Samsung DC Toolkit 2.1

User Guide

Revision 1.0

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Revision History

Revision	Description	Date
1.0	Initial Release	October, 2018

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Preface

Samsung DC Toolkit is designed to help users with easy-to-use disk management and diagnostic features for server and data center usage. In addition to providing vital SSD status information, Samsung DC Toolkit will assist users in updating firmware, initializing drives, and etc.

This document is intended as a guide for how to use Samsung DC Toolkit under the server/data center environments. It provides a command line interface to interact with the Samsung SSD Drives.

This document describes how to use the Samsung DC Toolkit software.

Who should read this manual?

This manual is intended for Samsung DC Toolkit users. This manual assumes that the user is familiar with Windows operating systems.

What does this manual cover?

This manual contains the following chapters and appendix:

- Chapter 1, Preface
- Chapter 2, Abbreviations, gives the description of various abbreviations.
- Chapter 3, Introduction, describes Samsung DC Toolkit.
- Chapter 4, Command Line Options, describes the command line options for different features.
- Chapter 5, Examples, describes the features of the Samsung DC Toolkit

Cautions

1. Samsung DC Toolkit is only for Samsung SSD products and is not recommended for use with other products.
2. Samsung Electronics is not liable for any data loss or other damages that occur while using the software.
3. Samsung is not able to provide any data restoration service in the event of data loss.

For more information, please refer to Samsung DC Toolkit Agreement on End User License (EULA) at the end of this document.

Abbreviations

Mode	LED status
DCToolkit	DCToolkit_Vx.x.x commonly called DCToolkit
ATA	Advanced Technology Attachment
HDD	Hard Disk Drive
CLI	Command Line Interface
IO	Input Output
PATA	Parallel ATA
SATA	Serial ATA
SSD	Solid State Drive
S.M.A.R.T.	Self-Monitoring, Analysis, and Reporting Technology
NVMe	Non-Volatile Memory Express

Requirements and Warnings

Hardware Requirements

SSD

The following Samsung SSDs are supported

- Samsung SSD 860 DCT
- Samsung SSD 883 DCT
- Samsung SSD PM/SM863
- Samsung SSD PM853T
- Samsung SSD PM/SM863a
- Samsung SSD PM/SM883
- Samsung SSD 983 DCT/983 DCT M.2
- Samsung SSD PM/SM953
- Samsung SSD PM963
- Samsung SSD PM983
- Samsung SSD SZ983
- Samsung SSD SZ985.
- Samsung SSD 983 ZET

HBA, MegaRAID

System	OS	HBA/MR	Products	Controller
Dell R730xd	WS2012R2	MegaRAID Controller (6Gb/s)	LSI 9270-8i	SAS2208
		MegaRAID Controller (12Gb/s)	LSI 9361-8i	SAS3108
		Host Bus Adapter (6Gb/s)	LSI 9207-8i	SAS2308
		Host Bus Adapter (12Gb/s)	LSI 9300-8i	SAS3008
	WS2016	MegaRAID Controller (6Gb/s)	LSI 9270-8i	SAS2208
		MegaRAID Controller (12Gb/s)	LSI 9361-8i	SAS3108
		Host Bus Adapter (6Gb/s)	LSI 9207-8i	SAS2308
		Host Bus Adapter (12Gb/s)	LSI 9300-8i	SAS3008

NVMe Environment

Company	Model	Serial No.	CPU	RAM	BIOS	Front.P
Supermicro	119U-10 [X10DRU-i+]		1 : Intel Xeon CPU E5-2680 v3 @2.50GHz 2 : Intel Xeon CPU E5-2680 v3 @2.50GHz	16GB*4	2.0b (16.08.09)	NVMe 10
HP	DL360 Gen9	SGH552YP88	1 : Intel Xeon CPU E5-2650 v3 @2.30GHz 2 : -	16GB*4 (DDR4)	P89 v1.50 (15.07.20)	NVMe 2 SAS 8
Dell	PowerEdge R820	D7DF6Z1	1 : Intel Xeon CPU E5-4603 0 @2.00GHz 2 : Intel Xeon CPU E5-4603 0 @2.00GHz 3 : Intel Xeon CPU E5-4603 0 @2.00GHz 4 : Intel Xeon CPU E5-4603 0 @2.00GHz	4GB*4 (DDR4)	2.3.4	NVMe 4 SAS 8
Dell	T630	1XTNY42	1 : Intel Xeon CPU E5-2623 v3 @3.00GHz 2 : Intel Xeon CPU E5-2623 v3 @3.00GHz	44GB	2.4.2	NVMe 4 SAS 16
Quanta	D51BP-1U	-	0 : Intel Xeon CPU E5-2650 v3 @2.30GHz 1 : Intel Xeon CPU E5-2650 v3 @2.30GHz	16GB*1 (DDR4)	5.009 (15.01.29)	NVMe 10

Software Requirements

The tool is supported on the following environments.

OS	Comments
Windows Server 2012 R2	Limited support for some NVMe
Widows Server 2016 RS1 (Version 10.0.14393)	Limited support for some NVMe
RHEL 5.7 and later	Refer to the C600 chipset table below
RHEL 6.1 and later	Refer to the C600 chipset table below
CentOS	Follows the same limitations as RHEL above
Ubuntu 12.04 LTS and later	Full support

The table below lists the limited support for the Intel C600 chipset families due to the well-known ISCI (Intel SAS Driver) driver issue on Linux platform.

(https://github.com/Xilinx/linux-xlnx/commits/master/drivers/scsi/isci?page=1)

OS	Feature Support	Comments
RHEL 5.7 and later	Limited support for some ATA commands including Secure Erase, Set Max Address, and FW Update	
RHEL 6.1 and 6.2	Limited support for some ATA commands including Secure Erase, Set Max Address, and FW Update	
RHEL 6.3	Limited support for some ATA commands including Secure Erase, Set Max Address, and FW Update. But it can be fully supported when patched with ISCI 1.4 for RHEL 6.3 (refer to comments on the right)	http://sourceforge.net/projects/intel-sas/files/RHEL6.3%20Driver%20Update%20v1.4.1/
RHEL 6.4 and later	Full support	

* Support for C600 chipsets has been determined by evaluations and tests in the major part, and the ISCI driver code analysis. On Linux systems, the tool must run with root privileges. This can be done through either sudo or su commands. On Marvell controller, the features of Samsung SSD DC Toolkit may not work properly after hot plugging. Samsung SSD DC Toolkit must be run with administrator privilege.

Warning

1. SMART Self-Test(-S -e) doesn't work for SSDs when connected through the LSI MegaRAID cards because of MegaRAID time out issue.
2. SATA secure erase(-E) doesn't work for SSDs when connected through the LSI MegaRAID cards because of MegaRAID time out issue.
3. SMART Self-Test(-S -e) may not work for SSDs when connected through the LSI HBA cards because of HBA firmware issue.
4. SATA secure erase(-E) may not work for SSDs when connected through the LSI HBA cards because of HBA time out issue.
5. When going through ERRORMOD NF update, program hangs and cannot exit.
6. Do not detect device while self-test
7. When connecting a device to SAS9207-8i of Mega Raid, Analyze feature (-HM -A) of Health Monitoring does not work due to compatibility issue with HBA.
8. When connecting a device to SAS9300-8i of Mega Raid, Set temperature logging interval, Set/Get state of Cache Write feature(-X -ls, -X -xs, -X -xg) in SCT Commands seem to be not working as displayed on the console windows, however, the actual device status is set as it should be.
9. 860 DCT may enter Security Lock state if the user tries to detach during Erase.

Known Issue

1. Set Max Address and Secure Erase require a power cycle of SSD.
2. On Marvell controller, the DC Toolkit feature may not work properly after hot plugging.
3. The following operations are supported for SSDs when connected through the LSI HBA cards. Utilizing latest LSI HBA BIOS is recommended for proper operation:
4. : List, Firmware Update, Secure Erase, SMART, Set Max, Disk Information, Command History, and help features only.
5. The following operations are strongly recommended for RAID reconfiguration after sending command because of RAID information broken.
6. : Firmware Update, Secure Erase, Set Max
7. When executing SMART captive command, the test is finished, but the spin does not stop intermittently. In this case, users may confirm through ESC after expected test time.
8. When the SATA product is connected to 6G HBA and MegaRAID, HBA and MegaRAID ignore the command only for –V –plp(PLP Dump) option
9. When the SATA product is connected to 6G HBA and MegaRAID due to the compatibility issue between 6G HBA, MegaRAID and OS, --health-monitor(-HM) and --vendor-utility(-V) function usage may cause the termination(Crash) of the tool.
10. FW update feature used on OS disk may result in undefined behavior. So, OS reboot is strongly recommended immediately after FW update to OS disk.
11. -HM -E (extract) command only prints out the read reclaim count, but since this value is already included in the -A(analyze) command, -E command seems redundant. Thus, SM863a do not support -E command.
12. When logging temperature to specific file path, please type file path without quotation mark to get expected output.

13. The status of the Analyzer is shown as "true" in Device Info, though the result of –HM command is “Not supported”.
14. Random removal of disks after the system booting or refreshing would result in malfunctions of Device List Feature(-L).
15. 860 DCT does not support -S -q command (SMART query command).
16. 860 DCT does not support –E(Erase) command in Windows, PCH environments
17. -HM –A(analyze) command is only supported in Microsoft, AWS, General OEM products.

Features

This user guide describes the commands necessary to interact with Samsung SSD drives. The functionality includes:

OS	Comments
Device List	Detect list of attached Samsung SSD Drives in the system
Disk Details	Display the disk details (SATA supported)
Identify	Display Identify information
SMART	Display smart information and log temperature of the connected Samsung SSD drive, and estimate the lifetime of Samsung SSD
Secure Erase	Erase data on the SSD by issuing an ATA Format Unit (SATA supported)
Set Max	Set the maximum address of the Samsung SSD to change its user capacity (SATA supported)
SCT Command	Execute SCT command (SATA supported)
Firmware Update	Update the old firmware of the SSD to the new version (SATA supported)
Firmware Download	Updates firmware to specified NVMe disk (NVMe supported)
Firmware Commit	Commit the firmware image on specified NVMe disk (NVMe supported)
FA Log	Extract the log data from a core view block of the SSD
PLP	Enables the user to extract the PLP log data from a core view block of the SSD
DSLR	Extract DSLR data (SATA supported)
Option Rom Download	Download Option rom binary (NVMe supported)
SNOR	Extract dump from SNOR as PLP dump (NVMe supported)
On-demand Dump	Extract dump at the time the user requests (NVMe supported)
Health Monitor	Collect several information to monitoring device
Firmware Info Check	Display the firmware slot information (NVMe supported)
Disk Error Info Check	Display the Error Information (NVMe supported)
Disk Temp Check	Display the temperature of selected device (NVMe supported)
Disk Life Time Check	Display the remained life time of the selected device (%) (NVMe supported)
Help	Show detailed help

SATA Products

"Not Supported" in the below tables indicates the feature is not supported due to Operating System availability.

860 DCT

Feature		OS / Driver		
		Server 2012 R2 / Inbox Driver	Server 2016 RS1 / Inbox Driver	Linux
Device List		○	○	○
Disk Details		○	○	○
Identify		○	○	○
SMART		○	○	○
Secure Erase		○	○	○
Set Max		○	○	○
Firmware Update		○	○	○
Firmware Download		N/A	N/A	N/A
Firmware Commit		N/A	N/A	N/A
SCT Command		○	○	○
Format Namespace		N/A	N/A	N/A
Management Namespace		N/A	N/A	N/A
FA Log		N/A	N/A	N/A
PLP		N/A	N/A	N/A
DSLR		N/A	N/A	N/A
SNOR		N/A	N/A	N/A
On-demand Dump		N/A	N/A	N/A
Option Rom Download		N/A	N/A	N/A
Health Monitor	N/A	N/A	N/A	
	N/A	N/A	N/A	
Firmware Info Check		N/A	N/A	N/A
Disk Error Info		N/A	N/A	N/A
Disk Temp Check		N/A	N/A	N/A
Disk Life Time Check		N/A	N/A	N/A

PM/SM863, PM853T

Feature		OS / Driver		
		Server 2012 R2 / Inbox Driver	Server 2016 RS1 / Inbox Driver	Linux
Device List		○	○	○
Disk Details		○	○	○
Identify		○	○	○
SMART		○	○	○
Secure Erase		○	○	○
Set Max		○	○	○
Firmware Update		N/A	N/A	N/A
Firmware Download		N/A	N/A	N/A
Firmware Commit		○	○	○
SCT Command		N/A	N/A	N/A
Format Namespace		N/A	N/A	N/A
Management Namespace		○	○	○
FA Log		N/A	N/A	N/A
PLP		N/A	N/A	N/A
DSLR		N/A	N/A	N/A
SNOR		N/A	N/A	N/A
On-demand Dump		○	○	○
Option Rom Download		N/A	N/A	N/A
Health Monitor	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
Firmware Info Check		N/A	N/A	N/A
Disk Error Info		N/A	N/A	N/A
Disk Temp Check		N/A	N/A	N/A
Disk Life Time Check		N/A	N/A	N/A

PM/SM863a

Feature		OS / Driver		
		Server 2012 R2 / Inbox Driver	Server 2016 RS1 / Inbox Driver	Linux
Device List		○	○	○
Disk Details		○	○	○
Identify		○	○	○
SMART		○	○	○
Secure Erase		○	○	○
Set Max		○	○	○
Firmware Update		○	○	○
Firmware Download		N/A	N/A	N/A
Firmware Commit		N/A	N/A	N/A
SCT Command		○	○	○
Format Namespace		N/A	N/A	N/A
Management Namespace		N/A	N/A	N/A
FA Log		○	○	○
PLP		○	○	○
DSLR		○	○	○
SNOR		N/A	N/A	N/A
On-demand Dump		N/A	N/A	N/A
Option Rom Download		N/A	N/A	N/A
Health Monitor	N/A	○	○	○
	N/A	○	○	○
Firmware Info Check		N/A	N/A	N/A
Disk Error Info		N/A	N/A	N/A
Disk Temp Check		N/A	N/A	N/A
Disk Life Time Check		N/A	N/A	N/A

883DCT, PM/SM883

Feature		OS / Driver		
		Server 2012 R2 / Inbox Driver	Server 2016 RS1 / Inbox Driver	Linux
Device List		○	○	○
Disk Details		○	○	○
Identify		○	○	○
SMART		○	○	○
Secure Erase		○	○	○
Set Max		○	○	○
Firmware Update		N/A	N/A	N/A
Firmware Download		N/A	N/A	N/A
Firmware Commit		○	○	○
SCT Command		N/A	N/A	N/A
Format Namespace		N/A	N/A	N/A
Management Namespace		○	○	○
FA Log		N/A	N/A	N/A
PLP		N/A	N/A	N/A
DSLR		N/A	N/A	N/A
SNOR		N/A	N/A	N/A
On-demand Dump		○	○	○
Option Rom Download		N/A	N/A	N/A
Health Monitor	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A
Firmware Info Check		N/A	N/A	N/A
Disk Error Info		N/A	N/A	N/A
Disk Temp Check		N/A	N/A	N/A
Disk Life Time Check		N/A	N/A	N/A

NVMe Product – Support Function per OS Version

"Not supported" in the below tables indicates the feature is not supported due to Operating System availability.

PM/SM953

Feature		OS / Driver		
		Server 2012 R2 / Inbox Driver	Server 2016 RS1 / Inbox Driver	Linux
Device List		○	○	○
Disk Details		N/A	N/A	N/A
Identify		○	○	○
SMART		Not supported	○ (Do Not Support Extended SMART)	○ (Do Not Support Extended SMART)
Secure Erase		N/A	N/A	N/A
Set Max		N/A	N/A	N/A
Firmware Update		N/A	N/A	N/A
Firmware Download		○	○	○
Firmware Commit		Not supported	Not supported	○
SCT Command		N/A	N/A	N/A
Format Namespace		Not supported	Not supported	○
Management Namespace		Not supported	Not supported	○
FA Log		Not supported	Not supported	○
PLP		N/A	N/A	N/A
DSLR		N/A	N/A	N/A
SNOR		N/A	N/A	N/A
On-demand Dump		N/A	N/A	N/A
Option Rom Download		Not supported	Not supported	○
Health Monitor	List	N/A	N/A	N/A
	Others	N/A	N/A	N/A
Firmware Info Check		Not supported	○	○
Disk Error Info		Not supported	○	○
Disk Temp Check		Not supported	○	○
Disk Life Time Check		Not supported	○	○

PM963

Feature		OS / Driver		
		Server 2012 R2 / Inbox Driver	Server 2016 RS1 / Inbox Driver	Linux
Device List		○	○	○
Disk Details		N/A	N/A	N/A
Identify		○	○	○
SMART		Not supported	○	○
Secure Erase		N/A	N/A	N/A
Set Max		N/A	N/A	N/A
Firmware Update		N/A	N/A	N/A
Firmware Download		○	○	○
Firmware Commit		Not supported	Not supported	○
SCT Command		N/A	N/A	N/A
Format Namespace		Not supported	Not supported	○
Management Namespace		Not supported	Not supported	○
FA Log		Not supported	N/A	○
PLP		Not supported	Not supported	○
DSLR		N/A	N/A	N/A
SNOR		N/A	N/A	N/A
On-demand Dump		N/A	N/A	N/A
Option Rom Download		Not supported	Not supported	○
Health Monitor	List	○	○	
	Others	○	○	
Firmware Info Check		Not supported	○	○
Disk Error Info		Not supported	○	○
Disk Temp Check		Not supported	○	○
Disk Life Time Check		Not supported	○	○

PM983, SZ983, SZ985, 983 ZET, 983 DCT, 983 DCT M.2

Feature		OS / Driver		
		Server 2012 R2 / Inbox Driver	Server 2016 RS1 / Inbox Driver	Linux
Device List		○	○	○
Disk Details		N/A	N/A	N/A
Identify		○	○	○
SMART		○	○	○
Secure Erase		N/A	N/A	N/A
Set Max		N/A	N/A	N/A
Firmware Update		N/A	N/A	N/A
Firmware Download		○	○	○
Firmware Commit		Not supported	Not supported	○
SCT Command		N/A	N/A	N/A
Format Namespace		Not supported	Not supported	○
Management Namespace		Not supported	Not supported	○
FA Log		○	○	○
PLP		N/A	N/A	N/A
DSLR		N/A	N/A	N/A
SNOR		○	○	○
On-demand Dump		○	○ (SZ983/5, 983 ZET do not Support this feature)	○
Option Rom Download		○	○	○
Health Monitor	List	○	○	○
	Others	○	○ (SZ983/5, 983 ZET do not Support Analyze feature)	○ (SZ983/5, 983 ZET do not Support Analyze feature)
Firmware Info Check		Not supported	○	○
Disk Error Info		Not supported	○	○
Disk Temp Check		Not supported	○	○
Disk Life Time Check		Not supported	○	○

Command Line Options

The Samsung DC Toolkit uses Command Line Interface (CLI)

The table given below briefly explains the available command line options. The detailed description of each feature is provided in the next sections of this chapter. For the purpose of illustration, the name of the tool for all examples will be “DCToolkit” to simplify documentation.

OS	Comments
-H [--help]	SATA, NVMe
-C [--command-history]	SATA, NVMe
-L [--list]	SATA, NVMe
-HM [--health-monitor]	SATA, NVMe Partially supported
-I [--info]	SATA
-ID [--identify]	SATA, NVMe
-F [--firmware-update]	SATA
-E [--erase]	SATA
-S [--smart]	SATA
-M [--setmax]	SATA
-X [--sct]	SATA
-V [--vendor-utility]	SATA
-NG [--nvme-get-log-page]	NVMe
-NF [--nvme-format-namespace]	NVMe (Linux / Samsung Driver)
-NM [--nvme-management-namespace]	NVMe (Linux / Samsung Driver)
-ND [--nvme-firmware-download]	NVMe
-NC [--nvme-firmware-commit]	NVMe (Linux /Samsung Driver)
-NV [--nvme-vendor-utility]	NVMe

Description of Command Line

Option	Description	Arguments	Arguments Description
-L	Show disks Attached to the system.	N/A	N/A
-I	Used to display details of the selected disk.	N/A	N/A
-ID	Shows Identify information	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-p [--path]	Set the path for saving the Output file.
-F	Used to update the firmware of the selected disk connected to HOST system.	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-p [--fwpackage-path]	Path to the directory containing firmware files.
		--force [--force]	Used to bypass the user prompt.
		-s [--source]	Source firmware revision, use with option 'A'.
-E	Used to erase all the data on the drive by issuing an ATA Format Unit command.	-d [--disk]	Used to input the physical disk index listed in the --list command.
		--force [--force]	Used to bypass the user prompt.
-S	Used to select a specific drive connected to the system and get the	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-q [--query]	Displays the available LBA percentage
		-t [--temperature]	Logs the temperature of the SSD in the file path provided or if no argument is given, then temperature will be logged into file in default folder, refer to Smart temperature logging file location
		-e [--execute]	"--[offline/captive|short/extended/selective]" execute SMART Short/Extended/Selective self-test routine in off-line/captive mode. "--abort" abort off-line mode self-test routine. "--checkstatus" get the current progress and result of off-line self-test.
-M	Performs SETMAX related operations on specified SSD.	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-s [--set]	Set Max address value with the given number.
		-r [--read-native-max]	Retrieve Native Max Address of the specified disk.
-V	Used to execute Vendor Utility Commands for specified disk.	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-fa [--FAlog-dump]	Extract the log data from a coreview block of the SSD. This is also called CTrace Dump.
		-plp [--PLP-log]	Enables the user to extract the PLP log data from a coreview block of the SSD.
		-dslr [--DSLR]	Extract DSLR information from the SSD.
		-p [--path]	Set the path for saving the Output file.

Option	Description	Arguments	Arguments Description
-X	SCT command execution	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-wb [--writesame-pattern-background]	Execute write same pattern in the Background
		-wf [--wrtiesame-pattern-foreground]	Execute write same pattern in the Foreground
		-xg [--writecache-get]	Get the state of SCT Write Cache
		-xs [--writecache-set]	Set the use of SCT Write Cache(Enable, Disable)
		-xsnv [--writecache-set-non-volatile]	Set the use of SCT Write Cache as non-volatile(Enable, Disable)
		-rg [--reordering-get]	Get the state of SCT Volatile Write Cache Reordering
		-rs [--reordering-set]	Set the use of SCT Volatile Write Cache Reordering (Enable, Disable)
		-rsnv [--reordering-set-non-volatile]	Set the use of SCT Volatile Write Cache Reordering as non-volatile
		-lg [--temperature-logging-get]	Get the current value of Temperature Logging Interval (in minutes)
		-ls [--temperature-logging-set]	Set Temperature Logging Interval (in minutes)
		-t [--temperature-history]	Show HDA Temperature History
-NG	Display Log Pages on specified NVMe disk	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-e [--error]	Display the Error Information.
		-s [--smart]	Display the SMART/Health information.
		-se [--smart-extended]	Extracts the extended SMART values.
		-f [--firmware]	Display the firmware slot information.
		-t [--temperature]	Display the temperature of selected device.
		-l [--lifetime]	Display the remained life time of the selected device (%)
-NF	Execute format command on specified NVMe disk	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-ue [--user-data-erase]	Erase the all user data on selected device.
		-ce [--cryptographic-erase]	All user data shall be erased cryptographically.
		--force [--force]	Used to bypass the user prompt.
-NM	Execute Namespace management command on specified NVMe disk	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-sl [--set-lba]	Execute Namespace management command on specified NVMe disk
		--force [--force]	Used to bypass the user prompt.

Option	Description	Arguments	Arguments Description
-ND	Updates firmware to specified NVMe disk	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-p [--path]	Firmware image path to download on specified disk.
		-a [--action]	Specifies the action that is taken on the image downloaded with the Firmware Download Feature.
		-s [--slot]	Specifies the firmware slot that shall be used for Commit Action, if applicable.
		-src [--source]	Source firmware revision, use with option 'A' (update multiple devices at ones).
		--force [--force]	Used to bypass the user prompt.
-NC	Commit the firmware image on specified NVMe disk.	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-a [--action]	Specifies the action that is taken on the image downloaded with the Firmware Download Feature.
		-s [--slot]	Specifies the firmware slot that shall be used for Commit Action, if applicable.
-NV	Extract the log data from a coreview block of the SSD.	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-fa [--falog-dump]	Extract the log data from a coreview block of the SSD.
		-plp [--PLP-log]	Enables the user to extract the PLP log data from a coreview block of the SSD.
		-od [--optionrom-download]	Download Optionrom binary.
		-snor [--snor-log]	Extract the log data from SNOR of the SSD
		-de [--ondemand-dump]	Extract the dump from the SSD at the time the user requests
		-p [--path]	Set the path for saving the Output file.
-HM	Execute Health Monitor Feature.	-d [--disk]	Used to input the physical disk index listed in the --list command.
		-L [--list]	Show disks attached to the system.
		-E [--extract]	Extract the values from the device.
		-A [--analyze]	Analyze the device attached on system.
		-all [--all]	Execute all Health Monitor features.
		-S [--smart]	Show SMART values of specified disk.
		-NS [--nvme-smart]	Display Log Pages(NVMe SMART) on specified NVMe disk.
		-NES [--nvme-extended-smart]	Display Log Pages(NVMe Extended SMART) on specified NVMe disk.
		-p [--path]	The directory path to save the results of this feature.
-C	Used to display the history of the previously executed commands.	N/A	N/A
-H	Used to display the command line options	N/A	N/A

How to Use DC Toolkit

Starting Samsung DC Toolkit software

Find a DCToolkit file and execute.

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================
Usage: DCToolkit.exe [operation] ...

Allowed Operations:
--------------------------------------------------------------------------------
-L  [ --list                      ]  Shows disks attached to the system
-I  [ --info                      ]  Displays the disk details
-ID [ --identify                  ]  Shows Identify Informations
-F  [ --firmware-update           ]  Updates firmware to specified disk
-E  [ --erase                     ]  Securely Erases all data from specified disk
-S  [ --smart                     ]  Shows SMART values of specified disk
-M  [ --setmax                    ]  Perform SetMax related operations on specified disk
-X  [ --sct                       ]  Executes SCT Commands on specified disk
-V  [ --vendor-utility            ]  Execute Vendor Unique command on specified disk
-NG [ --nvme-get-log-pages        ]  Display Log Pages on specified NVMe disk
-NF [ --nvme-format-namespace     ]  Execute format command on specified NVMe disk
-NM [ --nvme-management-namespace ]  Execute management command on specified NVMe disk
-ND [ --nvme-firmware-download    ]  Updates firmware to specified NVMe disk
-NC [ --nvme-firmware-commit      ]  Commit the firmware image on specified NVMe disk
-NV [ --nvme-vendor-utility       ]  Execute Vendor Unique command on specified NVMe disk
-HM [ --health-monitor            ]  Execute Health Monitor feature.
-C  [ --command-history           ]  Shows history of the previously executed commands
-H  [ --help                      ]  Shows detailed help
--------------------------------------------------------------------------------
```

	Commands
Arguments	None
Used with	-E [--erase], -F [--firmware-update], S [--smart], -I [--info], -M [--setmax], -X [--sct], -ID [--identify] -NG [--nvme-get-log-pages], -NF [--nvme-format-namespace], -NM [--nvme-management-namespace], -ND [--nvme-firmware-download], -NC [--nvme-firmware-commit]
Usage	DCToolkit --disk 1 --erase DCToolkit --disk 1 --firmware-update --path <filepath> DCToolkit --disk 1 --smart DCToolkit --disk 1 --setmax --set 123456 DCToolkit --disk 1 --info DCToolkit --disk 1 --sct --writecache-get DCToolkit --disk 1 --identify DCToolkit –disk 1:c --nvme-format-namespace --user-data-erase DCToolkit –disk 1:c --nvme-management-namespace --set-lba 900000000 DCToolkit –disk 1:c --nvme-firmware-download --path {path} --action 1 --slot 2 DCToolkit –disk 1:c --nvme-firmware-commit --action 2 --slot 1 [or] DCToolkit -d 1 -E DCToolkit -d 1 -F -p <fwpackage-path> DCToolkit -d 1 -S DCToolkit -d 1 -M -s 123456 DCToolkit -d 1 –I DCToolkit –d 1 –X –xg DCToolkit –d 1 -ID DCToolkit –d 1:c -NF --ue DCToolkit –d 1:c -NM –sl 900000000 DCToolkit –d 1:c –ND –p {path} –a 1 –s 0 DCToolkit –d 1:c –NC –a 1 –s 0

-H [--help]

Display the command line options which are supported by DCToolkit application.

	Commands
Arguments	None
Used with	None
Usage	DCToolkit --help [or] DCToolkit -H

-C [--command-history]

Display the list of CLI commands executed previously by the user. Maximum log count is 500. If the log count exceeds 500, the oldest one is erased. The file is located in %appdata%DCToolkit\HistoryFiles\history.txt and the logger starts from 1 when the target file is erased.

	Commands
Arguments	None
Used with	None
Usage	DCToolkit --command-history [or] DCToolkit -C

--force

--force is used to bypass all the acknowledgements displayed by the tool and intimates the tool to complete the operation specified without any further user inputs. This option must be used cautiously as it will not prompt the user for the confirmation, which may result in severe data loss.

-d [--disk]

--disk is used to input the physical disk index listed in the --list command.

※ Note: Arguments provided above are only for illustration purpose.

For SSDs directly connected to the system, the disk number should be inputted as “-d 0” and for RAID configuration “-d 2:0:1”, where

2 -Library type, 0 -Controller number, and 1 -disk number.

-L [--list]

Display a list of attached Samsung SSDs.

	Commands
Arguments	None
Used with	None
Usage	DCToolkit --list [or] DCToolkit –L

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================

-------------------------------------------------------------------------------------------------------------------------------
| Disk   | Path               | Model                    | Serial               | Firmware | Optionrom | Capacity | Drive  | Total Bytes | NVMe Driver          |
| Number |                    |                          | Number               |          | Version   |          | Health | Written     |                      |
-------------------------------------------------------------------------------------------------------------------------------
| 0      | \\.\PHYSICALDRIVE0 | SAMSUNG MZ7LM960HMJP-000 | S361NX0H500015       | GXT51M3Q | N/A       |   894 GB | GOOD   | 0.00 TB     | N/A                  |
-------------------------------------------------------------------------------------------------------------------------------
| *2     | \\.\PHYSICALDRIVE2 | SAMSUNG MZ7LM960HMJP-000 | S361NX0H500008       | GXT51W3Q | N/A       |   894 GB | GOOD   | 0.74 TB     | N/A                  |
-------------------------------------------------------------------------------------------------------------------------------
| 0:c    | \\.\PHYSICALDRIVE3 | SAMSUNGMZQLW960HMJP-000  | S2UHNX0H400371       | CXV82M1Q | PNUSR011  |   894 GB | GOOD   |  0.00 TB    | Windows Inbox Driver |
-------------------------------------------------------------------------------------------------------------------------------
| 1:c    | \\.\PHYSICALDRIVE4 | SAMSUNGMZQLW960HMJP-000  | S2UHNX0H400294       | CXV82M1Q | PNUUNI13  |   894 GB | GOOD   |  0.00 TB    | Windows Inbox Driver |
-------------------------------------------------------------------------------------------------------------------------------
| 2:c    | \\.\PHYSICALDRIVE5 | SAMSUNGNVMeSSDxM961      | 0123456789ABCDEF0000 | 1B6QCXP7 |           |   953 GB | GOOD   |  0.00 TB    | Windows Inbox Driver |
-------------------------------------------------------------------------------------------------------------------------------
```

‹List›

※Note

For normal SSDs connected directly to the system, the “Disk Number” is displayed as a single or natural number (0 or 1 or 2 etc.), but under RAID configuration, the “Disk Number” will be shown in libtype:ctrlid:diskid format(eg- 2:0:1), where 2 – Library type, 0 – Controller Number and 1 – Disk Number. Refer to 4.3 Display Disk List.

In case of NVME device, the Disk Number is displayed as duel number (0:c or 1:c or 2:c etc).

In the case of the capacity listed, the capacity is different from the capacity of model name (IDEMA rule)

-ID [--identify]

Displays Identify information

Output file will be saved under the path %appdata%DCToolkit\VendorUtility\ by default if no other path is specified.

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -ID [ --identify ] [parameter-list]

Example:
  DCToolkit.exe --disk 0 --identify
  DCToolkit.exe --disk 0:c --identify
  DCToolkit.exe --disk 0 --identify --path ./
  DCToolkit.exe --disk 0:c --identify --path ./
  [or]
  DCToolkit.exe -d 0 -ID
  DCToolkit.exe -d 0:c -ID
  DCToolkit.exe -d 0 -ID -p ./
  DCToolkit.exe -d 0:c -ID -p ./
  DCToolkit.exe --disk A --identify
  DCToolkit.exe --disk A --identify --path ./

Sub Options:
  -d [ --disk ] Disk-Number of the disk to make a Indentify Informations raw File
   A [ A      ] Make Identify Information raw files for all devices.
  -p [ --path ] Path where the file will be created.
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-p [--path]
Used with	Set the path for saving the identify data
Usage	DCToolkit --disk 0 --identify (--path ./) DCToolkit --disk 0:c --identify (--path ./) DCToolkit --disk A --identify (--path ./) [or] DCToolkit –d 0 -ID (-p ./) DCToolkit –d 0:c -ID (-p ./) DCToolkit –d A –ID (-p ./)

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================

IDENTIFY data ouput: C:\Users\hyo\AppData\Roaming\DCToolkit\VendorUtility\10020C90007312160010_Log_SATA_IDENTIFY.bin
```

-S [--smart]

Used to select a specific drive connected to the system and get the SMART Value.

For example, if --disk X is specified, where X is the physical disk index, it lists down the SMART attributes of the disk X connected to HOST system.

Also used to log temperature of the disk and estimate its life time and the percentage of the available LBA to replace.

Also used to execute SMART Self-Test.

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -S [ --smart ] [parameter-list]

Example:
  DCToolkit.exe --disk 1 --smart [or] DCToolkit.exe -d 1 -S
  DCToolkit.exe --disk 1 --smart --temperature [or] DCToolkit.exe -d 1 -S -t
  DCToolkit.exe --disk 1 --smart --temperature [file-path] [or] DCToolkit.exe -d 1 -S -t [file-path]
  DCToolkit.exe --disk 1 --smart --query [or] DCToolkit.exe -d 1 -S -q

  DCToolkit.exe --disk 1 --smart --execute [sub-option] [or] DCToolkit.exe -d 1 -S -e [sub-option]
  [sub-option] for --execute are --[offline/captive | short/extended/selective]
  [sub-option] --abort and --checkstatus


Sub Options:
  -d [ --disk        ] Disk-Number of the disk to show S M A R T values of
  -t [ --temperature ] Enables the user to log the temperature of the disk
  -q [ --query       ] Display the percentage of the available LBA to replace
  -e [ --execute     ] Execute SMART Self-Test on the specified disk.
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-t [--temperature] Enables the user to log the temperature of the disk. -q [--query] Displays the percentage of the available LBA to replace. subcommands. -e [--execute] Execute SMART Self-Test. --execute should be followed by --offlineshort, --offlineextended, --offlineselective, --captiveshort, --captiveextended, --captiveselective, --abort, --checkstatus subcommands.
Used with	--disk [or] -d
Usage	DCToolkit --disk 1 --smart DCToolkit --disk 1 --smart --temperature : Use default folder location DCToolkit --disk 1 --smart --temperature /home/ : Use /home/ folder location DCToolkit --disk 1 --smart --query DCToolkit --disk 1 --smart --execute --offlineshort DCToolkit --disk 1 --smart --execute --offlineextended DCToolkit --disk 1 --smart --execute --offlineselective DCToolkit --disk 1 --smart --execute --captiveshort DCToolkit --disk 1 --smart --execute --captiveextended DCToolkit --disk 1 --smart --execute --captiveselective DCToolkit --disk 1 --smart --execute --abort DCToolkit --disk 1 --smart --execute --checkstatus [or] DCToolkit -d 1 -S

	DCToolkit -d 1 -S -t : Uses default folder location DCToolkit -d 1 -S -t /home/ : Uses /home/ folder location DCToolkit -d 1 -S -q DCToolkit -d 1 -S -e --offlineshort DCToolkit -d 1 -S -e --offlineextended DCToolkit -d 1 -S -e --offlineselective DCToolkit -d 1 -S -e --captiveshort DCToolkit -d 1 -S -e --captiveextended DCToolkit -d 1 -S -e --captiveselective

Note:

- Default folder location is %appdata%DCToolkit/SMARTFiles/. Temperature will be logged into a file “Log_Temperature.txt” in default location if no valid file path is provided.
- To check the current progress of SMART OFF-LINE SelfTest, “--checkstatus" subcommand should be used.
- To stop the execution of SMART OFF-LINE SelfTest, “--abort" subcommand should be used.
- 860 DCT does not support -S -q command.
- In the PM863a and SM863a, ID 194 HDD Temperature value is displayed as 6 bytes and each byte designates the below table.

11	10	9	8	7	6	5	4	3	2	1	0
MAX Temperature				MIN Temperature				Current Temperature			

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================
--------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000   | Firmware Version: GXT51M3Q
--------------------------------------------------------------------------------
| ID  |  Description                      |  Raw     |  Raw(hex)   |  Normalized |  Worst |  Threshold |  Status |
--------------------------------------------------------------------------------
| 5   | Reallocated Sector Count          | 0        | 0x0         | 100         | 100    | 10         | OK      |
| 9   | Power-on Hours                    | 2        | 0x2         | 99          | 99     | 0          | OK      |
| 12  | Power-on Count                    | 4        | 0x4         | 99          | 99     | 0          | OK      |
| 177 | Wear Leveling Count               | 387      | 0x183       | 94          | 94     | 5          | OK      |
| 179 | Used Reserved Block Count (total) | 0        | 0x0         | 100         | 100    | 10         | OK      |
| 180 | Unused Reserved Block Count (total)| 3262    | 0xcbe       | 100         | 100    | 10         | OK      |
| 181 | Program Fail Count (total)        | 0        | 0x0         | 100         | 100    | 10         | OK      |
| 182 | Erase Fail Count (total)          | 0        | 0x0         | 100         | 100    | 10         | OK      |
| 183 | Runtime Bad Count (total)         | 0        | 0x0         | 100         | 100    | 10         | OK      |
| 184 | E2E Error Detection               | 0        | 0x0         | 100         | 100    | 97         | OK      |
| 187 | Uncorrectable Error Count         | 0        | 0x0         | 100         | 100    | 0          | OK      |
| 190 | Airflow Temperature               | 39       | 0x27        | 61          | 60     | 0          | OK      |
| 194 | HDD Temperature                   | 1572903  | 0x180027    | 61          | 60     | 0          | OK      |
| 195 | ECC Error Rate                    | 0        | 0x0         | 200         | 200    | 0          | OK      |
| 197 | Current Pending Sector Count      | 0        | 0x0         | 100         | 100    | 0          | OK      |
| 199 | CRC Error Count                   | 0        | 0x0         | 100         | 100    | 0          | OK      |
| 202 | SSD Mode Status                   | 0        | 0x0         | 100         | 100    | 10         | OK      |
| 235 | POR Recovery Count                | 2        | 0x2         | 99          | 99     | 0          | OK      |
| 241 | Total LBAs Written                | 210      | 0xd2        | 99          | 99     | 0          | OK      |
| 242 | Total LBAs Read                   | 186      | 0xba        | 99          | 99     | 0          | OK      |
| 243 | NAND Writes                       | 3563520  | 0x366000    | 100         | 100    | 0          | OK      |
| 244 | Thermal Throttle Status           | 0        | 0x0         | 100         | 100    | 0          | OK      |
| 245 | Timed Workload Media Wear         | 65535    | 0xffff      | 100         | 100    | 0          | OK      |
| 246 | Timed Workload Host Read/Write Ratio| 65535  | 0xffff      | 100         | 100    | 0          | OK      |
| 247 | Timed Workload Timer              | 65535    | 0xffff      | 100         | 100    | 0          | OK      |
| 251 | SATA Interface Downshifts (total) | 0        | 0x0         | 100         | 100    | 0          | OK      |
--------------------------------------------------------------------------------
WAI(Wear Acceleration Index): 3456066657.60
--------------------------------------------------------------------------------
[SUCCESS] Smart feature completed successfully.
--------------------------------------------------------------------------------
```

‹simple SMART value ›

-F [--firmware-update]

Update the firmware of the selected Samsung SSD connected to the Host system.

If --force is not used, then the user will be prompted whether or not to continue the command.

When using A(updating multiple devices), primary device is exclusive because of stability.

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -F [ --firmware-update ] [parameter-list]

Example:
  DCToolkit.exe --disk 1 --firmware-update --fwpackage-path /path/dsrdenc
  [or] DCToolkit.exe -d 1 -F -p /path/dsrdenc
  DCToolkit.exe --disk 1 --firmware-update --fwpackage-path /path/dsrdenc --force
  [or] DCToolkit.exe -d 1 -F -p /path/dsrdenc --force
  DCToolkit.exe --disk A --firmware-update --fwpackage-path /path/dsrdenc --source "ABCD1234" (--force)
  [or] DCToolkit.exe -d A -F -p /path/dsrdenc -s "ABCD1234" (--force)

Sub Options:
      -d [ --disk           ] Disk-Number of the disk or A to select all supported disks to upd
                              ate firmware on.
      -p [ --fwpackage-path ] Path to the FW binary file.
  --force [ --force         ] Enables the user to perform Firmware Download without prompting f
                              or any confirmations.
      -s [ --source         ] source firmware revision, use with option 'A'(update multiple dev
                              ices at ones).
       A [ A                ] updating all SATA devices(except primary device) to specific targ
                              et firmware, use character 'A' instead of disk number.
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	‹fwpackage-path› [This argument provides the path to the directory containing firmware files and it should be given just after the switch]
Used with	--disk [or] -d
Usage	DCToolkit --disk 1 --firmware-update --fwpackage-path ‹ fwpackage-path › (--force) DCToolkit --disk A --firmware-update --fwpackage-path ‹ fwpackage-path › --source abcd1234 (--force) [or] DCToolkit -d 1 -F -p ‹ fwpackage-path › (--force) DCToolkit -d A -F -p ‹ fwpackage-path › -s abcd1234 (--force) (adcd1234 means FW revision)

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000   | Firmware Version: GXT51M3Q
------------------------------------------------------------------------------------------------
  [[ WARNING ]]

  Please Note that Firmware Update may format the disk and you will lose your data
  Please Ensure that data backup is taken before proceeding to Firmware Update
  If you are sure then only proceed, otherwise restart the application after taking a backup
  Continue Firmware image download ? [ yes ]: yes
------------------------------------------------------------------------------------------------
[SUCCESS] Downloaded firmware image successfully
------------------------------------------------------------------------------------------------
```

‹FW update›

-E [--erase]

Erase all the data on the drive by using an ATA Format Unit command.

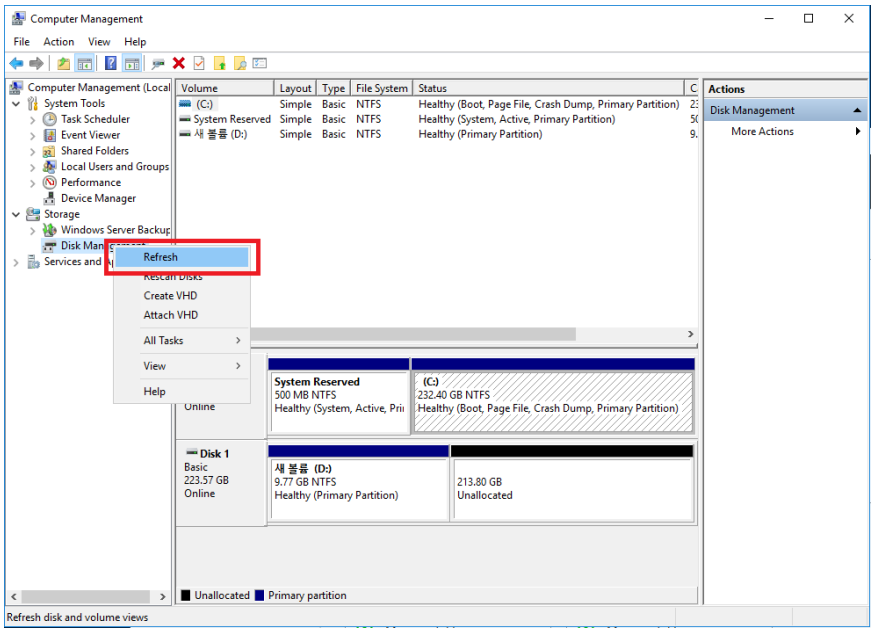
If --force is not used, then the user will be prompted whether or not to continue the command. --force option must be used cautiously as it will not prompt the user for the confirmation, which may result in severe data loss.

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -E [ --erase ] [parameter-list]

Example:
  DCToolkit.exe --disk 1 --erase [or] DCToolkit.exe -d 1 -E --force

Sub Options:
       -d [ --disk   ] Disk-Number of the disk to be securely erased.
  --force [ --force ] Enables the user to perform Secure Erase without prompting for any confirm
                      ations.
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	None
Used with	--disk [or] -d
Usage	DCToolkit --disk 1 --erase [or] DCToolkit -d 1 –E

※ Caution

- 860 DCT may enter Security Lock state if the user tries to detach during Erase.
- 860 DCT does not support –E(Erase) command in Windows, PCH environments
- In order to check if the command has been executed without a problem, must refresh the Disk Management after executing the command.



Reference Output

```
C:\Users\dev-win10\Desktop\DC_Toolkit_OEM_V1_1_5_RC11>DC_Toolkit_EOM_V1_1_5.exe -d 0 -E
================================================================================================
Samsung SSD DC Toolkit OEM Version 1.1.5.11.1
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000   | Firmware Version: GXT51M3Q
------------------------------------------------------------------------------------------------
  [[ WARNING ]]

  All data on disk will be erased and cannot be recovered,
  Please take a back up of any data if necessary.
  Continue Secure Erase ? [ yes ]: yes
------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------
Completed [ 100% ]
[Erase] Secure Erase completed successfully
------------------------------------------------------------------------------------------------
```

<Erase disk>

-I [--info]

Display the details of the selected Samsung SSD.

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -I [ --info ]

Example:
  DCToolkit.exe --disk 1 --info [or] DCToolkit.exe -d 1 -I

Sub Options:
  -d [ --disk ] Disk-Number of the disk whose details has to be displayed.
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	None
Used with	--disk [or] -d
Usage	DCToolkit --disk 1 --info [or] DCToolkit -d 1 –I

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000   | Firmware Version: GXT51M3Q
------------------------------------------------------------------------------------------------
Over Provision          | Write Cache             | Max address             | SCT Write Cache
------------------------------------------------------------------------------------------------
No Partitions           | Enabled                 | 1875385008              | Not in effect
------------------------------------------------------------------------------------------------
SATA Phy Speed          | WWN                     | Power Status            |
------------------------------------------------------------------------------------------------
6.0Gb/s                 | 5002538c4029b2e2        | Active or Idle          |
------------------------------------------------------------------------------------------------
```

<Information of SATA disk>

-M [--setmax]

Perform SETMAX related operations on specified disk, which will decrease or increase the capacity of the SSD. (Can increase up to maximum capacity supported by the SSD).

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -M [ --setmax ] [parameter-list]

Example:
  DCToolkit.exe --disk 1 --setmax --set 12345678 [or] DCToolkit.exe -d 1 -M -s 12345678
  DCToolkit.exe --disk 1 --setmax --read-native-max [or] DCToolkit.exe -d 1 -M -r

Sub Options:
  -d [ --disk            ] Disk-Number of the disk to read/perform SET MAX operation on.
  -s [ --set             ] Sets SETMAX value on specified disk.
                           'arg' is amount of SETMAX value to be set on disk in decimal format.
  -r [ --read-native-max ] Reads Native MAX Address of specified disk.
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-s [--set] Set the disk's capacity by taking value in number of sectors in decimal. -r [--read-native-max] Display the native max address of the disk in the form of LBA.
Used with	--disk [or] -d
Usage	DCToolkit --disk 1 --setmax --set 1234566 DCToolkit --disk 1 --setmax --read-native-max [or] DCToolkit -d 1 -M -s 1234566 DCToolkit -d 1 -M –r

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000   | Firmware Version: GXT51M3Q
------------------------------------------------------------------------------------------------
Disk Capacity updated to 5GB.
SET MAX Operation Completed. PowerCycle the disk.
------------------------------------------------------------------------------------------------
```

‹Set SATA LBA size›

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000   | Firmware Version: GXT51M3Q
------------------------------------------------------------------------------------------------
Native SET MAX value of the disk is 1875385007 LBAs.
------------------------------------------------------------------------------------------------
```

‹Set MAX LBA size›

-X [--sct]

Used to run SCT Command.

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -X [ --sct ] [command] [command specific parameter-list]

Example:

  [ Execute Background/Foreground SCT Write Same command ]

  -w{b|f} [ --writesame-pattern-{background|foreground} ] {start}:{count}:{pattern}
  {start}: First logical sector to write (64bit hexadecimal)
  {count}: Number of logical sectors to fill (64bit hexadecimal)
  {pattern}: Pattern (32bit hexadecimal)
  * Not specifying the above three parameters returns the current state of the operation in progress
  * Using 0 value for count causes all-area fill

  DCToolkit.exe --disk 1 --sct --writesame-pattern-background 0x0:0x10:0xFF00FF00 [or]
  DCToolkit.exe -d 1 -X -wb 0x0:0x10:0xFF00FF00 [or]
  DCToolkit.exe -d 1 -X -wf 0x0:0x10:0xFF00FF00


  [ Get or Set SCT Write Cache status ]

  -x{s|g|: 1 for enable, 0 for disable, 2 for ineffective state not specifying the value returns current state

  DCToolkit.exe --disk 1 --sct --writecache-set 1 [or] DCToolkit.exe -d 1 -X -xs 1
  DCToolkit.exe --disk 1 --sct --writecache-get [or] DCToolkit.exe -d 1 -X -xg


  [ Set SCT Write Cache status non-volatile ]

  -xsnv [ --writecache-set-non-volatile] {arg}
  {arg}: Same as -xs
  * Value set using this feature will be preserved across resets


  [ Get or Set SCT Volatile Write Cache Ordering ]

  -r{s|g} [ --reordering-{set|get} ] {arg}
  {arg}: 1 for enable, 0 for disable, not specifying the value returns current state#
  DCToolkit.exe --disk 1 --sct --reordering-set 1 [or]
  DCToolkit.exe -d 1 -X -rs 0 [or]
  DCToolkit.exe -d 1 -X -rg


  [ Set SCT Volatile Write Cache Reordering non-volatile ]

  -rsnv [ --reordering-set-non-volatile] {arg}
  {arg}: Same as -rs
  * Value set using this feature will be preserved across resets


  [ Get or Set SCT Temperature Logging Interval ]

  -l{s|g} [ --temperature-logging-{set|get} ] {arg}
  {arg}: a value between 0x0000 to 0xFFFF to specify temperautre logging interval in minutes

  . DCToolkit.exe --disk 1 --sct --temperature-logging-set 0x1 [or]
  . DCToolkit.exe -d 1 -X -ls 0 [or]
  . DCToolkit.exe -d 1 -X -lg


  [ Get HDA temperature history ]

  -t [ --temperature-history ]
  DCToolkit.exe --disk 1 --sct --temperature-history [or] DCToolkit.exe -d 1 -X -t

Sub Options:
    -d [ --disk                          ] Disk-Number of the disk to get SCT write cache state
   -wb [ --writesame-pattern-background  ] Execute Background Write Same Pattern
   -wf [ --writesame-pattern-foreground  ] Execute Foreground Write Same Pattern
   -xg [ --writecache-get                ] Get the state of SCT Write Cache
   -xs [ --writecache-set                ] Enable or disable SCT Write Cache
 -xsnv [ --writecache-set-non-volatile   ] Enable or disable SCT Write Cache, non-volatile
   -rg [ --reordering-get                ] Get the state of SCT Volatile Write Cache Reordering
   -rs [ --reordering-set                ] Enable or disable SCT Volatile Write Cache Reordering

 -rsnv [ --reordering-set-non-volatile   ] Enable or disable SCT Volatile Write Cache Reordering
                                           , non-volatile
   -lg [ --temperature-logging-get       ] Get current value of Temperature Logging Interval (in
                                            minutes)
   -ls [ --temperature-logging-set       ] Set the value of Temperature Logging Interval (in min
                                           utes)
    -t [ --temperature-history           ] Display HDA Temperature History
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	wb [--writesame-pattern-background] Execute Background write same pattern after receiving logical sector, logical sector number and pattern as an input -wf [--writesame-pattern-foreground] Execute Foreground write same pattern after receiving logical sector, logical sector number and pattern as an input -xg [--writecache-get] Get the state of SCT Write Cache -xs [--writecache-set] Set the use of SCT Write Cache (1: Enable, 0: Disable) -xsnv [--writecache-set-non-volatile] Set the use of SCT Write Cache as non-volatile (1: Enable, 0: Disable) -rg [--reordering-get] Get the state of SCT Volatile Write Cache Reordering -rs [--reordering-set] Set the use of SCT Volatile Write Cache Reordering (1: Enable, 0: Disable) -rsnv [--reordering-set-non-volatile] Set the use of SCT Volatile Write Cache Reordering as non-volatile (1: Enable, 0: Disable) -lg [--temperature-logging-get] Get the current value of Temperature Logging Interval (in minutes) -ls [--temperature-logging-set] Set the value of Temperature Logging Interval. (in minutes) -t [--temperature-history] Display HDA Temperature History.
Used with	--disk [or] -d
Usage	DCToolkit --disk 1 --sct --writesame-pattern-background 0x0:0x10:0xFF00FF00 DCToolkit --disk 1 --sct --writesame-pattern-foreground 0x0:0x10:0xFF00FF00 DCToolkit --disk 1 --sct --writecache-set 1 DCToolkit --disk 1 --sct --writecache-get DCToolkit --disk 1 --sct --writecache-set-non-volatile 1 DCToolkit --disk 1 --sct --reordering-set 1 DCToolkit --disk 1 --sct --reordering-get DCToolkit --disk 1 --sct --reordering-set-non-volatile 1 DCToolkit --disk 1 --sct --temperature-logging-set 0x1 DCToolkit --disk 1 --sct --temperature-logging-get DCToolkit --disk 1 --sct --temperature-history [or] DCToolkit -d 1 -X -wb 0x0:0x10:0xFF00FF00 DCToolkit -d 1 -X -wf 0x0:0x10:0xFF00FF00 DCToolkit -d 1 -X -xs 1 DCToolkit -d 1 -X -xg DCToolkit -d 1 -X -xsnv 1 DCToolkit -d 1 -X -rs 0 DCToolkit -d 1 -X -rg DCToolkit -d 1 -X -rsnv 0 DCToolkit -d 1 -X -ls 1 DCToolkit -d 1 -X -lg DCToolkit -d 1 -X -t

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1 | Model Name: SAMSUNG SSD -A- | Firmware Version: HXT71W3Q
------------------------------------------------------------------------------------------------
  [[ WARNING ]]

  Please Note that Write Same Pattern Command may modify the disk and you will lose your data.
  Please Ensure that data backup is taken before proceeding to Write Same Pattern Command.
  If you are sure then only proceed, otherwise restart the application after taking a backup.
  Continue Write Same ? [ yes ]: yes
------------------------------------------------------------------------------------------------
SCT: Write Same Background started with:
Start: 0x0, Count:0x10, Pattern:0xff00ff00

SCT: [SUCCESS] Write Same completed-----------------------------------------------------------------
[SUCCESS] SCT feature completed successfully.
------------------------------------------------------------------------------------------------
```

<Write Same Pattern Background >

```
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================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1 | Model Name: SAMSUNG SSD -A- | Firmware Version: HXT71W3Q
------------------------------------------------------------------------------------------------
SCT: [SUCCESS] SCT Write Cache is disabled.
------------------------------------------------------------------------------------------------
[SUCCESS] SCT feature completed successfully.
------------------------------------------------------------------------------------------------
```

<Get the state of SCT Write Cache>

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1 | Model Name: SAMSUNG SSD -A- | Firmware Version: HXT71W3Q
------------------------------------------------------------------------------------------------
SCT: [SUCCESS] Volatile Write Cache Reordering is enabled
------------------------------------------------------------------------------------------------
[SUCCESS] SCT feature completed successfully.
------------------------------------------------------------------------------------------------
```

<Get the state of SCT Volatile Write Cache Reordering>

```
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================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1 | Model Name: SAMSUNG SSD -A- | Firmware Version: HXT71W3Q
------------------------------------------------------------------------------------------------
SCT: Temperature logging interval is 5 minutes
------------------------------------------------------------------------------------------------
[SUCCESS] SCT feature completed successfully.
------------------------------------------------------------------------------------------------
```

<Get current value of Temperature Logging Interval>

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1 | Model Name: SAMSUNG SSD -A- | Firmware Version: HXT71W3Q
------------------------------------------------------------------------------------------------
SCT: HDA Temperature History table
    Sampling period (mins) : 1
    Timer interval (mins)  : 5
    Max Op Limit (C)       : 70
    Over Limit (C)         : 70
    Min Op Limit (C)       : 0
    Under Limit (C)        : 0
    Temperature history
        [NOTICE]
        1. Last seen first
        2. A value of 0x80 indicates initial value or disconinuity in temperature recoding
        No.  0:   34 / 0x22
        No.  1: -128 / 0x80
        No.  2: -128 / 0x80
        No.  3: -128 / 0x80
        No.  4: -128 / 0x80
        No.  5: -128 / 0x80
        No.  6: -128 / 0x80
        No.  7: -128 / 0x80
        No.  8: -128 / 0x80
        No.  9: -128 / 0x80
        No. 10: -128 / 0x80
        No. 11: -128 / 0x80
                ...
        No. 109: -128 / 0x80
        No. 110: -128 / 0x80
        No. 111: -128 / 0x80
        No. 112: -128 / 0x80
        No. 113: -128 / 0x80
        No. 114: -128 / 0x80
        No. 115: -128 / 0x80
        No. 116: -128 / 0x80
        No. 117: -128 / 0x80
        No. 118: -128 / 0x80
        No. 119: -128 / 0x80
        No. 120: -128 / 0x80
        No. 121: -128 / 0x80
        No. 122: -128 / 0x80
        No. 123: -128 / 0x80
        No. 124: -128 / 0x80
        No. 125: -128 / 0x80
        No. 126: -128 / 0x80
        No. 127: -128 / 0x80
------------------------------------------------------------------------------------------------
[SUCCESS] SCT feature completed successfully.
------------------------------------------------------------------------------------------------
```

‹Get HAD Temperature History›

-V [--vendor-utility]

Used to execute Vendor Utility Commands

Output file will be saved under the path %appdata%DCToolkit\VendorUtility\ by default if no other path is specified.

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -V [ --vendor-utility ] [parameter-list]

Example:
  DCToolkit.exe --disk 1 --vendor-utility --FAlog-dump [or] DCToolkit.exe -d 1 -V -fa
  DCToolkit.exe --disk 1 --vendor-utility --FAlog-dump --path c:\ [or] DCToolkit.exe -d 1 -V -fa -p c:\
  DCToolkit.exe --disk 1 --vendor-utility --PLP-log [or] DCToolkit.exe -d 1 -V -plp
  DCToolkit.exe --disk 1 --vendor-utility --PLP-log --path c:\ [or] DCToolkit.exe -d 1 -V -plp -p c:\
  DCToolkit.exe --disk 1 --vendor-utility --DSLR [or] DCToolkit.exe -d 1 -V -dslr
  DCToolkit.exe --disk 1 --vendor-utility --DSLR --path c:\ [or] DCToolkit.exe -d 1 -V -dslr -p c:\

Sub Options:
     -d [ --disk        ] Disk-Number of the disk to execute Vendor Utility command.
    -fa [ --FAlog-dump  ] Extract the log data from a coreview block of the SSD.
   -plp [ --PLP-log     ] Enables the user to extract the PLP log data from a coreview block of
                          the SSD.
  -dslr [ --DSLR        ] Extracts DSLR from the SSD.
     -p [ --path        ] Output path to make output file
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-fa [--FAlog-dump] Enables the user to extract the log data from a coreview block of the SSD -plp [--PLP-log] Enables the user to extract the PLP log data from a coreview block of the SSD.(Maximum size: 780MB) -dslr [--DSLR] Extract DSLR data from the SSD -p [--path] Set the path for saving the Log data
Used with	--disk [or] -d
Usage	DCToolkit --disk 1 --vendor-utility --FAlog-dump (--path ./) DCToolkit --disk 1 --vendor-utility --PLP-log (--path ./) DCToolkit --disk 1 --vendor-utility --DSLR (--path ./) [or] DCToolkit -d 1 -V –fa (–p ./) DCToolkit -d 1 -V –plp (–p ./) DCToolkit -d 1 -V –dslr (–p ./)

Reference Output

```
MODE #1: FTL_PLP_ASSERT
MODE #2: POWER_GLITCH

FA data output: C:\Users\hyo\AppData\Roaming\DCToolkit\VendorUtility\20180806_16h54m57s_GXT5304Q_S361NX0H500045_FALogDump_HR.xml

FA data output: C:\Users\hyo\AppData\Roaming\DCToolkit\VendorUtility\20180806_16h54m57s_GXT5304Q_S361NX0H500045_FADump.zip
------------------------------------------------------------------------------------------------
```

‹Get FA Log›

```
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================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000AZ | Firmware Version: GXT5304Q
------------------------------------------------------------------------------------------------
100%

FA data output: C:\Users\hyo\AppData\Roaming\DCToolkit\VendorUtility\20180806_16h55m31s_GXT5304Q_S361NX0H500045_PLPLog.zip
------------------------------------------------------------------------------------------------
```

‹Get PLP Dump›

```
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================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 0 | Model Name: SAMSUNG MZ7LM960HMJP-000AZ | Firmware Version: GXT5304Q
------------------------------------------------------------------------------------------------

DSLR data output: C:\Users\hyo\AppData\Roaming\DCToolkit\VendorUtility\20180806_16h56m09s_GXT5304Q_S361NX0H500045_DSLR.txt
------------------------------------------------------------------------------------------------
```

‹Get DSLR Dump›

-NG [--nvme-get-log-pages]

Display Log Pages on specified NVMe disk

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -NG [ --nvme-get-log-pages ] [parameter-list]

Example:
  DCToolkit.exe --disk 0:c --nvme-get-log-pages --error {count}
  DCToolkit.exe --disk 0:c --nvme-get-log-pages --smart
  DCToolkit.exe --disk 0:c --nvme-get-log-pages --smart-extended
  DCToolkit.exe --disk 0:c --nvme-get-log-pages --firmware
  DCToolkit.exe --disk 0:c --nvme-get-log-pages --temperature
  DCToolkit.exe --disk 0:c --nvme-get-log-pages --lifetime
  [or]
  DCToolkit.exe -d 0:c -NG -e {count}
  DCToolkit.exe -d 0:c -NG -s
  DCToolkit.exe -d 0:c -NG -se
  DCToolkit.exe -d 0:c -NG -f
  DCToolkit.exe -d 0:c -NG -t
  DCToolkit.exe -d 0:c -NG -l

Sub Options:
   -d [ --disk           ] Disk-Number of the disk to get log pages.
   -e [ --error          ] Display the Error Information.
   -s [ --smart          ] Display the SMART/Health information.
  -se [ --smart-extended ] Extracts the extended SMART values.
   -f [ --firmware       ] Display the firmware slot information.
   -t [ --temperature    ] Display the temperature of selected device.
   -l [ --lifetime       ] Display the remained life time of the selected device (%).
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-e [--error] Display the Error Information. -s [--smart] Display the SMART/Health information. -se[--smart-extended] Extract the extended SMART values. -f [--firmware] Display the firmware slot information. -t [--temperature] Display the temperature of selected device. -l [--lifetime] Display the remained life time of the selected device (%).
Used with	--disk [or] -d
Usage	DCToolkitD --disk 1:c --nvme-get-log-pages --error {count} DCToolkitD --disk 1:c --nvme-get-log-pages --smart DCToolkitD --disk 1:c --nvme-get-log-pages --smart-extended DCToolkitD --disk 1:c --nvme-get-log-pages --firmware DCToolkitD --disk 1:c --nvme-get-log-pages --temperature DCToolkitD --disk 1:c --nvme-get-log-pages --lifetime [or] DCToolkitD -d 1:c -NG -e {count} DCToolkitD -d 1:c -NG –s DCToolkitD -d 1:c -NG –se DCToolkitD -d 1:c -NG -f DCToolkitD -d 1:c -NG -t DCToolkitD -d 1:c -NG -l

Reference Output

```
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================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1:c | Model Name: SAMSUNGNVMeSSDPM963 | Firmware Version: CXV83M1Q
------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------
| Index | Bytes | Description                          | Value              |
------------------------------------------------------------------------------
| 0     | 7:0   | Error Count                          | 0x0000000000000001 |
|       | 9:8   | Submission Queue ID                  | 0x0000             |
|       | 11:10 | Command ID                           | 0x0014             |
|       | 13:12 | Status Field                         | 0x4004             |
|       | 15:14 | Parameter Error Location             | 0x0028             |
|       | 23:16 | LBA                                  | 0x0000000000000000 |
|       | 27:24 | Namespace                            | 0x00000000         |
|       | 28    | VendorSpecific Information Available | 0x00               |
|       | 39:32 | Command Specific Information         | 0x0000000000000000 |
------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------
[Success] Get Log Page Feature completed successfully
------------------------------------------------------------------------------------------------
```
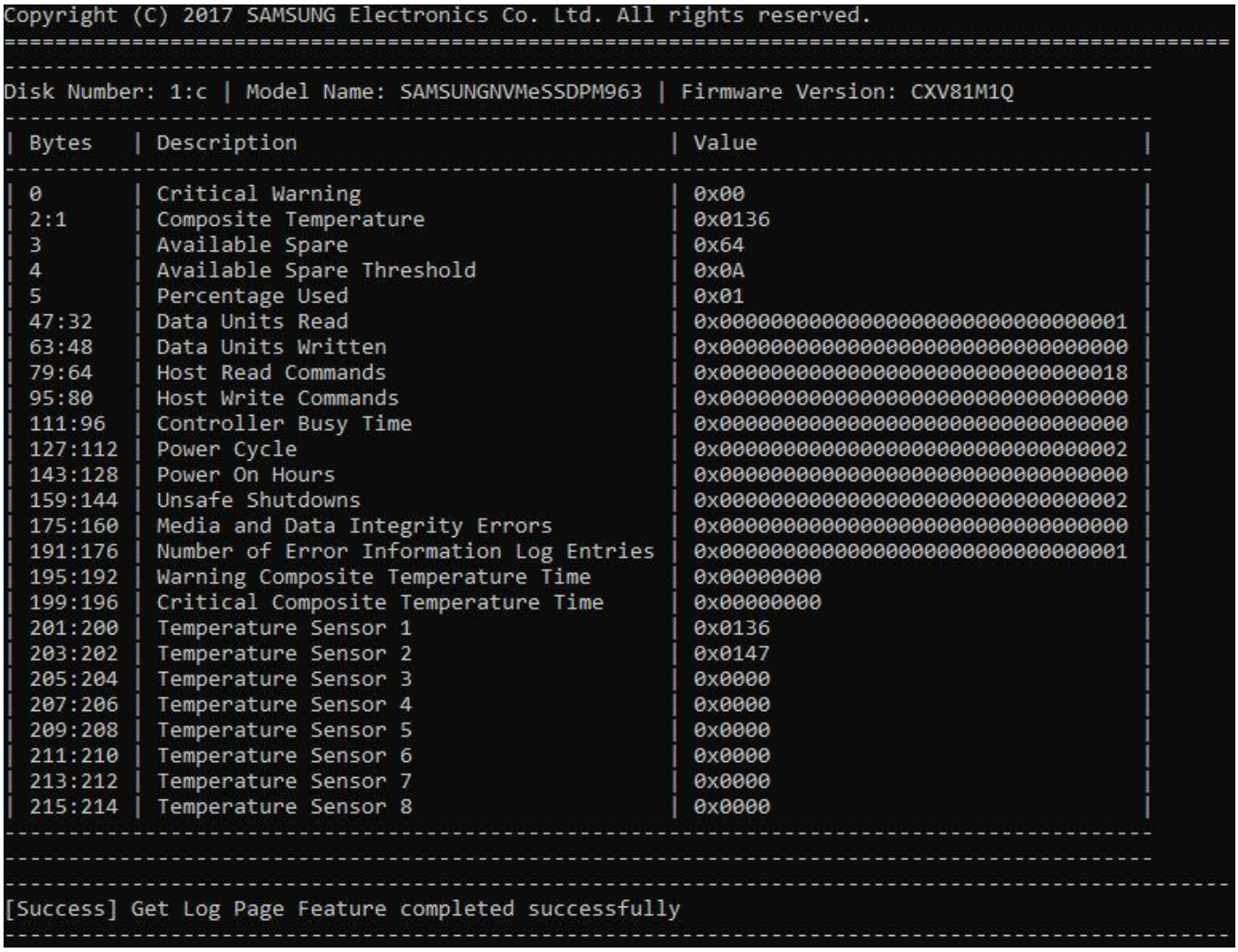

<Get error info>



‹Get NVMe SMART data›

```
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================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1:c | Model Name: SAMSUNGNVMeSSDPM963 | Firmware Version: CXV83M1Q
------------------------------------------------------------------------------------------------
| Bytes    | Description                                                | Value                                  |
------------------------------------------------------------------------------------------------
| 15:0     | Media Units Written                                        | 0x00000000000000000000000000000011     |
| 16       | Capacitor Health                                           | 0x64                                   |
| 32:17    | ECC Iterations                                             | 0x00000000000000000000000000000000     |
| 33       | Supported Features                                         | 0x01                                   |
| 40:34    | Temperature Throttling                                     | 0x00000000000000                       |
| 41       | Power Consumption(Optional)                                | 0xFF                                   |
| 42       | Wear Range Delta                                           | 0x08                                   |
| 48:43    | Unaligned I/O                                              | 0x000000000000                         |
| 52:49    | Mapped LBAs                                                | 0x00000000                             |
| 53       | Program Fail Count                                         | 0x00                                   |
| 54       | Erase Fail Count                                           | 0x00                                   |
| 58:55    | Max Controller Temp                                        | 0x00000035                             |
| 62:59    | Max NAND Temp                                              | 0x00000028                             |
| 66:63    | Controller MeltDown Count                                  | 0x00000000                             |
| 70:67    | NAND MeltDown Count                                        | 0x00000000                             |
| 74:71    | Controller DTT Count                                       | 0x00000000                             |
| 78:75    | NAND DTT Count                                             | 0x00000000                             |
------------------------------------------------------------------------------------------------
| 0        | Log Page ID                                                | 0xC1                                   |
| 3:2      | Flags                                                      | 0x0000                                 |
| 7:4      | Log Page Size                                              | 0x0000013C                             |
| 15:8     | Data Change Internal                                       | 0x0000000000000000                     |
| 35:32    | Lifetime write amplification factor                        | 0x00000000                             |
| 39:36    | Trailing hour write amplification factor                   | 0x00000000                             |
| 43:40    | Percentage of P/E cycles remaining                         | 0x00000062                             |
| 59:44    | Lifetime user writes                                       | 0x00000000000000000000000000000000     |
| 75:60    | Lifetime NAND writes                                       | 0x000000000000000000000000000041C8     |
| 91:76    | Lifetime user reads                                        | 0x0000000000000000000000000000001E     |
| 95:92    | Lifetime retired block count                               | 0x00000000                             |
| 97:96    | Current temperature                                        | 0x0135                                 |
| 99:98    | Capacitor health                                           | 0x0064                                 |
| 103:100  | Reserve block count                                        | 0x00001141                             |
| 111:104  | Lifetime read Reclaim count                                | 0x0000000000000000                     |
| 119:112  | Lifetime UECC count                                        | 0x0000000000000000                     |
| 123:120  | Lifetime reallocated sector count                          | 0x00000000                             |
| 139:124  | Power on hours                                             | 0x00000000000000000000000000000000     |
| 155:140  | Lifetime clean shutdown count on power loss(NPO count)     | 0x00000000000000000000000000000001     |
| 171:156  | Lifetime unclean shutdowns on power loss(SPO count)        | 0x00000000000000000000000000000000     |
| 175:172  | Perf Indicator                                             | 0x00000000                             |
| 179:176  | WearLevel Count                                            | 0x00000000                             |
| 183:180  | BAD TLP count                                              | 0x00000000                             |
| 187:184  | BAD DLLP count                                             | 0x00000000                             |
| 191:188  | PHY error count                                            | 0x00000000                             |
------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------
[Success] Get Log Page Feature completed successfully
------------------------------------------------------------------------------------------------
```

‹Get Extended SMART data›

```
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================================================================================================
 1:c | SAMSUNGNVMeSSDPM963 | CXV83M1Q
==========================================
 Kelvin degree : 311 K
 Celsius degree: 38 C
------------------------------------------------------------------------------------------------
[Success] Get Log Page Feature completed successfully
------------------------------------------------------------------------------------------------
```

‹Get temperature›

```
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================================================================================================
Current activated firmware: slot(#1, CXV83M1Q)
Next to be applied firmware: EMPTY

Firmware Slot Information:

  Slot #1: CXV83M1Q
  Slot #2: EMPTY
  Slot #3: EMPTY
  Slot #4: EMPTY
  Slot #5: EMPTY
  Slot #6: EMPTY
  Slot #7: EMPTY
  Slot #8: EMPTY
------------------------------------------------------------------------------------------------
[Success] Get Log Page Feature completed successfully
------------------------------------------------------------------------------------------------
```

<Get Firmware Info>

```
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================================================================================================
Estimated Life Time: 99 %
------------------------------------------------------------------------------------------------
[Success] Get Log Page Feature completed successfully
------------------------------------------------------------------------------------------------
```

<Get life time>

-NF [--nvme-format-namespace]

This function does not support at Windows Inbox driver.

This is the function of erasing user data

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -NF [ --nvme-format-namespace ] [parameter-list]

Example:
  DCToolkit.exe --disk 0:c --nvme-format-namespace --user-data-erase
  DCToolkit.exe --disk 0:c --nvme-format-namespace --user-data-erase --force
  DCToolkit.exe --disk 0:c --nvme-format-namespace --cryptographic-erase
  DCToolkit.exe --disk 0:c --nvme-format-namespace --cryptographic-erase --force
  [or]
  DCToolkit.exe -d 0:c -NF -ue
  DCToolkit.exe -d 0:c -NF -ue --force
  DCToolkit.exe -d 0:c -NF -ce
  DCToolkit.exe -d 0:c -NF -ce --force

Sub Options:
       -d [ --disk                ] Disk-Number of the disk to execute Format feature of.
      -ue [ --user-data-erase     ] Erase the all user data on selected device.
      -ce [ --cryptographic-erase ] All user data shall be erased cryptographically.
  --force [ --force               ] Enable the user to perform Format without prompting for any
                                    confirmations.
------------------------------------------------------------------------------------------------
```

Execute format command on specified NVMe disk

	Commands
Arguments	-ue [--user-data-erase] Erase the all user data on selected device. -ce [--cryptographic-erase] All user data shall be erased cryptographically.
Used with	--disk [or] -d
Usage	DCToolkit --disk 1:c --nvme-format-namespace --user-data-erase DCToolkitD --disk 1:c --nvme-format-namespace --cryptographic-erase [or] DCToolkit -d 1:c -NF -ue DCToolkit -d 1:c -NF -ce

-NM [--nvme-management-namespace]

This function does not support at Windows Inbox driver.

Execute management command on specified NVMe disk

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -NM [ --nvme-management-namespace ] [parameter-list]

Example:
  DCToolkit.exe --disk 0:c --nvme-management-namespace --set-lba 400000000
  DCToolkit.exe --disk 0:c --nvme-management-namespace --set-lba 400000000 --force
  [or]
  DCToolkit.exe -d 0:c -NM -sl 400000000
  DCToolkit.exe -d 0:c -NM -sl 400000000 --force

Sub Options:
       -d [ --disk    ] Disk-Number of the disk to execute namespace management feature of.
      -sl [ --set-lba ] Sets namespace lba size on selected device by capacity.
  --force [ --force   ] Enable the user to perform namespace management without prompting for an
                        y confirmations.
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-sl [--set-lba] Sets namespace lba size on selected device by capacity.
Used with	--disk [or] -d
Usage	DCToolkit --disk 1:c --nvme-management-namespace --set-lba 900000000 [or] DCToolkit -d 1:c -NM –sl 900000000

-ND [--nvme-firmware-download]

Updates firmware to specified NVMe disk. Some FW revision is activated immediately without reset. Because of this, result of action option 1(need reset) may defer to FW revision.

When using A(updating multiple devices), primary device can be exclusive because of stability.

```
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================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -ND [ --nvme-firmware-download ] [parameter-list]

Example:
  DCToolkit.exe --disk 0:c --nvme-firmware-download --path {path}
  DCToolkit.exe --disk 0:c --nvme-firmware-download --path {path} --action 1 --slot 2
  DCToolkit.exe --disk A --nvme-firmware-download --path {path} --action 1 --slot 2 --source "ABCD1234" (--force)
  [or]
  DCToolkit.exe -d 0:c -ND -p {path}
  DCToolkit.exe -d 0:c -ND -p {path} -a 1 -s 2
  DCToolkit.exe -d A -ND -p {path} -a 1 -s 2 -src "ABCD1234" (--force)

  Action:
  0: Downloaded image replace the image specified by the Firmware Slot
  This image is not activated

  1: Downloaded image replaces the image specified by the Firmware Slot.
  This image is activated at the next reset

Sub Options:
       -d [ --disk   ] Disk-Number of the disk to download the firmware image
       -p [ --path   ] Firmware image path to download on specified disk
       -a [ --action ] Specifies the action that is taken on the image downloaded
                       with the Firmware Download Feature
       -s [ --slot   ] Specifies the firmware slot that shall be used for Commit Action,
                       if applicable
     -src [ --source ] source firmware revision, use with option 'A'(update multiple devices at
                       ones).
        A [ A        ] updating all NVMe devices(except primary device) to specific target firmw
                       are, use character 'A' instead of disk number.
  --force [ --force  ] Enable the user to download firmware image without prompting for any conf
                       irmations
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-p [--path] Firmware image path to download on specified disk -a [--action] Specifies the action that is taken on the image downloaded with the Firmware Download Feature -s [--slot] Specifies the firmware slot that shall be used for Commit Action, if applicable -scr [--source] Used to download specific firmware to specific devices among all the connected devices, it is used along with 'A' option A [A] Access to all the connected NVMe devices without using specific device number Action: 0: Downloaded image replace the image specified by the Firmware Slot This image is not activated 1: Downloaded image replaces the image specified by the Firmware Slot. This image is activated at the next reset
Used with	--disk [or] -d

Usage	DCToolkit --disk 1 --nvme-firmware-download --path {path} --action 1 --slot 2 (--force) DCToolkit --disk A --nvme-firmware-download --path {path} --action 1 --slot 2 –source “abcd1234” (--force) [or] DCToolkit -d 1:c -ND –p {path} –a 1 –s 2 (--force) DCToolkit -d A -ND –p {path} –a 1 –s 2 src “abcd1234” (--force) abcd1234 means FW revisionDCToolkit -d 1:c -NM –sl 900000000

Detail Sub Option

a0	download fw at slot	FW IMAGE DOWNLOAD COMMAND + FW COMMIT (Commit Action 000b)COMMAND	v1.1 SPEC
a1	download fw and activaton after reset at slot	FW IMAGE DOWNLOAD COMMAND + FW COMMIT (Commit Action 001b)COMMAND	v1.1 SPEC

Reference Output

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Disk Number: 1:c | Model Name: SAMSUNGNVMeSSDPM963 | Firmware Version: CXV83M1Q
------------------------------------------------------------------------------------------------
  [[ WARNING ]]

  Please Note that Firmware Update may format the disk and you will lose your data
  Please Ensure that data backup is taken before proceeding to Firmware Update
  If you are sure then only proceed, otherwise restart the application after taking a backup
  Continue Firmware image download ? [ yes ]: yes
------------------------------------------------------------------------------------------------
[SUCCESS] Downloaded firmware image successfully
------------------------------------------------------------------------------------------------
```

‹NVMe FW Update›

-NC [--nvme-firmware-commit]

This function does not support at Windows Inbox driver.

Commit the firmware image on specified NVMe disk. In Windows servers, NVMe firmware commit command is controlled by Inbox driver. So, this command is not valid under Windows server.

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -NC [ --nvme-firmware-commit] [parameter-list]

Example:
  DCToolkit.exe --disk 0:c --nvme-firmware-commit --action 2 --slot 1
  [or]
  DCToolkit.exe -d 0:c -NC -a 2 -s 1

  Action:
  2: The image specified by the Firmware Slot is activated at the next reset

  3: The image specified by the Firmware Slot is requested
  to be activated immediately without reset

Sub Options:
  -d [ --disk   ] Disk-Number of the disk to execute firmware commit
  -a [ --action ] Specifies the action that is taken on the image downloaded
                  with the Firmware Download Feature
  -s [ --slot   ] Specifies the firmware slot that shall be used for the Commit Action,
                  if applicable
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-a [--action] Specifies the action that is taken on the image downloaded with the Firmware Download Feature -s [--slot] Specifies the firmware slot that shall be used for the Commit Action, if applicable Action: 2: The image specified by the Firmware Slot is activated at the next reset 3: The image specified by the Firmware Slot is requested to be activated immediately without reset
Used with	--disk [or] -d
Usage	DCToolkit --disk 1:c --nvme-firmware-commit --action 2 --slot 2 [or] DCToolkit -d 1:c –NC –a 2 –s 2

Detail Sub Option

a2	activation after reset at slot	FW COMMIT (Commit Action 010b) COMMAND	v1.1 SPEC
a3	activation immediately at slot	FW COMMIT (Commit Action 011b) COMMAND	v1.2 SPEC

-NV [--nvme-vendor-utility]

This function does not support at Windows Inbox driver. Execute Vendor Unique command on specified NVMe disk. Output file will be saved under the path %appdata%DCToolkit\VendorUtility\ by default if no other path is specified.

```
Copyright (C) 2017 SAMSUNG Electronics Co. Ltd. All rights reserved.
================================================================================================
------------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe -d [diskindex] -NV [ --nvme-vendor-utility ] [parameter-list]

Example:
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --falog-dump [or]
  DCToolkit.exe -d 0:c -NV -fa
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --falog-dump --path c:\ [or]
  DCToolkit.exe -d 0:c -NV -fa -p c:\
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --ondemand-dump [or]
  DCToolkit.exe -d 0:c -NV -de
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --ondemand-dump --path c:\ [or]
  DCToolkit.exe -d 0:c -NV -de -p c:\
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --PLP-log [or] DCToolkit.exe -d 0:c -NV -plp
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --PLP-log --path c:\ [or]
  DCToolkit.exe -d 0:c -NV -plp -p c:\
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --snor-log [or] DCToolkit.exe -d 0:c -NV -snor
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --snor-log --path c:\ [or]
  DCToolkit.exe -d 0:c -NV -snor -p c:\
  DCToolkit.exe --disk 0:c --nvme-vendor-utility --optionrom-download /path/optionrom.bin [or]
  DCToolkit.exe -d 0:c -NV -od /path/optionrom.bin

Sub Options:
     -d [ --disk               ] Disk-Number of the disk to execute VU feature.
    -fa [ --falog-dump         ] Extract the log data from a coreview block of the SSD.
    -de [ --ondemand-dump      ] Extract the Ondemand Dump from the SSD.
   -plp [ --PLP-log            ] Enables the user to extract the PLP log data from a coreview bl
                                 ock of the SSD.
    -od [ --optionrom-download ] Download optionrom binary.
  -snor [ --snor-log           ] Extract the SNOR Log from the SSD.
     -p [ --path               ] Output path to make output file
------------------------------------------------------------------------------------------------
```

	Commands
Arguments	-fa [--falog-dump] Extract the log data from a core view block of the SSD. -plp [--PLP-log] Enables the user to extract the PLP log data from a core view block the SSD. -od [--optionrom-download] Download Option rom binary download -snor [--snor-log] Extract the log data from SNOR of the SSD -de [--ondemand-dump] Extract the dump from the SSD at the time the user requests -p [--path] Set the path for saving the Log data
Used with	--disk [or] -d
Usage	DCToolkit --disk 1:c --nvme-vendor-utility --falog-dump (--path C:\) DCToolkit --disk 1:c --nvme-vendor-utility --PLP-log (--path C:\) DCToolkit --disk 1:c --nvme-vendor-utility --optionrom-download /path/optionrom.bin DCToolkit --disk 1:c --nvme-vendor-utility --snor-log (--path C:\)

	DCToolkit --disk 1:c –nvme-vendor-utility --ondemand-dump (--path C:\) [or] DCToolkit -d 1:c -NV –fa (-p C:\) DCToolkit -d 1:c -NV –plp (-p C:\) DCToolkit -d 1:c -NV –od /path/optionrom.bin DCToolkit -d 1:c -NV -snor (-p C:\) DCToolkit –d 1:c -NV -de (-p C:\)

-NV [--nvme-vendor-utility]

```
-------------------------------------------------------------------------------------------
Usage:
  DCToolkit.exe  -HM [ --health-monitor ] [parameter-list] -d [diskindex]

Example:
  DCToolkit.exe --health-monitor --list --path {directory-path}
  [or]
  DCToolkit.exe -HM -L -p {directory-path}

  DCToolkit.exe --health-monitor --extract --path {directory-path}
  DCToolkit.exe --health-monitor --extract --path {directory-path} --disk {disk-index}
  [or]
  DCToolkit.exe -HM -E -p {directory-path}
  DCToolkit.exe -HM -E -p {directory-path} -d {disk-index}

  DCToolkit.exe --health-monitor --analyze --path {directory-path}
  DCToolkit.exe --health-monitor --analyze --path {directory-path} --disk {disk-index}
  [or]
  DCToolkit.exe -HM -A -p {directory-path}
  DCToolkit.exe -HM -A -p {directory-path} -d {disk-index}

  DCToolkit.exe --health-monitor --all --path {directory-path}
  DCToolkit.exe --health-monitor --all --path {directory-path} --disk {disk-index}
  [or]
  DCToolkit.exe -HM -all -p {directory-path}
  DCToolkit.exe -HM -all -p {directory-path} -d {disk-index}

  DCToolkit.exe --health-monitor --smart --path {directory-path}
  DCToolkit.exe --health-monitor --smart --path {directory-path} --disk {disk-index}
  [or]
  DCToolkit.exe -HM -S -p {directory-path}
  DCToolkit.exe -HM -S -p {directory-path} -d {disk-index}

  DCToolkit.exe --health-monitor --nvme-smart --path {directory-path}
  DCToolkit.exe --health-monitor --nvme-smart --path {directory-path} --disk {disk-index}
  [or]
  DCToolkit.exe -HM -NS -p {directory-path}
  DCToolkit.exe -HM -NS -p {directory-path} -d {disk-index}

  DCToolkit.exe --health-monitor --nvme-extended-smart --path {directory-path}
  DCToolkit.exe --health-monitor --nvme-extended-smart --path {directory-path} --disk {disk-index}
  [or]
  DCToolkit.exe -HM -NES -p {directory-path}
  DCToolkit.exe -HM -NES -p {directory-path} -d {disk-index}

Sub Options:
    -d [ --disk                ] Disk-Number of the disk to execute Health Monitor feature.
    -L [ --list                ] Shows disks attached to the system.
    -E [ --extract             ] Extract the values from the device.
    -A [ --analyze             ] Analyze the devices attached on system.
  -all [ --all                 ] Execute ALL Health Monitor features.
    -S [ --smart               ] Shows SMART values of specified disk
   -NS [ --nvme-smart          ] Display Log Pages(NVMe SMART) on specified NVMe disk.
  -NES [ --nvme-extended-smart ] Display Log Pages(NVMe Extendted SMART) on specified NVMe disk
    -p [ --path                ] The directory path to save the results of this feature.
-------------------------------------------------------------------------------------------
```

-HM[--health-monitor] comprehensively observe the health status of the target drive and report the risk level of the device as RISK_LOW, RISK_MEDIUM, RISK_HIGH. Every result from tool execution is output as the format of Jason file and the specific function is as follows;

Format of JSON files

DEVICE_INFO : Output basic information of a Device

AnalyzeSupport : –A[--analyzer] function support among health monitor functions Firmware Location: Product production location ModelName Month: Product production month SerialNumber Year: Product production year

DEVICE_LIST

Display for each functional output

TOOL_INFO

Build Date : DC Toolkit build date Elapsed Time(sec): Health monitor function execution time Error Information: Health monitor error type display during function execution In the case of “N/A”, it means no error occurred Execution Time: The date of health monitor function execution Status: When displayed Success or Fail, specific error type is displayed for error Information if failed Tool Version

- -L[--list]: Basic information of every device connected to system is saved as yyyymmdd_hhmmss_magicnumber_DiskList.json format. Unique disk number of drive and its analyzer function supportablilty, firmware, manufacturing site, model number, production month and year and serial number is recorded in the output log. And the tag called TOOL_INFO is logged as output at the last step.
- -E[--extract]: The log is created as yyyymmdd_hhmmss_magicnumber_EXTRACT_serial.json format file by extracting DSLR data.
- -A[--analyze]: By analyzing SMART, Extended SMART and DSLR of the target drive comprehensively, it decides the the risk level of the device and creates yyyymmdd_hhmmss_magicnumber_ANALYZE_serial.json format file. It specifically shows ASSERT infomation, DWPD, INTERFACE, MEDIA, PERFORMANCE_DROP, SILENT and TANTAL, THERMAL information of the target drive and finally make log with the name tag of SUMMARY which shows the abnormal status of information for the drive.
- -HM –A(analyze) command is only supported in Microsoft, AWS, General OEM products.
- -S[--smart]: it is a restricted function for SATA device and save the SMART of SATA drive as json format.
- -NS[--nvme-smart]: it is a restricted function for NVMe device and save the SMART of NVMe drive as json format.
- -NES[--nvme-extended-smart]: Specially, it saves the extended SMART value for MSFT as json format.
- -all[--all]: It executes every detailed function except list.

	Commands
Arguments	-L [--list] Basic information of every device connected to system -E [--extract] extracting DSLR data. -A [--analyze] it decides the risk level of the device -S [--smart] SMART value -NS [--nvme-smart] NVMe SMART value -NES [--nvme-extended-smart] NVMe extended SMART value -all[--all] executing every HM feature except -L
Used with	
Usage	DCToolkit --health-monitor --list --path ./ DCToolkit --health-monitor --extract --path ./ (--disk 1 or 1:c) DCToolkit --health-monitor --analyze --path ./ (--disk 1 or 1:c) DCToolkit --health-monitor --smart --path ./ (--disk 1) DCToolkit --health-monitor --nvme-smart --path ./ (--disk 1:c) DCToolkit --health-monitor --nvme-extended-smart --path ./ (--disk 1:c) DCToolkit --health-monitor --all --path ./ (--disk 1 or 1:c) [or] DCToolkit -HM -L -p ./ DCToolkit -HM -E -p ./ (-d 1 or 1:c) DCToolkit -HM -A -p ./ (-d 1 or 1:c) DCToolkit -HM -S -p ./ (-d 1) DCToolkit -HM -NS -p ./ (-d 1:c) DCToolkit -HM -NES -p ./ (-d 1:c) DCToolkit -HM -all -p ./ (-d 1 or 1:c)

Reference Output

```
./20170711_09h44m27s_1362859_DiskList.json
```

<Get device list>

```
./20170711_09h44m44s_1380218_EXTRACT_S361NX0H500015.json
./20170711_09h44m44s_1380234_EXTRACT_S361NX0H500008.json
./20170711_09h44m44s_1380265_EXTRACT_S2UHNX0H400371.json
./20170711_09h44m44s_1380296_EXTRACT_S2UHNX0H400294.json
./20170711_09h44m44s_1380312_EXTRACT_0123456789ABCDEF0000.json
```

<Get extract data>

```
./20170711_09h45m08s_1403843_ANALYZE_S361NX0H500015.json
./20170711_09h45m10s_1405859_ANALYZE_S361NX0H500008.json
./20170711_09h45m10s_1406015_ANALYZE_S2UHNX0H400371.json
./20170711_09h45m10s_1406187_ANALYZE_S2UHNX0H400294.json
./20170711_09h45m10s_1406218_ANALYZE_0123456789ABCDEF0000.json
```

<Get analyze data>

```
./20170711_09h45m23s_1419406_SMART_S361NX0H500015.json
./20170711_09h45m23s_1419437_SMART_S361NX0H500008.json
```

‹Get SATA SMART data›

```
./20170711_09h45m37s_1433093_SMART_S2UHNX0H400371.json
./20170711_09h45m37s_1433140_SMART_S2UHNX0H400294.json
./20170711_09h45m37s_1433156_SMART_0123456789ABCDEF0000.json
```

‹Get NVME SMART data›

```
./20170711_09h45m49s_1445328_ExtendedSMART_S2UHNX0H400371.json
./20170711_09h45m49s_1445375_ExtendedSMART_S2UHNX0H400294.json
./20170711_09h45m49s_1445390_ExtendedSMART_0123456789ABCDEF0000.json
```

‹Get NVMe Extended SMART data›

```
./20170711_09h46m04s_1459687_SMART_S361NX0H500015.json
./20170711_09h46m04s_1459718_SMART_S361NX0H500008.json
---
./20170711_09h46m04s_1459750_SMART_S2UHNX0H400371.json
./20170711_09h46m04s_1459796_SMART_S2UHNX0H400294.json
./20170711_09h46m04s_1459812_SMART_0123456789ABCDEF0000.json
---
./20170711_09h46m04s_1459843_ExtendedSMART_S2UHNX0H400371.json
./20170711_09h46m04s_1459875_ExtendedSMART_S2UHNX0H400294.json
./20170711_09h46m04s_1459890_ExtendedSMART_0123456789ABCDEF0000.json
---
./20170711_09h46m04s_1459921_EXTRACT_S361NX0H500015.json
./20170711_09h46m04s_1459937_EXTRACT_S361NX0H500008.json
./20170711_09h46m04s_1459968_EXTRACT_S2UHNX0H400371.json
./20170711_09h46m04s_1460000_EXTRACT_S2UHNX0H400294.json
./20170711_09h46m04s_1460031_EXTRACT_0123456789ABCDEF0000.json
---
---
./20170711_09h46m16s_1472171_ANALYZE_S361NX0H500015.json
./20170711_09h46m17s_1473343_ANALYZE_S361NX0H500008.json
./20170711_09h46m17s_1473515_ANALYZE_S2UHNX0H400371.json
./20170711_09h46m18s_1473703_ANALYZE_S2UHNX0H400294.json
./20170711_09h46m18s_1473734_ANALYZE_0123456789ABCDEF0000.json
---
```

Examples

This chapter explains the details of the features along with the Command Terminal Input and screenshots of the respective features.

Display History of Commands

The Command history table can be displayed using the -C or --command-history command line option. Maximum of 500 command history will be displayed:

```
DCToolkit --command-history
or
DCToolkit –C
```

Display Tool Help

The help table can be displayed using the --help command line option:

```
DCToolkit –help
or
DCToolkit -H
```

Display Disk List

The -L or --list option will display a list of Samsung SSDs which shows the Model Name, Firmware version, Capacity, Disk Heath, TBW etc.

```
DCToolkit --list
or
DCToolkit -L
```

Identify Information of the Disks

```
DCToolkit --disk 0 --identify (--path [output path])
DCToolkit --disk 0:c --identify (--path [output path])
DCToolkit --disk A --identify (--path [output path])
or
DCToolkit -d 0 -ID (-p [output path])
DCToolkit -d 0:c -ID (-p [output path])
DCToolkit –d A –ID (-p [output path])
```

SMART Information of the Disks

This feature is used to select a specific disk connected to the system and get the SMART value of the disk. This feature will also log the temperature of the SSD and display the estimated life time of the SSD and the percentage of the available LBA to replace.

The below Command Line option will perform the SMART operation:

```
DCToolkit --disk 1 --smart
DCToolkit --disk 1 --smart --temperature                    (use default location)
DCToolkit --disk 1 --smart --temperature /home/     (store the file in /home/)
DCToolkit --disk 1 --smart --query
DCToolkit --disk 1 --smart --execute --offlineshort
DCToolkit --disk 1 --smart --execute --offlineextended
DCToolkit --disk 1 --smart --execute --offlineselective
DCToolkit --disk 1 --smart --execute --captiveshort
DCToolkit --disk 1 --smart --execute --captiveextended
DCToolkit --disk 1 --smart --execute --captiveselective
DCToolkit --disk 1 --smart --execute --abort
DCToolkit --disk 1 --smart --execute --checkstatus

DCToolkit --disk 1:c --nvme-get-log-pages --error {count}
DCToolkit --disk 1:c --nvme-get-log-pages --smart
DCToolkit --disk 1:c --nvme-get-log-pages --smart-extended
DCToolkit --disk 1:c --nvme-get-log-pages --firmware
DCToolkit --disk 1:c --nvme-get-log-pages --temperature
DCToolkit --disk 1:c --nvme-get-log-pages --lifetime
or
DCToolkit -d 1 -S
DCToolkit -d 1 -S -t                    (use default location)
DCToolkit -d 1 -S -t /home/         (store the file in /home/)
DCToolkit -d 1 -S -q
DCToolkit -d 1 -S -e --offlineshort
DCToolkit -d 1 -S -e --offlineextended
DCToolkit -d 1 -S -e --offlineselective
```

```
DCToolkit -d 1 -S -e --captiveshort
DCToolkit -d 1 -S -e --captiveextended
DCToolkit -d 1 -S -e --captiveselective
DCToolkit -d 1 -S -e --abort
DCToolkit -d 1 -S -e –checkstatus
DCToolkit -d 1:c -NG -e {count}
DCToolkit -d 1:c -NG –s
DCToolkit -d 1:c -NG –se
DCToolkit -d 1:c -NG -f
DCToolkit -d 1:c -NG -t
DCToolkit -d 1:c -NG -l
```

Note: If no file path is provided to -t command, temperature is logged in the file located at %appdata%DCToolkit/SMARTFiles/. Filename would be Log_Temperature.txt.

The default locations for Smart temperature logging files are:

To execute the SMART Self-Test, run -e command with appropriate sub option. If --offlineshort, --offlineextended, --offlineseletive option selected, it will be stopped by --abort option. Its progress can be displayed with --checkstatus option. If --captiveshort, --captiveextended, --captiveselective option selected, it is impossible to escape the execution during the estimated time.

Firmware Update

This feature is useful for changing SSD's firmware from old version to new version.

The below given CLI input will perform the firmware update operation on the selected disk:

```
DCToolkit --disk 1 --firmware-update --path <fw-path>
DCToolkit --disk 1:c --nvme-firmware-download --path <fw-path> --action 1 --slot 2
DCToolkit --disk A --firmware-update --path <fw-path> --source <target FW>
or
DCToolkit -d    1 -F -p    <fw-path>
DCToolkit -d 1:c -ND –p <fw-path> –a 1 –s 2
DCToolkit –d A –F –p <fw-path> -s <target FW>
```

Erase

Erase feature is designed to remove all user data from a drive permanently. This command will put the drive back to its original out-of-box state. This will initially restore its performance to the highest possible level and the best (lowest number) possible write amplification.

The below given CLI input will perform the erase operation on the selected disk:

```
DCToolkit --disk 1 --erase
DCToolkitD --disk 1:c --nvme-format-namespace --user-data-erase
DCToolkitD --disk 1:c --nvme-format-namespace --cryptographic-erase
or
DCToolkit -d 1 –E
DCToolkitD -d 1:c -NF -ue
DCToolkitD -d 1:c -NF –ce
```

Note: When the disk is in frozen state, the user has to unplug and plug-in the power cable and restart the erase operation.

Write amplification is an issue that occurs in SSDs that can decrease the lifespan of the SSD and impact performance. The lower the write amplification, the longer will be the lifespan of SSD.

Set Max Address

This feature is for setting maximum address of the SSD. The user has to input the number of sectors in decimal format. This feature is designed to set the physical capacity of SSD. This feature is only recommended to be used on the device at its initial set-up stage. In contrast to over-provisioning modifying max address may result in data loss, particularly when the max address is reduced.

This feature will update the disks capacity with user input value, only if it is successful in reading the max address value of the disk. After successful execution, the updated value of the disk can be observed in --list command.

```
DCToolkit --disk 1 --setmax --set 12345678
DCToolkit --disk 1 --setmax --read-native-max
DCToolkit --disk 1:c --nvme-management-namespace --set-lba 900000000
or
DCToolkit -d 1 -M -s 12345678
DCToolkit -d 1 -M –r
DCToolkit -d 1:c -NM –sl 900000000
```

Disk Info

This feature will display disk details such as Overprovision, Write Cache state, Max address value, SCT Write Cache state, WWN, Phy Speed, current Power Mode, etc. of the specified disk.

```
DCToolkit --disk 1 --info
or
DCToolkit -d 1 –I
```

Bypass confirmation prompt (--force)

The --force option is used to bypass the confirmation prompt for --erase, --trim and --firmware-update features.

```
DCToolkit --disk 1 --erase --force
DCToolkit --disk 1 --firmware-update --path <filepath> --force
DCToolkit –disk 1:c --nvme-format-namespace --user-data-erase --force
DCToolkit --disk 1:c --nvme-format-namespace --cryptographic-erase --force
DCToolkit –disk 1:c --nvme-management-namespace --set-lba 900000000 --force
DCToolkit –disk 1:c --nvme-firmware-download --path {path} --action 1 --slot 2 --force
```

SCT Command

```
DCToolkit --disk 1 --sct --writesame-pattern-background 0x0:0x10:0xFF00FF00
DCToolkit --disk 1 --sct --writesame-pattern-foreground 0x0:0x10:0xFF00FF00
DCToolkit --disk 1 --sct --writecache-get
DCToolkit --disk 1 --sct --writecache-set 1
DCToolkit --disk 1 --sct --writecache-set-non-volatile 1
DCToolkit --disk 1 --sct --reordering-get
DCToolkit --disk 1 --sct --writecache-set 1
DCToolkit --disk 1 --sct --writecache-set-non-volatile 1
DCToolkit --disk 1 --sct --temperature-logging-get
DCToolkit --disk 1 --sct --temperature-logging-set 0x1
DCToolkit --disk 1 --sct --temperature-history
 [or]
DCToolkit -d 1 –X -wb 0x0:0x10:0xFF00FF00
DCToolkit -d 1 –X –wf 0x0:0x10:0xFF00FF00
DCToolkit -d 1 –X -xg
DCToolkit -d 1 –X -xs 1
DCToolkit -d 1 –X -xsnv 1
DCToolkit -d 1 –X -rg
DCToolkit -d 1 –X -rs 1
DCToolkit -d 1 –X -rsnv 1
DCToolkit -d 1 –X -lg
DCToolkit -d 1 –X -ls 0x1
DCToolkit -d 1 –X -t
```

Vendor Utility

This feature will perform Vendor Utility features such as:

Get the FA-log-dump data

```
DCToolkit --disk 1 --vendor-utility --FAlog-dump (--path [output path])
DCToolkit --disk 1:c --nvme-vendor-utility --FAlog-dump (--path [output path])
DCToolkit --disk 1 --vendor-utility --PLP-log (--path [output path])
DCToolkit --disk 1:c --nvme-vendor-utility --PLP-log (--path [output path])
DCToolkit --disk 1 --vendor-utility --DSLR (--path [output path])
DCToolkit --disk 1:c --nvme-vendor-utility --snor-log (--path [output path])
DCToolkit --disk 1:c –nvme-vendor-utility --ondemand-dump (--path [output path])
 [or]
DCToolkit -d 1 -V -fa (-p [output path])
DCToolkit -d 1:c -NV -fa (-p [output path])
DCToolkit -d 1 -V –plp (-p [output path])
DCToolkit -d 1:c -NV –plp (-p [output path])
DCToolkit -d 1 -V -dslr (-p [output path])
DCToolkit -d 1:c -NV -snor (-p [output path])
DCToolkit -d 1:c -NV –de (-p [output path])
```

Health Monitor

```
DCToolkit –health-monitor --list --path [output path]
DCToolkit –health-monitor --extract --path [output path] (--disk 1)
DCToolkit –health-monitor --analyzer --path [output path] (--disk 1)
DCToolkit –health-monitor --all --path [output path] (--disk 1)
DCToolkit –health-monitor --nvme-smart --path [output path] (--disk 0:c)
DCToolkit –health-monitor --nvme-extended-smart --path [output path] (--disk 0:c)
Or
DCToolkit –HM –L –p [output path]
DCToolkit –HM –E –p [output path] (-d 1)
DCToolkit –HM –A –p [output path] (-d 1)
DCToolkit –HM –all –p [output path] (-d 1)
DCToolkit –HM –NS –p [output path] (-d 0:c)
DCToolkit –HM –NES –p [output path] (-d 0:c)
```

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