User's Guide

ADATA® SSD
TOOLBOX

(Version 2.0)

Revision History

Date	Revision	Description
1/28/2014	1.0	Initial release
2/1/2021	2.0	UI redesign

Contents

Product Overview

Introduction

ADATA SSD Toolbox is a user-friendly GUI to obtain disk information and change disk settings. Additionally, it can speed up your SSD and even improve the endurance of ADATA SSD.

Notice

- **ADATA Toolbox is only for use with ADATA SSD products.**
- **Please back up your data before updating firmware or erasing the SSD.**
- **Press the refresh icon  when any changes have been made to the SSD.**
- **Some situations may result in the drive becoming un-detected. For example, when "Hot-Plug" is disabled in the BIOS setup.**
- **Some functions will not be supported if the drive is not an ADATA product.**

System Requirements

- **Supported operating systems include Windows 7 32 / 64-bit, Windows 8 32 / 64-bit, Windows 8.1 32 / 64-bit.**
- **Minimum 10MB of free capacity is required to run this program.**
- **The software supports all current ADATA SSDs. Some functions of the software may be limited on specific models. For a complete list of supported devices, refer to http://www.adata-group.com/index.php?action=ss_main&page=ss_software_6&lan=en**

Software Limitations

- **Supports physical drive interface only.**
- **Security Erase function only supported in Microsoft Windows® 7 OS.**

Starting SSD Toolbox

You can download ADATA SSD Toolbox from http://www.adata- Unzip the file and double-click "SSDTool.exe" to start.

ADATA Toolbox Functions

All functions are categorized into five sub-screens, including Drive Information, Diagnostic Scan, Utilities, System Optimization, and System Information. When you run ADATA SSD Toolbox, the main screen will automatically display drive information screen.

Drive Information Screen

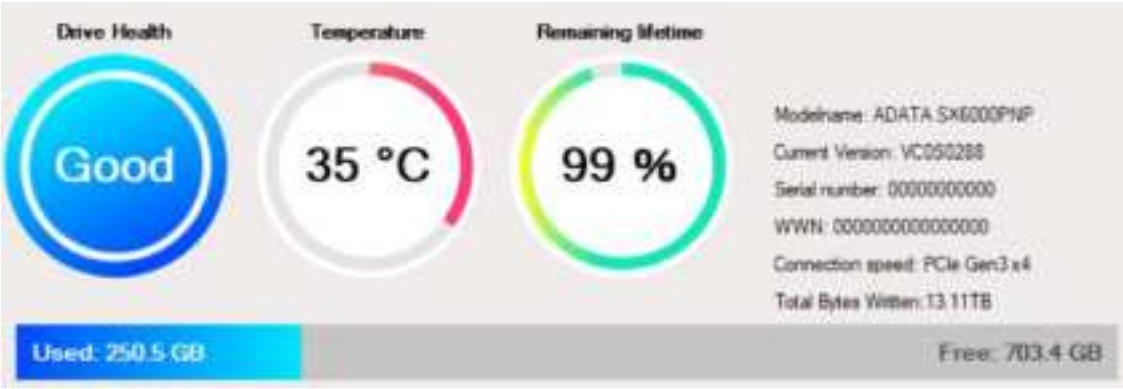
In this screen, you can see detailed information on the selected drive.

1. Select a Drive

Simply choose any SSD on the drop-down list, a drive dashboard will appear accordingly. You may also navigate dashboards of all installed drives with the scroll bar on the right. Get the latest drive status by clicking the refresh icon after an SSD has been plugged in / unplugged.

2. Drive Dashboard

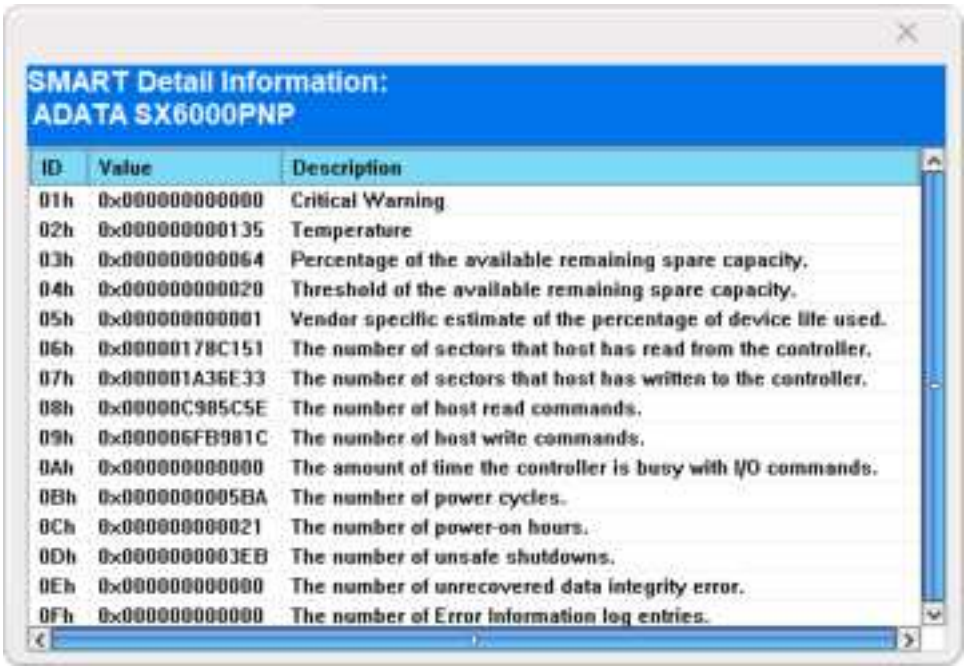
Drive dashboard displays the information including drive health, temperature, remaining lifetime, capacity, model name, firmware version, serial number, WWN*, Interface speed, and TBW*. (Some modules may not support Total Bytes Written function)



*WWN:World Wide Name
*TBW :Total Bytes Written

3. S.M.A.R.T. Button

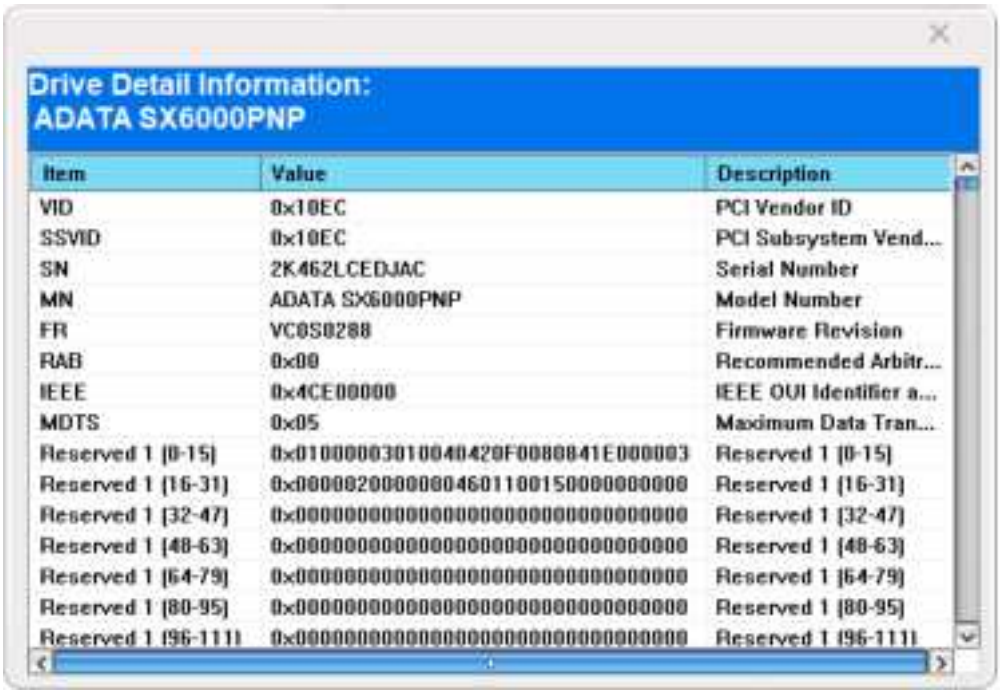
Click SMART Details button to reveal S.M.A.R.T. table, which shows Self-Monitoring, Analysis and Reporting Technology attributes on the selected drive. Different brands of SSD may not support all S.M.A.R.T. attributes. For more attributes, refer to the SSD controller specification or link to S.M.A.R.T. attributes at the end of this guide (1).



4. Drive Details Button

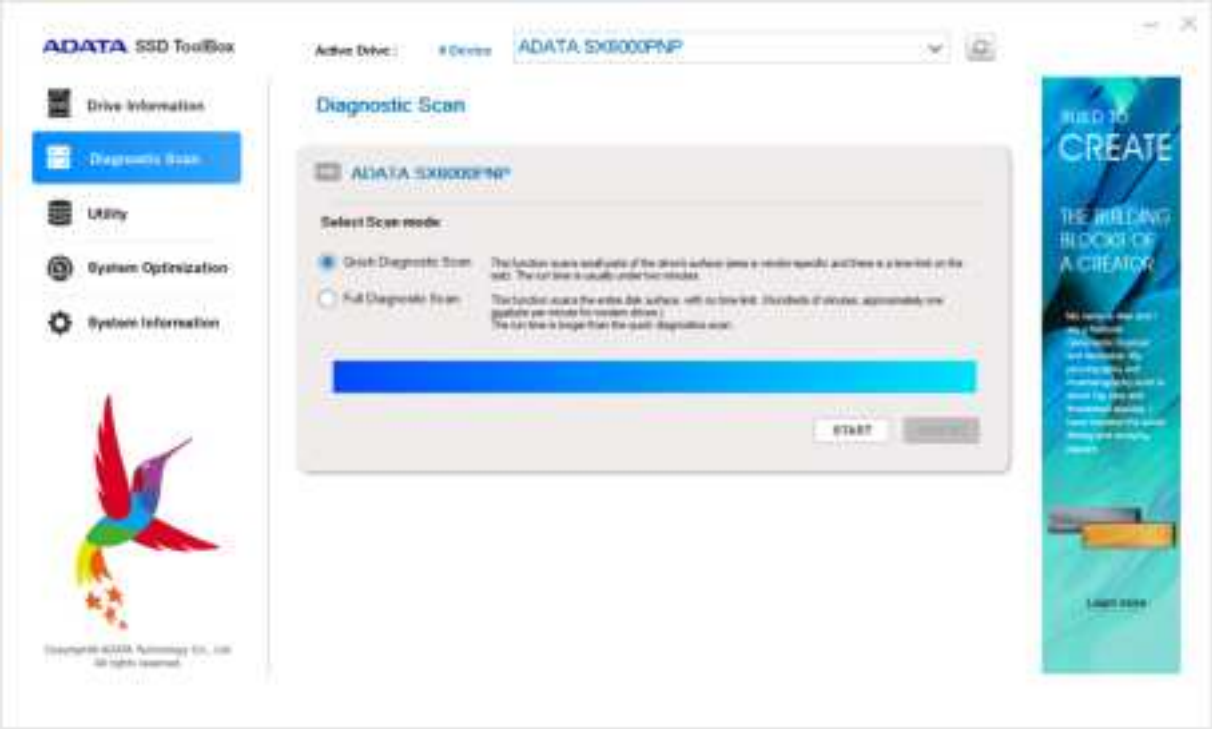
Drive Details

Click Drive Details button to check in-depth technical information about the drive. Other values will be displayed when using other ADATA products. For detailed information on the terms used, refer to the ATA specification linked at the end of this guide. (2)



Diagnostic Scan

There are two diagnostic scan options available.

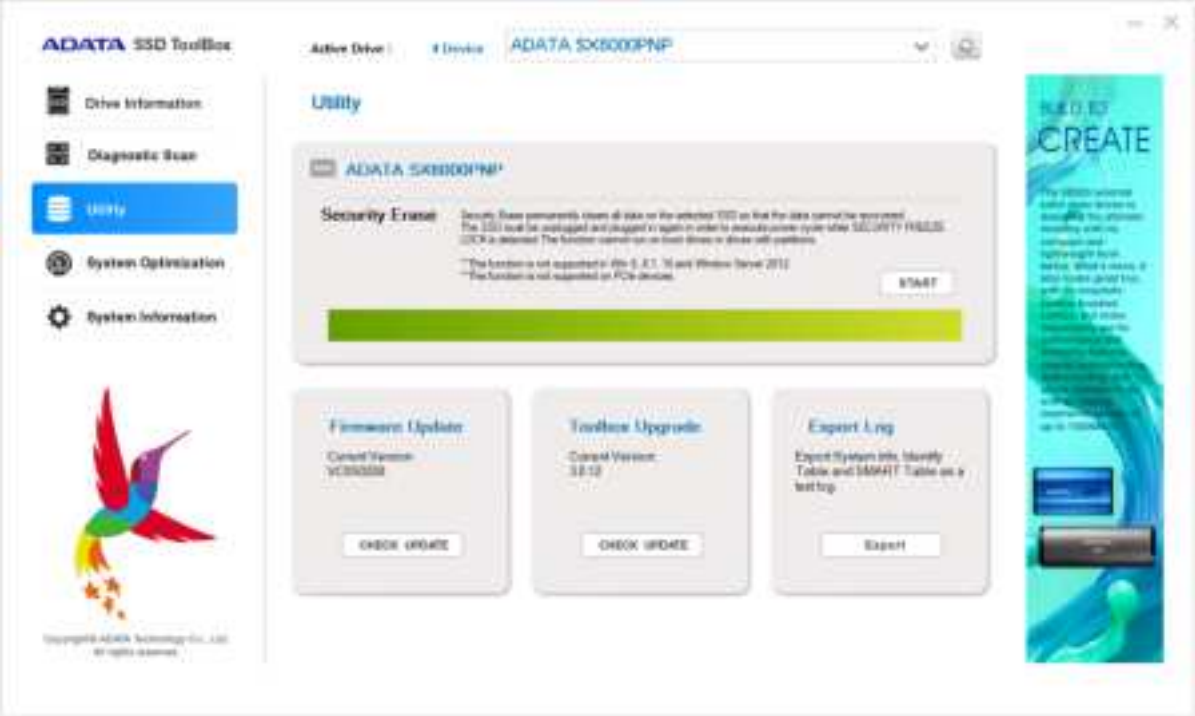


Quick Diagnostics – This option will run basic test on free space of the selected drive. It may take several minutes.

Full Diagnostics – This option will run a read test on all used space of the selected drive, and run a write test on all free space of selected drive.

Utilities

There are multiple services on the Utilities screen, include Security Erase, FW update, Toolbox Upgrade and Export Log.



1. Security Erase

- Please remove all of partitions before running **Security Erase.**
- Do not disconnect the SSD while security erase is running. Doing so will result in the SSD becoming security locked.
- This action will delete all data on the drive, and restore the drive to its factory default.

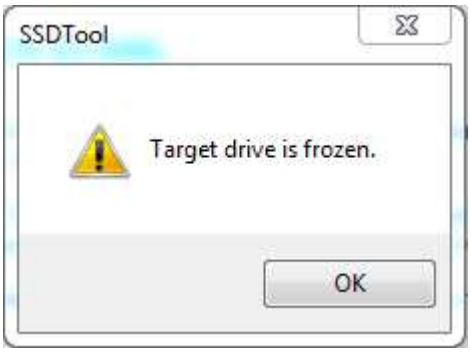
- Running **Security Erase** will reduce the lifespan of the drive. Use this function only when necessary.

Identify the Security Erase Status of an ADATA SSD

Use the steps below to check the security erase status of an ADATA SSD.

- Assign the SSD on the Disk Info screen
- Click Drive Details
- Scroll down to Security Erase (word 128)
- Identify Security Erase Status

What to do if the program displays a "Frozen" message while executing security erase



- For security reasons, some platforms will freeze a storage device under certain conditions. This prevents **Security Erase** from running. Hot-plugging the drive may solve this problem.

Unlocking Security Erase while ADATA SSD is Security locked

- Use a third-party tool to unlock
- Unlock Password: ADATA

2. FW Update

It will link to the corresponding download page for the SSD Firmware directly, allowing you to download the latest FW version.

3. Toolbox Upgrade

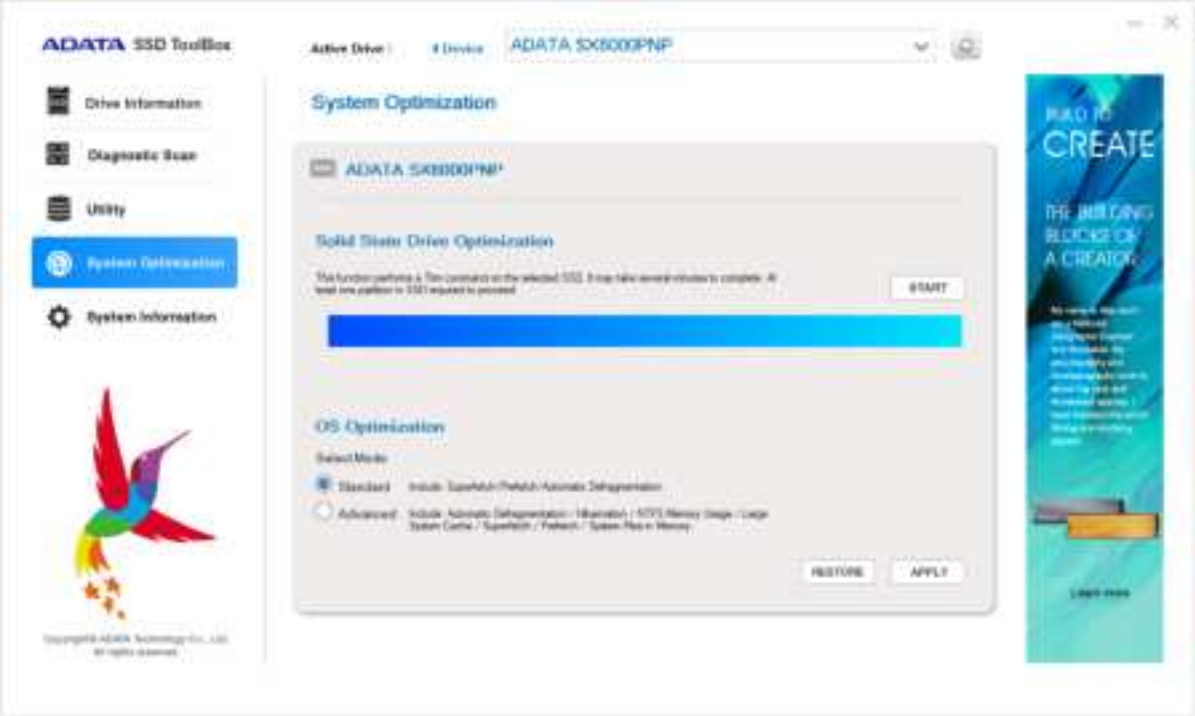
Click the CHECK UPDATE button to download the latest version of this software.

4. Export Log

Click the Export button to download **System Info**, **Identify Table** and **S.M.A.R.T. Table** as a text log.

System Optimization

There are two way to optimize the selected SSD： **SSD Optimization** and **OS Optimization**.



1. SSD Optimization

SSD Optimization provides Trim service on free space of selected drive.

*It is recommended to run SSD optimization once a week.

2. OS Optimization

Standard – Some settings will be changed for Basic OS Optimization, including Superfetch, Prefetch, and Automatic Defragmentation.

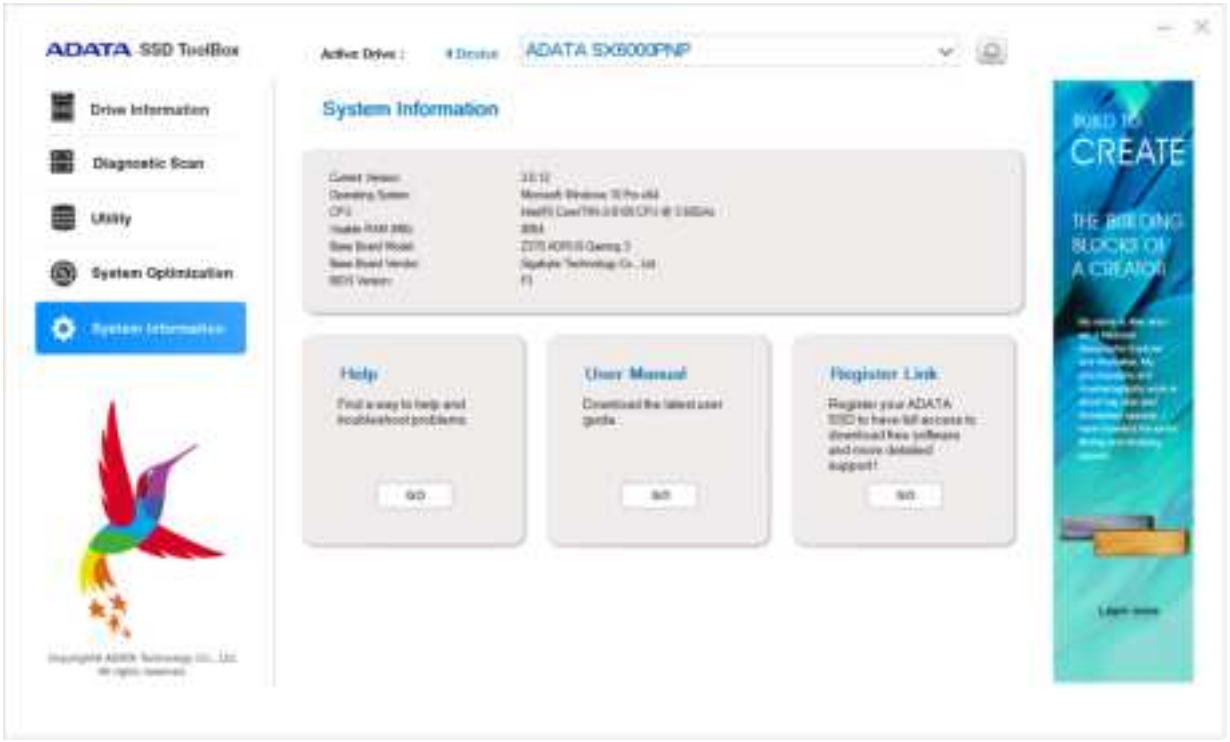
Advanced – Some settings will be changed for Advanced OS Optimization including Hibernation, NTFS Memory Usage, Large System Cache, Superfetch, Prefetch, and System File in Memory.

More detailed information can be seen below regarding OS

Optimization: (3)

System Info

Displays current system information, and also provides the links to seek official help, download user manual (SSD Toolbox), and register our SSD products.



Q&A

If there is some problem when using the toolbox, please visit the following website:

http://www.adata-group.com/index.php?action=ss_main&page=ss_content_faq&cat=Valuable+Software&lan=en

References

(1). **S.M.A.R.T.**
http://en.wikipedia.org/wiki/S.M.A.R.T.

ID	Attribute Name	ID	Attribute Name
01	**Read Error Rate** - Stores data related to the rate of hardware read errors that occurred when reading data from a disk surface.	0C	**Power Cycle Count** - This attribute indicates the count of full hard disk power on/off cycles.
02*	**Throughput Performance** - Overall (general) throughput performance of a hard disk drive. If the value of this attribute is decreasing there is a high probability that there is a problem with the disk.	A7*	Vendor Specific
03*	**Spin-Up Time** - Average time of spindle spin up (from zero RPM to fully operational [milliseconds]	A8*	Vendor Specific
05	**Reallocated Sectors Count** -When the hard drive finds a read/write/verification error, it marks that sector as "reallocated" and transfers data to a special reserved area (spare area).	A9*	Vendor Specific
07*	**Seek Error Rate** - (Vendor specific raw value.) Rate of seek errors of the magnetic heads..	AA*	Vendor Specific
08*	**Seek Time Performance** - Average performance of seek operations of the magnetic heads. If this attribute is decreasing, it is a sign of problems in the mechanical subsystem.	AB*	Program Fail Count -It shows total count of program fails. The normalized value, beginning at 100, shows the percent remaining of allowable program fails.
09	**Power-On Hours (POH)** - The raw value of this attribute shows total count of hours in power-on state.	AC*	Erase Fail Count -It shows total count of program fails. The normalized value, beginning at 100, shows the percent remaining of allowable program fails.

0A*	**Spin Retry Count** - Count of retry of spin start attempts.	AD*	Vendor Specific
AE*	Unexpected Power Loss Count - Counts the number of unexpected power loss events since the drive was deployed.	C5*	Current Pending Sector Count - Count of "unstable" sectors (waiting to be remapped, because of unrecoverable read errors).
AF*	Vendor Specific	C9*	Uncorrectable Soft Read Error Rate - Number of soft read errors that cannot be fixed on-the-fly and requires deep recovery via RAISE
B1*	Wear Range Delta - Returns the percent difference in wear between the most-worn block and least-worn block.	CC*	Soft ECC Correction Rate - Number of errors corrected by RAISE that cannot be fixed on-the-fly and requires RAISE to correct.
B5*	Program Fail Count - Total number of Flash program operation failures since the drive was deployed	E6*	Life Curve Status -A life curve used to help predict life in terms of the endurance based on the number of writes to flash
B6*	Erase Fail Count -Four bytes used to show the number of block erase failures since the drive was deployed	E7*	SSD Life Left -Indicates the approximate SSD life left, in terms of program/erase cycles or Flash blocks currently available for use
BB*	Reported Uncorrectable Errors -The count of errors that could not be recovered using hardware ECC	E9*	Vendor Specific
C0*	Unsafe Shutdown Count - Count of times the heads are loaded off the media. Heads can be unloaded without actually powering off.	EA*	Vendor Specific
C2	Temperature -Current internal temperature.	F0*	Vendor Specific
C3*	On-the-Fly ECC Uncorrectable Error Count -This attribute tracks the number of uncorrectable errors	F1*	Lifetime Writes from Host -Indicates the total amount of data written from hosts since the drive was deployed.

C4*	Reallocation Event Count -Count of remap operations. The raw value of this attribute shows	F2*	Lifetime Reads from Host - Indicates the total amount of data read to hosts since the
	the total count of attempts to transfer data from reallocated sectors to a spare area. Both successful & unsuccessful attempts are counted		drive was deployed.

Some S.M.A.R.T. attributes may differ for different drives. These are marked with an asterisk *.

(2). **ATA Command Set**
http://www.t13.org/Documents/UploadedDocuments/docs2013/d2 161r5-ATAATAPI_Command_Set_-_3.pdf

(3). **OS Optimization**

Superfetch	http://msdn.microsoft.com/en-us/library/ff794183(v=winembedded.60).aspx	
	Hkey_local_machine\SYSTEM\ CurrentControlSet \Control\Session Manager\Memory Management\PrefetchParameters\EnableSuperfet ch. Set to 0.	EnableSuperfetch is a setting in the File-Based Write Filter (FBWF) and Enhanced Write Filter with HORM (EWF) packages. It specifies how to run SuperFetch, a tool that can load application data into memory before it is demanded.
Prefetch	http://msdn.microsoft.com/en-us/library/ms940847(v=winembedded.5).aspx	
	Hkey_local_machine\SYSTEM\CurrentControlSet \Control\Session Manager\Memory Management\PrefetchParameters \EnablePrefetch . Set to 0.	Prefetch is a utility that is intended to improve Windows and application startup performance by loading application data into memory before it is demanded. When using EWF with a RAM overly to protect the boot volume, Prefetch is unable to persist its data from startup to startup.

Automatic Defragmentation	http://msdn.microsoft.com/en-us/library/bb521386(v=winembedded.51).aspx	
	HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Dfrg\BootOptimizeFunction\Background Disk Defragmentation Disable	Defragmentation is the process of moving portions of files around on a disk to defragment files, that is, the process of moving file clusters on a disk to make them contiguous
Hibernation	http://msdn.microsoft.com/en-us/library/ff794011(v=winembedded.60).aspx	
	HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Power\HibernateEnabled. Set to 0.	HibernateEnabled specifies whether the user of a device will be given the option of turning on or turning off hibernation.
NTFS Memory Usage	http://technet.microsoft.com/en-us/library/cc785435(WS.10).aspx	
	HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem\NtfsMemoryUsage. Set to 2.	NTFS increases the size of its lookaside lists and memory thresholds.
Large System Cache	http://msdn.microsoft.com/en-us/library/aa394239(v=vs.85).aspx	
	HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\SessionManager\MemoryManagement\LargeSystemCache. Set to 1.	Optimize memory for system performance.
System Files in Memory	http://technet.microsoft.com/en-us/library/cc959492.aspx	
	HKLM\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management. Set to 1.	Drivers and the kernel must remain in physical memory.