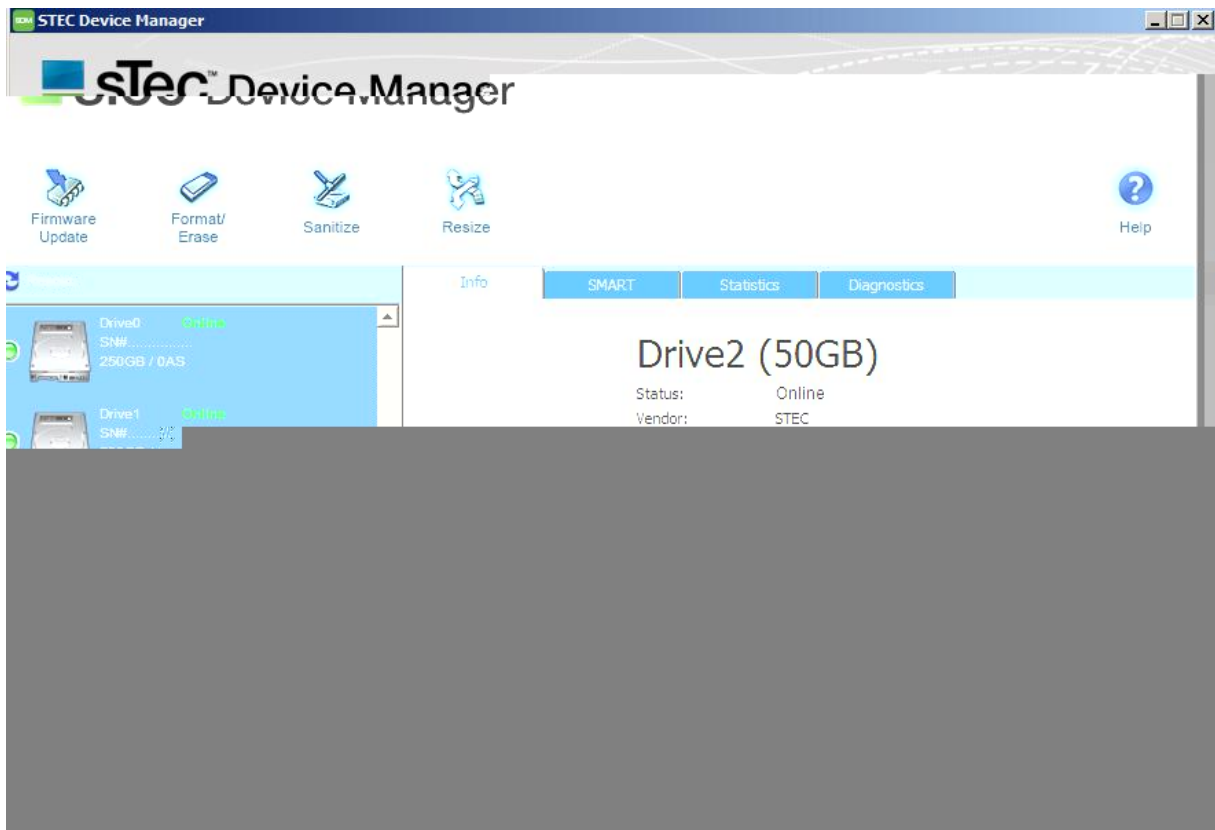




STEC DEVICE MANAGER USER GUIDE VERSION 2.0.0.130



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| CONVENTIONS | | DESCRIPTION |
|---------------------------|---|--|
| CAUTION |  | This icon denotes the use of extreme caution and the user must exercise good judgment according to previous experience before advancing to the next procedure. The icon also indicates the existence of a hazard that could result in equipment or property damage, or equipment failure if the instructions are not observed. |
| NOTE |  | This icon denotes additional or related information that the user may find useful. It also identifies any information that relates to the safe operation of the equipment, software, or related items. |
| Bold | Text | Used to indicate important technical notes . |
| <i>Bold Italic</i> | <i>Text</i> | Used to indicate <i>critical instructions</i> . |
| Light Blue | Text | 8 VHG WR LQGLFDWH D K\SHUOLQN R subtopic. In addition, the text may be bold . |
| Dark Blue Bold | Text | 8 VHG WR LQGLFDWH D K\SHUOLQN R subtopic. In addition, the text by be <i>bold italic</i> . |

REVISION HISTORY

| REVISION STATUS SUMMARY SHEET | | | |
|-------------------------------|------------|---------|--|
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| 2.1 | 09/07/2012 | All | Preliminary release. |
| 2.2 | 10/12/2012 | ii | Export Administration Regulations statement clarified. |
| | | 15 | Table 1; added sTec ZeusRAM to list of supported products. |
| | | 17 | Table 2; updated build number to 2.0.0.118 for archives. |
| | | 32 | Figure 5; SMART Panel-SCSI Panel interface updated to UHIOHFW QHZ RSWLRQ RI ³&OHDU 6PD |
| | | 32 | Topic; Clear Smart Alerts developed. |
| | | 44 | Table 7; ClearSmartAlerts subcommand added to listing. |
| | | 50 | Topic; ClearSmartAlerts developed for SDMCLI reference. |
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| | | ii-79 | Headers; removed CONFIDENTIAL from all headers. Obsolete specification. |
| | | | Footers; updated part number and revision date. |
| | | 77 | Contact Information page updated. |
| 2.4 | 04/05/2013 | All | General review and edit. |
| | | All | Screenshots have been updated according to new convention. |
| | | Front | Title page information updated. |
| | | Footers | Footer information updated. |
| | | 14 | Table 1; updated supported family product listing. |
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Figure 1: sTec Device Manager

OVERVIEW

Welcome to the sTec Device Manager (SDM). The SDM is designed to efficiently assist in the administration of sTec Solid-State Drive (SSD) and Solid-State Accelerator (SSA) devices. While many IT organizations have embraced the benefits of solid-state technology, many of the current hard disk drive utilities have proven woefully inadequate in the management of enterprise solid-state devices. SDM provides the ability to easily update and configure sTec SSDs and SSAs.

AUDIENCE

This user guide is intended for system administrators, network administrators, and other IT professionals. It is therefore written specifically for a technically advanced audience; it is not intended for end-users that will eventually purchase the commercially available product. The *user*, as referenced throughout the manual, is primarily concerned with industrial, commercial and military networking applications.

SUPPORTED PRODUCTS

The SDM can update and configure the following sTec SSDs and SSAs as outlined in Table 1.

Table 1: Supported Products

| PRODUCT FAMILY | GENERATION | DESCRIPTION |
|------------------|------------|--|
| s1120, s1122 | Gen2 | PCIe 2.1 x4 Lane Solid-State Accelerators (SSAs). |
| s620 | Gen2 | SATA (SATA II) Solid-State Drives (SSDs). |
| ZeusRAM | Gen3 | ZeusRAM SAS (Serial-Attached SCSI) Solid-State Drives. |
| s440 | Gen4 | Fiber Channel (FC) Solid-State Drives (SSDs). |
| s840, s842, s846 | Gen4 | SAS (Serial-Attached SCSI) Solid-State Drives (SSDs). |

FEATURES

| FEATURE | DESCRIPTION |
|---------------------------|---|
| Cross-Platform Solution | Simplifies the management of sTec SSDs and SSAs in Windows and Linux enterprise environments. |
| GUI Drive Management | Manage sTec SSDs and SSAs using a user-friendly GUI interface. |
| CLI Drive Management | An alternate command line interface that supports the use of Windows batch files and Linux scripts to automate tasks. |
| Drive Health Check | SDM GUI is capable of manual or scheduled health checks to monitor the health and state of sTec SSDs and SSAs. |
| SDM Log File | SDM generates a log file to assist in the diagnosis of drive issues. |
| Multiple Drive Management | Simultaneous management of multiple drives, i.e., firmware download, sanitize and format, etc., for different drives. |

SPECIFICATIONS

| SPECIFICATION | DESCRIPTION |
|----------------------------------|---|
| Overview | Software solution that is independent of host hardware for managing multiple sTec drives. |
| Solid-State Device Compatibility | Any sTec SAS, Fibre Channel, PCIe and SATA solid state drive. |
| Operating Systems | Microsoft Windows Server 2008 R2, 64-Bit. Linux Distributions ±OEL 5.6, RHEL 5/6, SUSE Enterprise 11, 64-Bit. |
| Capabilities | All inclusive sTec SSD management solution; firmware upgrades, format, sanitize, capture field data and drive statistics, retrieve S.M.A.R.T. data. |
| Management | GUI or CLI utilities to manage solid-state devices. |

OVERVIEW

This section addresses issues regarding the compatibility, system requirements, installation and configuration of sTec Device Manager (SDM).

PREREQUISITES



The prerequisite software described below should be installed and configured before you install SDM.

OPERATING SYSTEMS

| PREREQUISITE | DESCRIPTION |
|--------------------------|---|
| Microsoft Windows | Microsoft Windows Server 2003, Standard/Enterprise, 32-bit or 64 bit. Microsoft Windows Server 2008, Standard/Enterprise, 32-bit or 64-bit. Microsoft Windows XP, SP1, SP2, 64-Bit Extended |
| Red Hat Enterprise Linux | Red Hat Enterprise Linux (RHEL) 5 64-bit Red Hat Enterprise Linux (RHEL) 6 64-bit |
| SUSE Linux | SUSE Linux Enterprise Server (SLES) 11, 64-bit |
| Oracle Linux | Oracle Enterprise Linux (OEL) 5.6 |

JAVA VIRTUAL MACHINE

| PREREQUISITE | DESCRIPTION |
|--------------|---|
| Java SE | Java SE 6 or later. Latest version of Java Virtual Machine (JVM) installed on the local system to run the SDMGUI. Web: http://www.java.com/en/download/index.jsp |

USER PRIVILEGES

| PREREQUISITE | DESCRIPTION |
|---------------------|---------------|
| Microsoft Windows | Administrator |
| Linux Distributions | Root |

SYSTEM HARDWARE REQUIREMENTS

| ITEM | DESCRIPTION |
|-----------------|---|
| CPU | Intel Itanium 2, Xeon or equivalent 64-bit processor, 1.4GHz minimum clock speed. |
| Memory | 512MB RAM, 1TB (Enterprise, Datacenter), 2TB (Itanium-based systems). |
| Hard Disk Drive | 10GB available disk space minimum (40GB or greater). |
| Network | Internet connection required for downloads and upgrades. |
| Optical Drive | CD-ROM/DVD-ROM optional. |
| Display | Super VGA (1024 x 768) or higher resolution monitor. |
| Peripherals | Keyboard and Mouse (Printer optional). |

ARCHIVE FILES

The SDMGUI and SDMCMD interfaces are encapsulated within archives for both the Windows and Linux platforms. An authorized sTec representative will e-mail the desired SDMGUI or SDMCMD to the user. The archives must be unpacked in a default directory or a temporary directory. It is recommended that the user create the default or temporary directories off the root of the drive hierarchy. Table 2 lists the available archives and descriptions.

Table 2: SDM Archive Descriptions

| STEC PART NUMBER | ARCHIVE NAME | DESCRIPTION |
|------------------|---------------------------|---|
| 66000-00017-003 | sdmcmd.2.0.0.130.zip | SDM Command Line for Windows, 32-bit |
| 66000-00018-003 | sdminstall.2.0.0.130.zip | SDM Graphical User Interface (SDMGUI) for Windows and Linux systems, 32-bit and 64-bit. |
| 66000-00019-003 | sdmcmd.2.0.0.130.tar.gz | SDM Command Line for 32-bit Linux systems. |
| 66000-00020-003 | sdmcmd64.2.0.0.130.tar.gz | SDM Command Line for 64-bit Linux systems. |

LOG FILES

The log file, *sdmlogfile.txt*, contains a history of all actions performed by the SDM, both for SDMGUI and SDMCMD. Each log entry has a date and time stamp that correlates with the action. The log file resides in the SDM default directory, which is platform dependent. Table 3 lists the default locations.

Table 3: SDM Log File Default Locations

| PLATFORM | LOCATION |
|------------|----------------------------------|
| Linux | \$HOME (usually /home/username). |
| Windows | \$USERPROFILE |
| Windows 7 | \Users\Username |
| Windows XP | \Documents and Settings\Username |

The following is an excerpt of a log file. Log files can be used for timing various operations.

```

20110224 113544.271      API      GetInfo target=gen3sas:Drive1
20110224 113544.271      SCSI transaction for sdmScsiGetInfo Inquiry Page 0
20110224 113544.271      Before State           : SetUp
20110224 113544.271      Before Command         : INQUIRY
20110224 113544.271      Before CDB             : 12 00 00 00 ff 00 len=6
20110224 113544.271      Before DataDirection   : DeviceToHost
20110224 113544.271      Before DataBuffer      : 0022f708
20110224 113544.271      Before DataLength      : 255
20110224 113544.271      Before Timeout         : 0
20110224 113544.271      Before SSRCB has not been executed yet
20110224 113544.271      Before StatusByte      : 00 GOOD
20110224 113544.271      Before SenseData       : len=0
20110224 113544.271      Before DataXferred     : 0
20110224 113544.271      SCSI done for sdmScsiGetInfo Inquiry Page 0, rc=0

```

SDMCMD INSTALLATION

The following procedures are for the installation of the SDM Command Line Interface (CLI) or SDMCMD. Please see the [SDMGUI Installation](#) if you want to install the SDM GUI under Windows or Linux.

WINDOWS INSTALLATION

To install the SDM Command Line Interface (SDMCMD) under Windows:

1. Create a directory of **C:\>SDMCMD** (or any other desired directory name).
2. Unzip the contents of the **sdmcmd.2.0.0.130.zip** file in the directory.
3. See the **SDMCMD** section in this manual for command syntax and usage.

LINUX INSTALLATION

To install the SDM Command Line Interface (SDMCMD) under Linux:

1. Create a directory of **/SDMCMD** (or any other desired directory name).
2. Unpack the contents of:
 - a. The **sdmcmd.2.0.0.130.tar.gz** file (32-bit Linux systems) in the directory, or;
 - b. The **sdmcmd64.2.0.0.130.tar.gz** file (64-bit Linux systems) in the directory.
3. See the **SDMCMD** section in this manual for command syntax and usage.

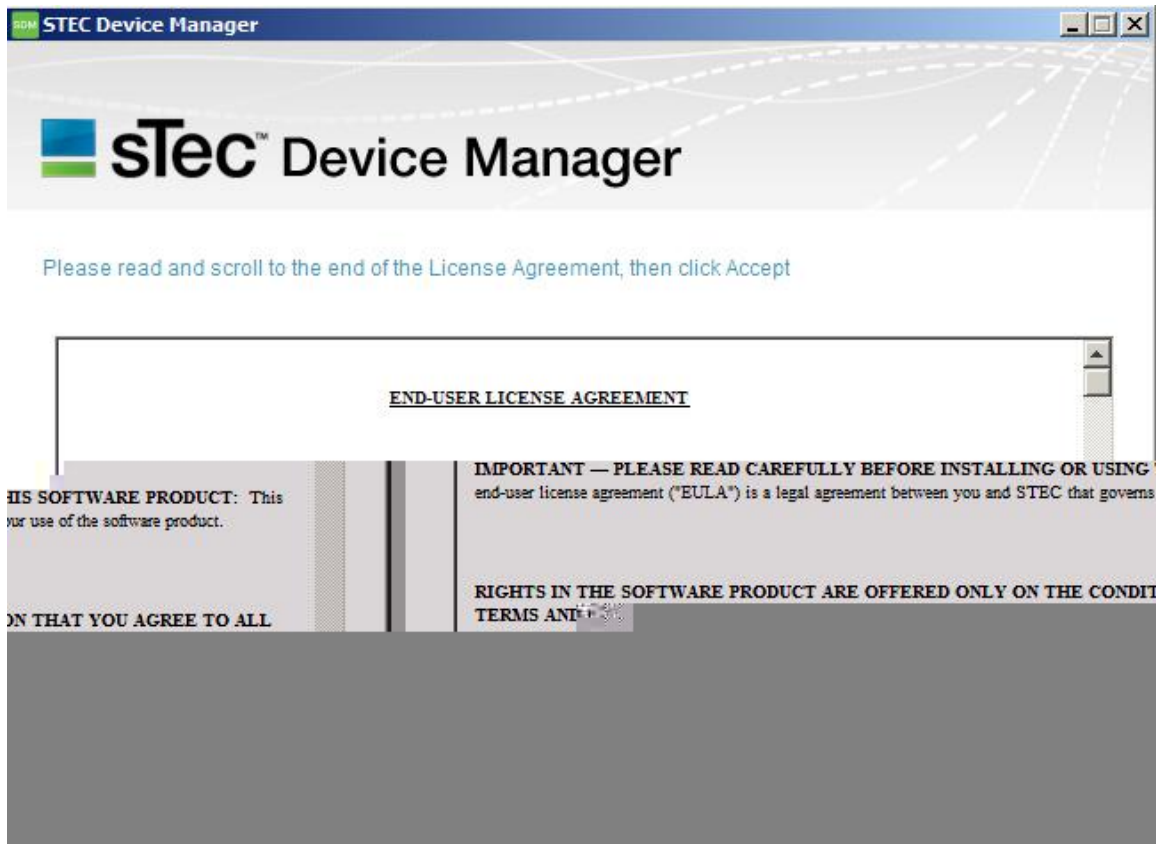
SDMGUI INSTALLATION

The following procedures are for the installation of the SDM Graphical User Interface (GUI) or SDMGUI. Please see the *[SDMCMD Installation](#)* if you want to install the SDM CLI under Windows or Linux.

WINDOWS INSTALLATION

To install the SDM Graphical User Interface (SDMGUI) under Windows:

1. Create a temporary installation folder or directory.
2. Unzip the contents of **sdminstall.2.0.0.130.zip** into the temporary directory. Make sure to extract all the files before performing the remaining steps.
3. Double-click the **sdminstall.2.0.0.130.jar** file. The End-User License Agreement will appear. You must read and scroll to the end of the License Agreement to activate the **Accept** option.



4. Click **Accept** after the option becomes available. The installer will prompt you to choose the location of the working directory. The default path will appear in the **Current working directory:** text box. You can use the **Browse** option to navigate to an alternate installation directory.



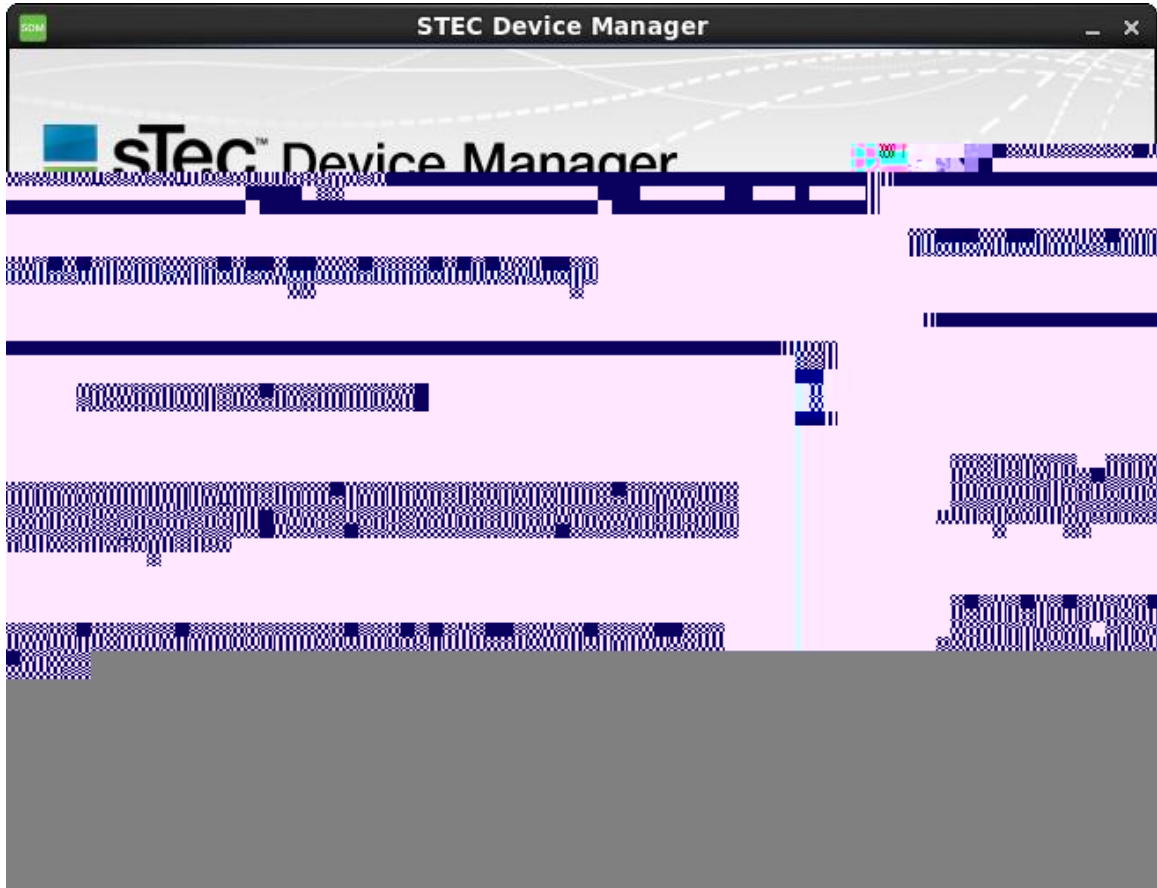
5. Click **Install**. The SDMGUI will be installed. The following message window will appear at the end of a successful installation:

6. Click **OK** to close the message window. There will be a sTec Device Manager icon on the desktop and a sTec Device Manager item installed in the Start menu. You may double-click the desktop icon or select the menu item to start sTec Device Manager.

LINUX INSTALLATION

To install the SDM Graphical User Interface (SDMGUI) under Linux:

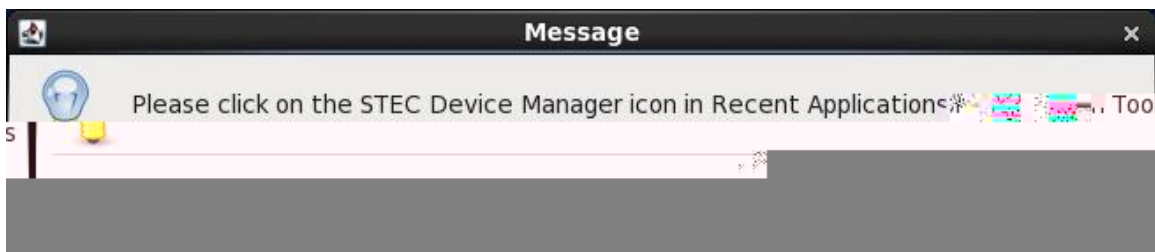
1. Create a temporary installation folder or directory.
2. Unzip the contents of **sdminstall.2.0.0.130.zip** into the temporary directory. Make sure to extract all the files before performing the remaining steps.
3. Double-click the **sdminstall.2.0.0.130.jar** file. The End-User License Agreement will appear. You must read and scroll to the end of the License Agreement to activate the **Accept** option.
4. If double-clicking the archive file does not work, open a Linux terminal window and use the following command: **java -jar sdminstall.2.0.0.130.jar**.



5. Click **Accept** after the option becomes available. The installer will prompt you to choose the location of the working directory. The default path will appear in the **Current working directory** text box. You can use the **Browse** option to navigate to an alternate installation directory.



6. Click **Install**. The SDMGUI will be installed. The following message window will appear at the end of a successful installation.



7. Click **OK** to close the message window. There will be a sTec Device Manager icon on the desktop and a sTec Device Manager item installed in the Start menu.
 - a. The SDM menu item will be found under Start Menu/Recent Applications or in System Tools/sTec Device Manager, depending on which version of Linux you are running. Selecting the menu item will start SDM.
 - b. You can double-click the sTec Device Manager desktop icon to launch the program.

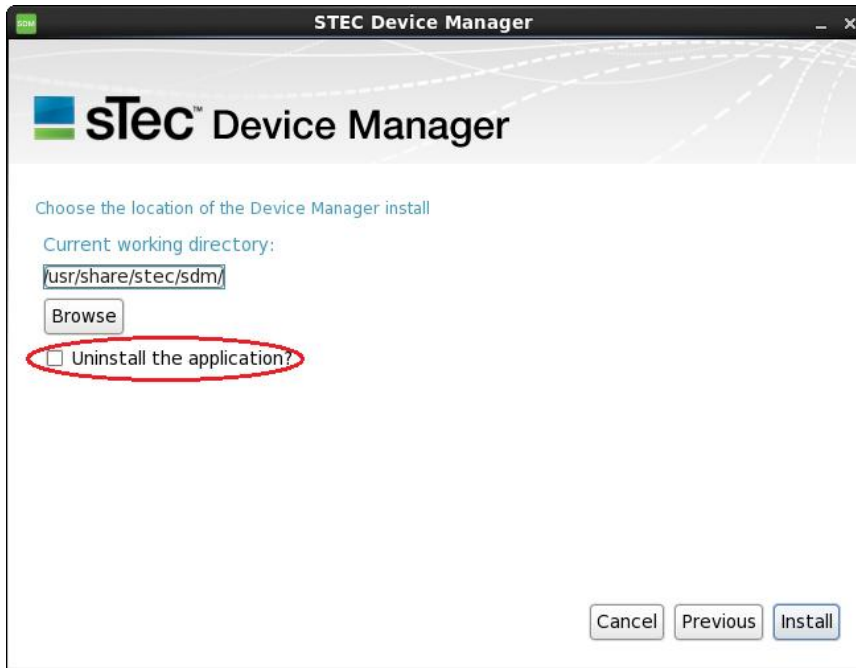
LINUX UNINSTALL PROCEDURE

If you want to remove the SDMGUI under Linux:

1. Double-click the **sadmininstall.jar** file. The End-User License Agreement will appear. You must scroll to the end of the License Agreement to activate the **Accept** option.



2. Place a check mark in the **Uninstall the application?** check box and then click **Install**. The SDMGUI, desktop icon and menu item will be removed from the system.



OVERVIEW

The sTec Device Manager GUI (SDMGUI) operates under both Windows and Linux. While the majority of illustrations in this section were taken in the Windows OS environment, there is no difference in the look or functionality of the SDMGUI.

STARTING SDM



If you install SDM onto a local system, a sTec Device Manager icon will appear on the desktop. Double-click the **sTec Device Manager** icon to launch the application. See [Navigating the GUI](#). See Figure 1.

NAVIGATING THE GUI

The SDM application window is divided into the following components: a toolbar, a Devices window and Information, SMART, Statistics, and Diagnostic panels.

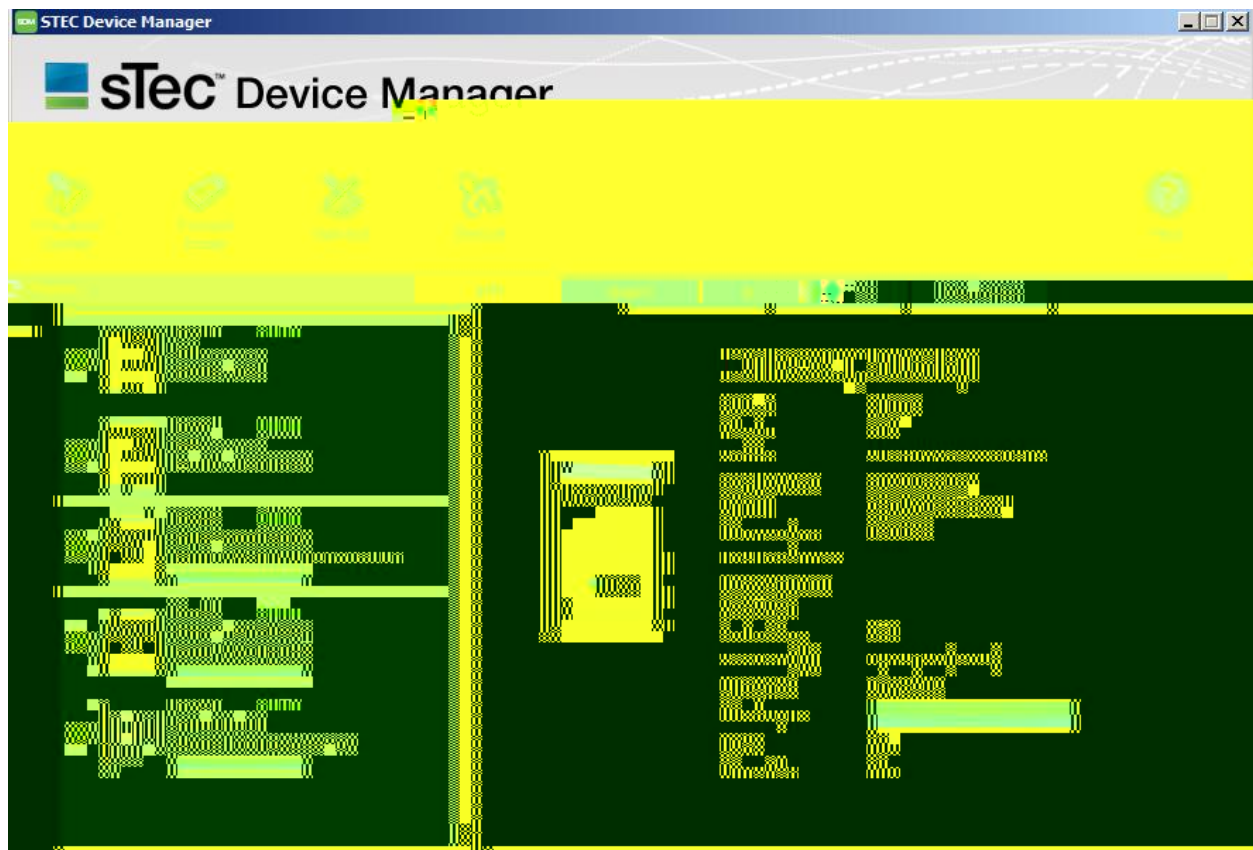


Figure 2: The SDM Graphical User Interface

DEVICES WINDOW



The user should only select sTec devices in the Device window. sTec cannot guarantee the reliability or functionality of SDM for non-sTec devices.



The Devices window lists all the HDDs and SSDs installed in the system. To manage a device, click its icon in the list.



Click the **Rescan** button to rescan the system for any new SSD or HDD devices and to refresh the drive listing.

IMPORTANT!

Make sure to select the correct device that you want to manage. Notice that the MACH16 is selected in the example to the left. This indicates that all operations will affect this device only.

Notes:

1. The system runs a health check every five (5) minutes. If a drive is busy (Sanitize, Resize, Format/Erase, Firmware Upgrade, etc.), the health check will show that the drive is busy. If the drive goes off-line, then the health check shows the drive as off-line.
2. If the user clicks the **Rescan** button, the off-line drive will be removed from the **Devices** window; however, if the drive is busy, the drive is still listed as busy.
3. If the user exits SDM and then re-starts SDM, any off-line drives and busy drives (which do not respond to host inquiries), are not shown in the **Devices** list.

TOOLBAR

Figure 3 shows the SDMGUI toolbar. The toolbar buttons allow access to the most commonly used SDM functions: *Firmware Update*, *Format/Erase*, *Sanitize*, and *Resize*.



Figure 3: The SDMGUI Toolbar

FIRMWARE UPDATE



Click the **Firmware Update** button to update the SSD firmware. See [Firmware Updates](#).

FORMAT/ERASE



Click the **Format/Erase** button to Format/Erase the SSD. See [Formatting a Drive](#).

SANITIZE



Click the **Sanitize** button to Sanitize the SSD. See [Sanitizing a Drive](#).

RESIZE



Click the **Resize** button to resize the sector count of the SSD. See [Resizing a Drive](#).

HELP



Click the **Help** button to view the on-line help system.

UTILITY PANELS

This section describes the Information, SMART, Statistics and Diagnostic panels and the relative options available in each panel. The user can access a specific panel by clicking its respective tab.

INFORMATION PANEL

The **Information (Info)** panel will display specific inquiry data. See Table 4 for the field descriptions. Each

| FIELD | DESCRIPTION |
|---------------------|--|
| Firmware Version | The firmware version that is currently loaded. |
| Boot Loader Version | The boot loader version. |
| HW Config Version | The hardware configuration version number. |
| XROM Version | The XROM version. |
| Sector Size | The sector size in bytes (512, 520, 524 or 528). |
| Max LBA (GB) | The maximum number of user-addressable logical blocks. |
| DIF Level | The DIF level and type. |
| Life Gauge | This graphical bar indicates the percentage of the life time remaining on the SSD or SSA. |
| PCIe | If managing a PCIe SSA, then the PCIe configuration appears in this field; RWKHUZLVH 31 \$' DSSHUV LQ WKLV ILHOG LI P |
| Driver Version | If managing a PCIe SSA, then the driver version appears in this field; RWKHUZLVH 31 \$' DSSHUV LQ WKLV ILHOG LI P |

S.M.A.R.T. SPECIFICATION

S.M.A.R.T. is an acronym for Self-Monitoring, Analysis and Reporting Technology and was originally developed for ATA devices. The specification has been adapted so that SCSI devices can support S.M.A.R.T. capabilities. SDM supports the S.M.A.R.T. specifications for ATA and SCSI.

SMART PANEL-SCSI DATA

Figure 5 shows the **SMART** panel listing all the log pages supported by a SCSI device.

| Info | | SMART | Statistics | Diagnostics | |
|------|------------------------------|--------|------------|-------------|--|
| Atr | Description | Status | Value | Threshold | |
| 0x01 | Read Error Rate | OK | 0 | 10 | |
| 0x02 | Write Error Rate | OK | 0 | 10 | |
| 0x03 | ECC Correction Rate | OK | 0 | 80 | |
| 0x04 | Erase Error Rate | OK | 0 | 10 | |
| 0xc2 | Temperature | | 54 | 75 | |
| 0xc4 | Free Blocks Percentage | OK | 93 | 10 | |
| 0x09 | Power-On Hours | N/A | 96 | N/A | |
| 0x12 | Power Cycle Count | N/A | 10 | N/A | |
| 0xe0 | Power Backup Condition | OK | N/A | N/A | |
| 0xe2 | ROM Check | OK | N/A | N/A | |
| 0xe3 | Wrong Firmware Fault | OK | N/A | N/A | |
| 0xe6 | Flash Die More Than Half Bad | OK | N/A | N/A | |
| 0xe9 | Estimated Remaining Life | OK | 100 | 0 | |

[Create Csv File](#) [Clear Smart Alerts](#)

Figure 5: SMART Panel-SCSI Data

SMART LISTING-SCSI DATA

There are four columns in the listing: **Attr (Attribute) Description, Status, Value** and **Threshold**. Table 5 describes each column found in the SMART panel.

Table 5: SMART Panel Listing-SCSI Data

| LABEL | DESCRIPTION |
|-------------|---|
| Attr | The Attr (Attribute) column lists the Attribute IDs. |
| Description | The names of the supported log pages. |
| Status | The current status as reported by the drive. |
| Value | This column, if applicable, will list the current value recorded in a log page. |
| Threshold | This column, if applicable, will list the maximum threshold value set by the user or the default threshold value set by the system. |

CREATE CSV FILE

Create Csv File

This option allows the user to save the values as a *.csv (Comma Separated Value) file.

CLEAR SMART ALERTS

Clear Smart Alerts

This option will clear the alerts flagged by the firmware; however, the firmware will continue to flag (an alert will appear in **red text** in the SMART panel) an alert condition if it is still active. For example, if there is a temperature alert, the Clear Smart Alerts option will clear the SMART alert, but if the underlying cause is not addressed within a few minutes, the firmware will raise the alert again due to an active alert condition.

SMART PANEL-SATA DATA

Figure 6 shows the SMART panel listing all the Attribute IDs supported by a SATA device.

| Info | | SMART | Statistics | Diagnostics | | |
|------|-------------------------------|--------|------------|-------------|-----------|--|
| Attr | Description | Status | Value | Threshold | Raw Value | |
| 0x01 | Raw Read Error Rate | OK | 100 | 25 | 0 | |
| 0x02 | Throughput Performance | OK | 100 | 25 | 100 | |
| 0x05 | Reallocated Block Count | OK | 100 | 10 | 0 | |
| 0x09 | Power On Hours | N/A | 93 | 0 | 4,942 | |
| 0x0c | Power Cycle Count | N/A | 100 | 0 | 115 | |
| 0x0d | Soft Read Error Rate | N/A | 100 | 0 | 0 | |
| 0x64 | Erase Count | N/A | 99 | 0 | 1,327,168 | |
| 0x67 | Recovery Event Count | N/A | 100 | 0 | 0 | |
| 0xb1 | Wear Leveling Count | N/A | 99 | 0 | 50 | |
| 0xb2 | Unexpected Power Loss | N/A | 100 | 0 | 102 | |
| 0xb4 | Reserved Block Count | N/A | 100 | 10 | 71,262 | |
| 0xb5 | Program Fail Count | N/A | 100 | 0 | 0 | |
| 0xb6 | Erase Fail Count | N/A | 100 | 0 | 0 | |
| 0xb7 | Runtime Bad Block | N/A | 100 | 0 | 0 | |
| 0xb8 | End-to-end Error Detection | N/A | 100 | 90 | 0 | |
| 0xbb | Reported Uncorrectable Errors | N/A | 100 | 0 | 0 | |
| 0xbc | Command Timeout | N/A | 100 | 0 | 0 | |
| 0xc2 | Current Temperature | N/A | 35 | 0 | 35 | |
| 0xc3 | Current Error Count | N/A | 100 | 0 | 0 | |

Figure 6: SMART Panel-SATA Data

SMART LISTING-SATA DATA

There are six columns in the listing: **Attr (Attribute)**, **Description**, **Status**, **Value**, **Threshold** and **Raw Value**. Table 6 describes each column found in the SMART panel.

Table 6: SMART Panel Listing-SATA Data

| LABEL | DESCRIPTION |
|-------------|---|
| Attr | The Attr (Attribute) column lists the Attribute IDs. |
| Description | The names of the supported attributes. |
| Status | The current attribute status as reported by the drive. |
| Value | The the current value recorded for the attribute. |
| Threshold | The threshold value set by the user or the default threshold value set by the system. |
| Raw Value | The raw value is the numeric raw data in little endian format. |

STATISTICS PANEL

The **Statistics** panel will list the performance statistical counter data associated with the selected device as maintained by the various log pages.

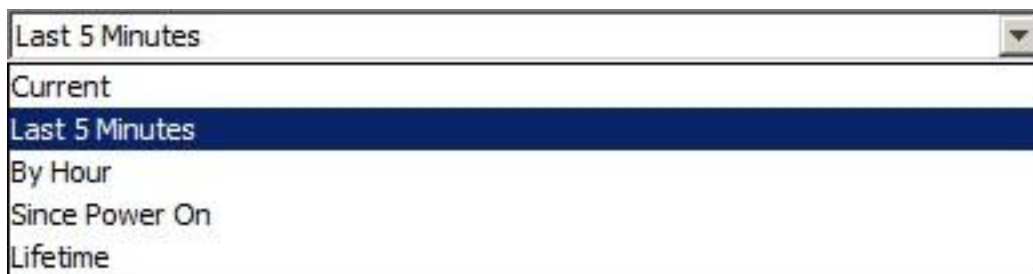


The screenshot shows the 'Statistics' tab in a software interface. At the top, there are tabs for 'Info', 'SMART', 'Statistics', and 'Diagnostics'. Below the tabs, a dropdown menu is set to 'Lifetime'. A table displays various performance metrics and their values. At the bottom right of the table area, there are 'Refresh' and 'Clear' buttons.

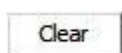
| Property Name | Property Value |
|------------------------|----------------|
| Read Commands | 628 |
| Read Command Hits | 628 |
| Read Blocks | 1,811 |
| Read Block Hits | 1,811 |
| Read Stalled | 0 |
| Write Commands | 0 |
| Write Blocks | 0 |
| Write Stalled | 0 |
| Write Odd Start | 0 |
| Write Odd End | 0 |
| Erase Commands | 1505 |
| Nand Read Commands | 0 |
| Nand Read Blocks | 0 |
| Nand Write Commands | 0 |
| Nand Write Blocks | 0 |
| Nand Read before Write | 0 |

Figure 7: The Statistics Panel

The user can view a specific statistical set by selecting an option from the **Show me statistics based on** drop-down list. The options are **Current** (current statistical set), **Last 5 Minutes** (statistics gathered in the last five-minute period), **By Hour** (the statistics as recorded over the last 60 minutes), **Since Power On** (the statistics recorded since the last power-on cycle) or **Lifetime** (the statistics recorded over the lifetime of the device).



Click the **Refresh** button to refresh the values for the performance statistics.



Click the **Clear** button to reset the statistical values and to begin a recording a new set of statistics.

DIAGNOSTICS PANEL

The options in the **Diagnostics** panel allow the user to diagnose and troubleshoot advanced technical issues, generate field data for technical analysis, and to reset the factory defaults.

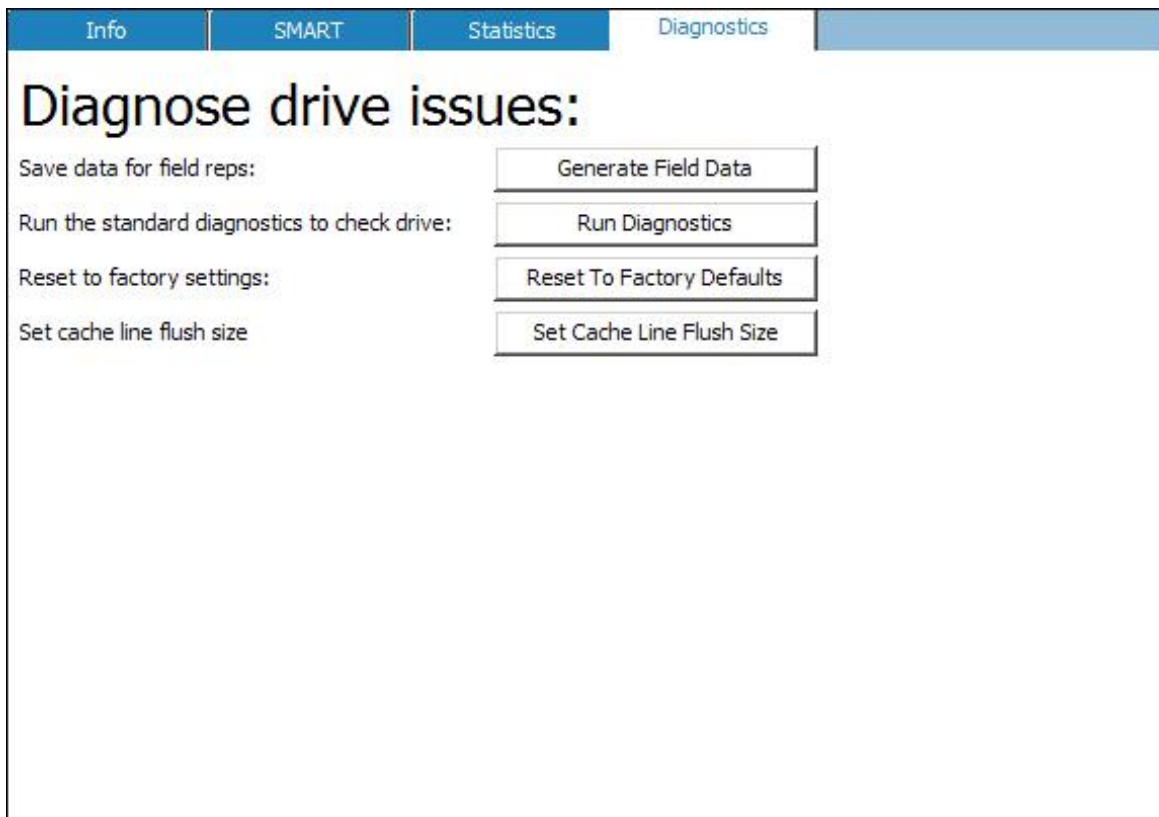


Figure 8: The Diagnostics Panel

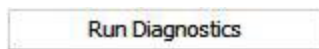
DIAGNOSTICS PANEL OPTIONS

GENERATE FIELD DATA



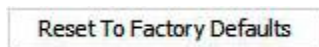
Click the **Generate Field Data** button to generate a report listing all the current field values stored on the drive.

RUN DIAGNOSTICS



Click the **Run Diagnostics** button to run the on-board drive diagnostic system.

RESET TO FACTORY DEFAULTS



Click the **Reset To Factory Defaults** button to overwrite any user settings with the factory default settings.

SET CACHE LINE FLUSH SIZE



Click the **Set Cache Line Flush Size** button to set the granularity value for the flushing of data currently in the write cache to the media.

OVERVIEW

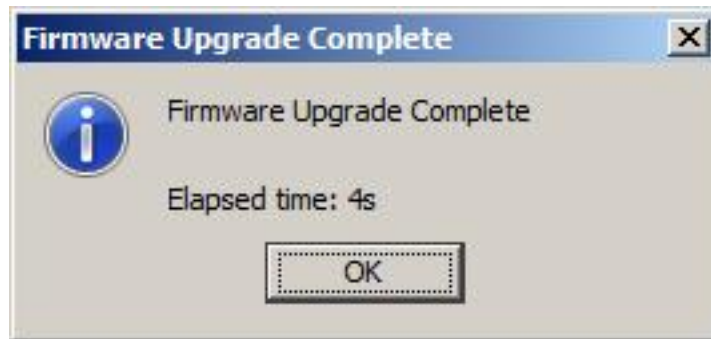
This section describes each function of the SDMGUI toolbar and a procedure for accomplishing a specific administrative task.



FIRMWARE UPDATES

To update the firmware:

1. Click the **Firmware Update** button. The Open dialog box will appear.
2. Navigate to and select the firmware file.
3. Click **Open**. You are prompted to confirm. Click **Yes** to update the firmware or click **No** to cancel.
4. If you click **Yes**, the firmware undergoes the update process. The Firmware Upgrade complete dialog box appears when the update is complete.

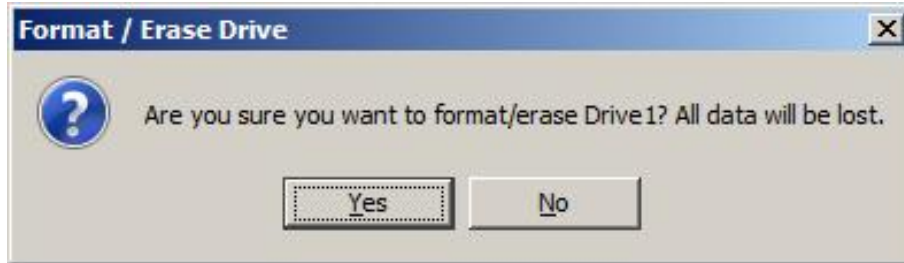


5. Click **OK** to close the dialog box.

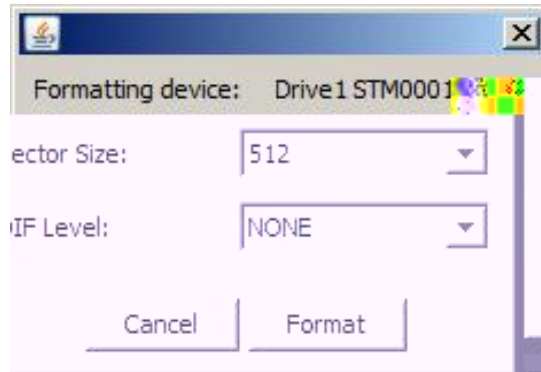
FORMATTING A DRIVE

To format/erase the drive:

1. Click the **Format/Erase** button. The Format/Erase dialog box appears. You are prompted to confirm.
2. Click **Yes** to begin or **No** to cancel. If you click **Yes**, a confirmation dialog box appears.



3. Click **Yes**. The Sector Size and DIF Level dialog box appears.

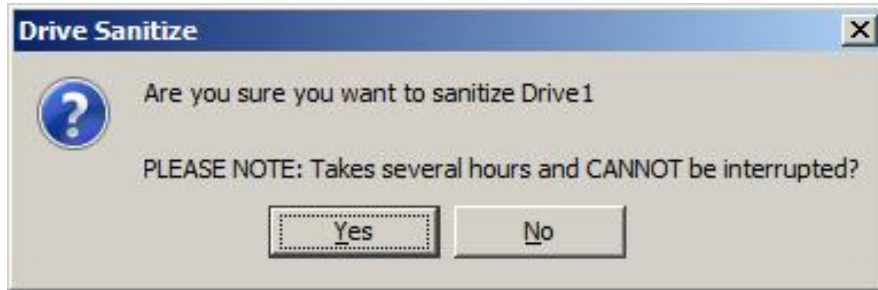


4. Select a sector size from the **Sector Size** drop-down list. The default is **512**-byte sector sizes, but you can also select **520**-, **524**-, or **528**-byte sector sizes.

SANITIZING A DRIVE

To sanitize the drive:

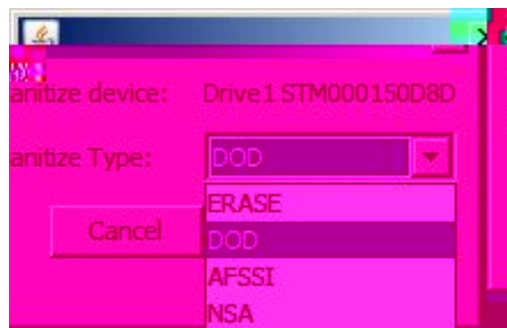
1. Click the **Sanitize** button. You are prompted to confirm.



2. Click **Yes** to continue or **No** to cancel. If you click **Yes**, the Sanitize Type dialog box appears.



3. Select a **Sanitize Type** from the drop-down list. You may choose a normal **ERASE**, or a **DOD**, **AFSSI** or **NSA** sanitization standard.



4. Click **Sanitize**. The drive is sanitized according to the selected sanitization standard. Note that the drive goes off-line and the **Status** (Information tab) is **6 D Q L W L**. When the process is complete, the drive comes on-line and the **Status** updates to **Online**.

SDMCMD COMMAND LINE INTERFACE

OVERVIEW

SDM also supports a Command Line Interface (CLI). This section discusses the usage and

CLEARSMARTALERTS

ClearSmartAlerts will clear all SCSI SMART alerts flagged by the firmware; however the firmware will continue to flag an alert condition if it still active. For example, if there is a temperature alert, ClearSmartAlerts will clear the SMART alert, but if the underlying issue has not been resolved, the firmware will raise the alert again due to an active alert condition.

Synopsis

```
sdmcmd ClearSmartAlerts target=<devicereference>
```

Example

```
sdmcmd clearsmartalerts target=gen4sas:drive2
```

Table 11: ClearSmartAlerts Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |

Output

If the command is successful, the output will be:

```
Results for ClearSmartAlerts
operationresult = Success
```

If the command fails, the output will be:

```
Results for ClearSmartAlerts
operationresult = FailedUnsupportedOption
```

FIRMWAREUPGRADE

FirmwareUpgrade will perform a partial or full update of the firmware on the target device.

Synopsis

```
sdmcmd FirmwareUpgrade <parameter>=<value>
```

Example

```
sdmcmd firmwareupgrade target=gen4sas:drive0 firmwareimage=sas440R_1024NB16C8LB-291E firmwareimagecount=1000000
```

Table 12: FirmwareUpgrade Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |
| firmwareImage=<byteptr> | Mandatory | Windows, Linux | The bits to send to the drive. |
| firmwareImageCount=<int> | Mandatory | Windows, Linux | The number of bytes, expressed as an <i>integer</i> , in the firmware image. |

Output

operationresult=<OperationResult> Overall outcome of the FirmwareUpgrade operation.

FORMAT

Format will format or erase all user data on the target device.

Synopsis

```
sdmcmd Format <parameter>=<value>
```

Example

```
sdmcmd format target=gen4sas:drive0 sectorsize=512 diflevel=type1
```

Table 13: Format Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |
| sectorsize=<int> | Mandatory | Windows, Linux | The sector size in bytes, expressed as an <i>integer</i> . |
| diflevel=<diflevel> | Mandatory | Windows, Linux | The current integrity level. <i>None</i> = No extra integrity information for each sector; <i>Type1</i> = DIF Level 1; <i>Type3</i> = DIF Level 3. |

Output

operationresult=<OperationResult> Overall outcome of the Format operation.

GENERATECLEARPRIVILEGEFILE

This command will generate the **sdmpriv.cdat** (clear-text data) file for all sTec drives detected by the system. The user should only use this command under the direction of an authorized sTec representative.

Synopsis

```
sdmcmd GenerateClearPrivilegeFile
```

Example

```
sdmcmd generatclearprivilegefile
```

Output

SDMCMD will generate the **sdmpriv.cdat** file in the root directory.

GETDEFAULTPATH

GetDefaultPath will retrieve the current default path of *sdmlogfile.txt*. There are no input parameters for the command. The output consists of a string describing the default path where *sdmlogfile.txt* is stored.

Synopsis

```
sdmcmd GetDefaultPath
```

Example

```
sdmcmd getdefaultpath
```

Output

| | |
|-----------------------------------|--|
| operationResult=<OperationResult> | Overall outcome of the GetDefaultPath operation. |
| path=<string> | The default path name. |

GETDEVICECAPABILITIES

GetDeviceCapabilities will obtain the interface-specific capabilities for the target device.

Synopsis

```
sdmcmd GetDeviceCapabilites <parameter>=<value>
```

Example

```
Sdmcmd getdevicecapabilities target=gen4sas:drive1
```

Table 14: GetDeviceCapabilities Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |

Output

| | |
|-------------------------------------|---|
| operationResult=<OperationResult> | Overall outcome of the GetDeviceCapabilities operation. |
| drivePrivilege=<Privilege> | The privileges granted for the device. |
| capaGetInfo=<Capability> | Capability for GetInfo operation. |
| capaGetState=<Capability> | Capability for GetState operation. |
| capaFirmwareUpgrade=<Capability> | Capability for FirmwareUpgrade operation. |
| capaFormat=<Capability> | Capability for Format operation. |
| capaSanitize=<Capability> | Capability for Sanitize operation. |
| capaGetStatistics=<Capability> | Capability for GetStatistics operation. |
| capaCaptureFieldData=<Capability> | Capability for CaptureFieldData operation. |
| capaRunDiagnostic=<Capability> | Capability for RunDiagnostic operation. |
| capaSetFactoryDefaults=<Capability> | Capability for SetFactoryDefaults operation. |
| capaSetSmartThresholds=<Capability> | Capability for SetSmartThresholds operation. |
| capaResize=<Capability> | Capability for Resize operation. |
| capaGetLog=<Capability> | Capability for GetLog operation. |
| capaGetDefects=<Capability> | Capability for GetDefects operation. |
| capaStartTrace=<Capability> | Capability for StartTrace operation. |
| capaFinishTrace=<Capability> | Capability for FinishTrace operation. |
| capaWriteConfig=<Capability> | Capability for WriteConfig operation. |
| capaSetSerial=<Capability> | Capability for SetSerial operation. |

| | |
|--|---|
| capaSetWwn=<Capability> | Capability for SetWwn operation. |
| capaSetModel=<Capability> | Capability for SetModel operation. |
| capaGetDriveSize=<Capability> | Capability for GetDriveSize operation. |
| capaGetDrivePrivilege=<Capability> | Capability for GetDrivePrivilege operation. |
| capaGetDeviceCapabilities=<Capability> | Capability for GetDeviceCapabilities operation. |

GETDRIVEPRIVILEGE

GetDrivePrivilege will retrieve the privilege level for the target device.

Synopsis

```
sdmcmd GetDrivePrivilege <parameter>=<value>
```

Example

```
sdmcmd getdriveprivilege target=gen4sas:drive0
```

Table 15: GetDrivePrivilege Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |

Output

operationResult=<OperationResult> Overall outcome of the GetDrivePrivilege operation.

drivePrivilege=<Privilege> Privilege granted to the target device.

GETINFO

GetInfo retrieves the current information associated with the target device.

Synopsis

```
sdmcmd GetInfo <parameter>=<value>
```

Examples

```
sdmcmd getinfo target=gen4sas:drive0
```

```
sdmcmd getinfo target=mach16:drive1
```

```
sdmcmd getinfo target=mach16sasatt:drive2
```

```
sdmcmd getinfo target=gen4pcie:drive3
```

Table 16: GetInfo Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |

Output

operationresult=<OperationResult>

Overall outcome of the GetInfo operation.

modelName=<string>

The model name of the device.

firmwareVersion=<string>

The firmware version of the device.

capacityInSectors=<int>

The current usable capacity expressed as an *integer*.

sectorSize=<int>

The sector size expressed as an *integer* in bytes.

physicalPath=<string>

The device node name on the host.

RUNDIAGNOSTIC

RunDiagnostic will invoke the on-board diagnostic functions of the target device.

Synopsis

```
sdmcmd RunDiagnostic <parameter>=<value>
```

Example

```
sdmcmd rundiagnostic target=gen4sas:drive0 diagnostictype=type3
```

Table 22: RunDiagnostic Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|----------------------------------|-----------|----------------|---|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |
| diagnosticType=<Diagnostic Type> | Mandatory | Windows, Linux | Diagnostic type or level. <i>Type1</i> = Type 1 diagnostic; <i>Type2</i> = Type 2 diagnostic; <i>Type3</i> = Type 3 diagnostic. |

Output

operationResult=<OperationResult> Overall outcome of the RunDiagnostic operation.

SANITIZE

Sanitize is a vendor-specific command used to invoke a user-specified sanitization standard. The user can perform a normal erase, or erase/fill to DOD 5220.22-M, AFSSI-5020, or NSA 130-2 standards.

Synopsis

```
sdmcmd Sanitize <parameter>=<value>
```

Example

```
sdmcmd sanitize target=gen4sas:drive0 sanitizetype=dod
```

Table 23: Sanitize Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|------------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |
| sanitizeType=<Sanitize Type> | Mandatory | Windows, Linux | The Sanitization standard or level used to erase the drive. <i>Erase</i> = Erase only; <i>Dod</i> = DOD Standard 5220.22-M; <i>Afssi</i> = AFSSI-5020 Standard; <i>Nsa</i> = NSA 130-2 Standard. |

Output

operationResult=<OperationResult> Overall outcome of the Sanitize operation.

SCANLOCAL

ScanLocal will scan and detect storage devices installed in the local host. There are no input parameters for the command. The output consists of list of storage devices installed in the local system.

Synopsis

```
sdmcmd ScanLocal
```

Example

```
sdmcmd scanlocal
```

Output

operationResult=<OperationResult> Overall outcome of ScanLocal operation.

'HYLFHV 'HYLFH5HIHUF List of sTec and other storage devices installed in host.

Where the typical output would list the results and any detected devices:

Results for ScanLocal

```
operationResult = Success
devices.count = 3
  devices[0] = other:Drive0
  devices[1] = gen3sas:Drive1
  devices[2] = gen4sas:Drive2
```

SETCACHELINEFLUSHSIZE

SetCacheLineFlushSize will set the granularity value for the flushing of data currently in the write cache to the media. The command has two input parameters: *target=<devicereference>* and *cacheLineFlushSize*. The valid values for *cacheLineFlushSize* are 2, 4, 8, 16 and 32. There is one output parameter, *resultantCacheLineFlushSize*, which is the new size that results from the command execution. The parameter is used to change Byte 5³ 0 D [L P X P & R P P D Q G V 3 H U & K S D Q I M b d e Page 0] 20 X T h e ' command is only valid for sTec Gen4 SAS and Gen4 PCIe drives; it is not implemented for Gen4 FC or MACH16 SSDs.

Notes:

1. If a non-supported drive is specified, SDM will return an error of UNSUPPORTED OPERATION.
2. The command is only valid for drives configured with 512-byte sector sizes due to firmware limitations. If the sector size of the drive is not equal to 512 bytes, and the *cacheLineFlushSize* is valid, the command will be accepted and the MODE SENSE command will show the new value, but the firmware will not execute it. In this event, SDM will report a successful operation, but the log file will contain a message that the value will not be processed by the firmware.
3. If SetCacheLineFlushSize is called with the value of 0 (zero), the current value of the *cacheLineFlushSize* is returned, but no update will occur.

Synopsis

```
sdmcmd SetCacheLineFlushSize target=<devicereference> cachelineflushsize=x.
```

Example

```
sdmcmd setcachelineflushsize target=gen4pcie:drive0 cachelineflushsize=8
```

Table 24: SetCacheLineFlushSize Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |
| cachelineflushsize=x | Mandatory | Windows, Linux | Where <i>x</i> is the granularity value. The valid values are 2, 4, 8, 16 and 32. |

Output

If the command is successful, the output will be:

```
Results for SetCacheLineFlushSize
      operationResult = Success
      resultantCacheLineFlushSize = 8 0x8
```

If the command fails, the output will be:

```
Results for SetCacheLineFlushSize
      operationResult = FailedBadRequest
      resultantCacheLineFlushSize = 8 0x8
```

SETFACTORYDEFAULTS

SetFactoryDefaults will overwrite any user-defined settings with factory default settings.

Synopsis

```
sdmcmd SetFactoryDefaults <parameter>=<value>
```

Example

```
sdmcmd setfactorydefaults target=gen4sas:drive0
```

Table 25: SetFactoryDefaults Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|--------------------------|-----------|----------------|--|
| target=<devicereference> | Mandatory | Windows, Linux | The drive or device to access. For example, <i>gen4sas:drive0</i> or <i>/dev/sg0</i> . |

Output

operationResult=<OperationResult> Overall outcome of the SetFactoryDefaults operation.

SETPRIVPATH

SetPrivPath will specify the path to the preferred privilege file rather than the default path.

Synopsis

```
sdmcmd SetPrivPath path=<string>
```

Example

```
sdmcmd setprivpath path=pathname
```

Table 26: SetPrivPath Input Parameters

| PARAMETER | USAGE | PLATFORMS | DESCRIPTION |
|---------------|-----------|----------------|---|
| path=<string> | Mandatory | Windows, Linux | The path to the preferred privilege file. |

Output

operationResult=<OperationResult> Overall outcome of the SetPrivPath operation.

GLOSSARY

Table 27: Glossary of Terms

| TERM | DEFINITION |
|------------------|---|
| CGI | Common Gateway Interface. |
| CLI | Command Line Interface. |
| EULA | End-User License Agreement. |
| FAE | Field Application Engineer. |
| Fibre Channel | This term refers to devices that use the Fibre Channel-Arbitrated Loop (FC-AL) interface. It is a networking technology and protocol primarily used for storage networking. |
| Firmware | Firmware is a term often used to denote the embedded software programs and/or data structures used to internally control electronic devices, such as microcontrollers or microprocessors. |
| FW | See <i>Firmware</i> . |
| GNU | \$ U H F X U V L Y H D * F I B R Q Y R R W R B Q L [' |
| GPL | GNU Public License. |
| GUI | Graphical User Interface. |
| HBA | Host Bus Adapter |
| HDD | Hard Disk Drive. |
| IO or I/O | Input/Output. A READ or WRITE operation of user data. |
| IOPS | Input/Output Per Second, usually measured in 4,096 byte sizes. |
| iSCSI | Internet Small Computer System Interface. A protocol that allows for the transmission of SCSI commands and data transfers over IP networks, especially SANs (Storage Area Networks). |
| JVM | Java Virtual Machine. JVM is a component of the Java Framework Installation that runs Java code on a particular host. |
| NAS | Network Attached Storage. |
| Operating System | An Operating System (OS), also known as system software, manages all interaction and services between the user, applications, and system resources (hardware). |
| OS | See <i>Operating System</i> . |

| TERM | DEFINITION |
|----------------------|---|
| PCIe | PCI Express, or Peripheral Component Interconnect Express, is a computer expansion card standard. The term refers to add-in devices that use the PCIe serial interface. |
| SAN | Storage Area Network. |
| SCSI | Small Computer System Interface. |
| Serial-Attached SCSI | This term refers to devices that use the Serial-Attached SCSI, or SAS interface. |
| SSA | Solid-State Accelerator. |
| SSD | Solid-State Drive or Solid-State Device. |

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CUSTOMER SUPPORT

sTec, Inc. offers technical support for all SDM customers. You can email sTec, Inc. for answers to simple questions and to submit bug reports. You also have the option of accessing the support web page or contacting sTec, Inc. by telephone. Please provide a detailed description of the issue and include your contact information.

| ONLINE SUPPORT | TELEPHONE SUPPORT |
|---|---|
| 24 HOURS/7 DAYS World Wide Web: http://support.stec-inc.com Email: support@stec-inc.com (Available through the Support Portal after product registration.) | 8:00 A.M. ±5:00 P.M. PACIFIC STANDARD TIME (PST) International: 1-949-476-1180 Toll Free: 1-800-367-7330, Ext. 8899 |

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