seek assistance from your computer manufacturer or the store where you purchased the computer./li>
- **If You Call**
  If you call to report problems please provide as much information as possible. If you can, please provide the following details:
  - When does the problem occur?
    - On the boot up of the diagnostic operating system?
    - During the hard disk drive tests?
    - After exiting SeaTools?

- Can the problem be recreated? If so, please outline the steps necessary to recreate it.
- What is your system configuration? List the details about your system as tested. Such as:
    - Make, model, processor and system memory
    - Hard disk drives (internal and external) connected to the system, including make, model, size, and type
    - Make and model of hard disk drive controllers
    - Make and model of the video adapter
    - Additional adapter cards, including sound and multimedia
    - Peripherals attached (mouse, tape backup, printed, etc)

Known Limitations

- SeaTools may not find or access hard disk drives when CMOS is set to "none" for those drives.
- SeaTools Bootable cannot find a drive that is completely non-functional. No make, model or error codes are available. If the drive is under warranty, you can contact your system supplier.
- SeaTools may not find a drive that is connected to an unsupported, usually very new, chipset.

Check http://www.seagate.com often for new and updated versions of SeaTools Bootable software as well as updates to the "Frequently Asked Questions" (FAQ's) list. Seagate will continue to add new features, functions and capabilities to this software.

Revision History

v1.0.0   1-Mar-2013   Initial public release of SeaTools Bootable

v2.0.4   23-Nov-2015   Updated graphical user interface. Added new erasure tests.

v2.0.5   30-Aug-2016   Updated localization and help documents

v2.0.7   02-Dec-2016   Updated localization and help documents.

v2.0.8   10-Sep-2017   Updated localization and help documents. Keyboard compatibility issues.

v2.0.9   11-Jan-2018   Updated SeaTools libraries.

v2.1.2   07-Feb-2018   Converted to opensea libraries.

Support and Open Source Statement

Seagate offers technical support for disk drive installation. If you have any questions related to Seagate products and technologies, feel free to submit your request on our web site. See the web site for a list of world-wide telephone numbers.

This software uses open source packages obtained with permission from the relevant parties. For a complete list of open source components, sources and licenses, please see our Utility FAQ for additional information.

SeaTools Bootable uses libraries from the opensea source code projects. These projects are maintained at http://github.com/seagate The libraries in use are opensea-transport and opensea-operations. These libraries are available under the Mozilla Public License 2.0.

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Screenshots

SEAGATE

*** WARNING ***

If this is your drive, you should always keep a current backup of your important data.

If this is not your drive and the original owner has no claim of ownership to it or the data stored on it, then you may still be responsible for the data in your possession. To protect yourself from potential liability and to protect the previous owner's privacy, you should remove all data by performing a data erasure on this drive. The selection to do this is found under SeaTools menu Advanced Features - Erase Drive - Zero All.

Seagate Technology is not responsible for lost user data.

See below for the SeaTools Bootable End User License Agreement. You can review the End User License Agreement at any time by selecting the License option from the Help menu.

END USER LICENSE AGREEMENT
FOR SEAGATE SOFTWARE

PLEASE READ THIS END USER LICENSE AGREEMENT ("EULA") CAREFULLY. BY CLICKING "I AGREE" OR TAKING ANY STEP TO DOWNLOAD, SET-UP, INSTALL OR USE ALL OR ANY PORTION OF THIS PRODUCT (INCLUDING, BUT NOT LIMITED TO, THE SOFTWARE AND ASSOCIATED FILES (THE "SOFTWARE"), HARDWARE ("HARDWARE"), DISK (S), CD-ROMS, OR OTHER MEDIA)

| I Do Not Accept | I Accept |

SEAGATE

SeaTools Bootable

File | Basic Tests | Rescan | Advanced Features | Language | Help | Exit

Drive List

		Model ID	Serial Number	Revision	Test Progress	
☐		VBOX HARDDISK	VBb06cf91b-2863a6de	1.0	0%	⊗
☐		VBOX CD-ROM	VB2-01700376	1.0	0%	⊗
☑		Backup+ Mac SL	DB00P5AN	0806	0%	⊗

10:28:37

File

Exit

WARNING!

The Advanced Tests menu has options that could erase your data or make the drive unusable for your system. If you continue you could lose data.

Be sure to back up all critical data before using any Advanced Test.

Seagate is not responsible for lost user data.

Please read the help files or contact Seagate Technical Support before using Advanced Tests.

Press F8 to enable Advanced Tests. Click Cancel to go back to Basic Tests.

Contact Seagate Technical Support

Cancel

ress

10:31:03

SEAGATE

SeaTools Bootable

File	Basic Tests	Rescan	Advanced Features	Language	Help	Exit

Spin Down

☐ Set Max LBA

Erase ▶

		Model ID	Se	Revision	Test Progress	

Overwrite Full

Boot Tracks

Range

Time

☐		VBOX HARDDISK	VBb06cf91b-2863a6de		0%	⊗
☐		VBOX CD-ROM	VB2-01700376		0%	⊗
▣		Backup+ Mac SL	DB00P5AN	0806	0%	⊗

10:31:43

SEAGATE

SeaTools Bootable

File

Exit

Welcome to Seagate's SeaTools Bootable Software!

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SeaTools Bootable is a comprehensive, easy-to-use diagnostic tool that helps you quickly determine what is preventing you from accessing data on your desktop or notebook computer. It includes several tests that will examine the physical media on your Seagate, Maxtor or Samsung disc drive and any non-Seagate disc drive.

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Why Use SeaTools?

After testing, a large percentage of the drives returned to Seagate for warranty replacement are perfectly

OK

10:34:59

Select Language

License Agreement

Close window

Full flash drive

About

View Log

Help

1st Warning

2nd Warning

License Agreement

Erase Time

Set Max LBA

Erase Range