



User Guide

Storage Executive

Introduction

This guide describes how to install and use Storage Executive to monitor and manage Micron solid-state drives (SSDs).

Storage Executive provides the ability to:

- View all drives installed in a system and see current drive status and capacity, temperature, firmware version, and driver information.
- View SMART attributes.
- Update firmware.
- Remove all data from a drive by performing a sanitize, format drive, or physical security ID (PSID) revert operation.
- Enhance burst performance by enabling the Momentum Cache feature.
- Improve drive performance and endurance by allocating over-provisioning capacity.
- Increase drive endurance by setting Flex Capacity (supported drives only).
- Perform a drive self-test.
- Create or delete namespaces.

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1



Table of Contents

Storage Executive	1
Introduction	1
Installing and Starting Storage Executive	3
Installation	5
Starting Storage Executive	5
Stopping and Exiting Storage Executive	5
Obtaining Help	5
Updating Storage Executive	6
Using Storage Executive	7
Management Options	7
System Information	8
Detected Drives	8
Refreshing Information	10
Selecting a Drive	10
Viewing and Saving Drive Details	12
Viewing Basic Information	12
Viewing Drive Performance and Optimization	13
Viewing SMART Thresholds	14
Saving Drive Debug Data	15
Removing a Drive (PCIe Drives Only)	16
Displaying SMART Attributes	17
Performing a Firmware Update	
Checking for Firmware Updates	18
Systems Behind a Proxy Server	19
Updating Firmware	19
Manually Updating Firmware	20
Erasing a Drive	21
Performing a Sanitize Drive Operation	21
Performing a Format Drive Operation	22
Performing a PSID Revert Operation	23
Before You Begin	24
Running PSID Revert	24
Configuring Linux Systems to Perform a PSID Revert Operation	25
Enabling or Disabling Momentum Cache	27
Setting Over-Provisioning Capacity	
Enabling Over-Provisioning	28
Disabling Over-Provisioning	29
Setting Flex Capacity	30
Setting Capacity	30
Returning to Native Drive Capacity	31
Running Device Self-Test	
Managing Namespaces	33
Creating a Namespace	33
Deleting a Namespace	33
Revision History	



Installing and Starting Storage Executive

Storage Executive supports the SSDs listed below. Install Storage Executive on each system containing the SSD(s) you want to manage.

Table: 1 System Requirements

Requirement	Description		
Micron SSD	SATA SSDs:	NVMe™ SSDs:	SAS SSDs
	• 5400	• 2100AI, 2100AT	• \$610DC
	5300 Series	• 2200	• \$630DC
	• 5210	• 2210	• \$650DC
	5200 Series	• 2300	• \$655DC
	5100 Series	• 2400	
	• 1300	• 2450	
	• 1100	• 2550	
	• M500	• 3400	
	• M500DC	• 3460	
	• M500IT	• 3500	
	• M510	• 4150	
	• M510DC	• 6400ZNS	
	• M550	• 6500ZNS	
	• M600	• 6500ION	
	• P400M	• 7100 Series	
		• 7300 Series	
		• 7400 Series	
		• 7450 Series	
		• 7500PRO 7500MAX	
		• 9100 Series	
		• 9200 Series	
		• 9300 Series	
		• 9400 Series	
		• 9500.Series	
		• P7	



Table: 2 Supported OS

Description
Microsoft Windows Server [®] 2022
Microsoft Windows Server [®] 2019, 2016
 Windows[®] 11 (x64)
• Windows [®] 10 (x64)
 Red Hat[®] Enterprise Linux[®] version 7.0 or later
SUSE [®] Linux Enterprise Desktop 12, 11
Ubuntu [®] Desktop 18.04 LTS or later
CentOS 7.x or later
Fedora 14 and later
Debian 11 and later
Rocky Linux 9.0 and later

Table: 3 NVMe Driver Support

Driver	Description
Micron Windows NVMe driver	For all supported versions of Windows, supports all Storage Executive features
Inbox Microsoft Windows 10 and Windows 11 NVMe driver	Supports all Storage Executive features except: -Configure Power Management feature for an NVMe drive -Perform format namespace operation
Linux inbox NVMe driver	Supports all Storages Executive features when drive is configured through Linux inbox driver
The Intel® Rapid Storage Technology (Intel® RST) driver	Supports limited storage executive features when drive is configured with IRST driver

Table: 4 RAID Controller Support

RAID Controller	Details
Avago MegaRAID, Smart HBA, Microchip Smart RAID, Smart Array Controllers	Drives connected to MegaRAID controllers appear with the following device name, where X indicates the ID of the MegaRAID controller and Y indicates the ID of the drive behind the controller: mraidX:Y



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Installation

- 1. Download Storage Executive from micron.com.
- 2. Run the installation file:
 - i) Windows: Storage-Executive-setup.exe
 - ii) Linux: Storage-Executive-setup.run
- 3. Follow the instructions on the screen.
- 4. Click Finish when the installation completes.

Starting Storage Executive

In Windows:

- 1. Open the Windows Start menu.
- 2. Click All Programs > Micron Storage Executive > Micron Storage Executive.

In Linux:

- 1. Navigate to /opt/Micron Technology/Micron Storage Executive.
- 2. Run the following command: ./Storage Executive Client.run

When Storage Executive starts, the System Information screen appears.

Stopping and Exiting Storage Executive

To stop and exit Storage Executive, click the **X** in the upper right window of the application.

Obtaining Help

For help or additional information while using Storage Executive, click the Help link.

To contact customer support, click the **Support** link and enter the requested information.

For a list of global SSD support websites, click the About link and select SSD Support Website.



Updating Storage Executive

To view the version of Storage Executive installed on the system, click the **About** link.

When a new version of the software becomes available, a notice automatically appears above the management options.

Fig: 1 Storage Executive GUI

•			🥑 Help 🕤 About 🖾 Si	upport (English)
	Storage E	excutive		
NEW!	DESKTOP-IEAV	PPB ws 10 Pro (build 19042), 64-bit		S
Version 7.12.122021.04 is available. You are currently on version 7.01.012021.05.	Physical	Memory	Virtual Memory	
Upgrade Now	0 2.54	GB 5.95	2.58GB 6.95	
A System Information	Drive6 - Good F Micron_5200_MTFDDAJ	Health K480TDC	dt S	M.A.R.T.
Drive Details	Serial Number:	Firmware Revision:	Latest Firmware Installed	
JII S.M.A.R.T.	1853219813C6	D1MU030		-
L Firmura Hadata	30%	Current I	emperature (in Ceisius)	



Using Storage Executive

At startup, Storage Executive detects all supported Micron SSDs installed in the system as well as standard hard drives and third-party SSDs.

The System Information screen appears and displays:

- Management options
- System information
- All detected drives and their status

Fig: 2 System Information

A System Information		DESKTOP-NTOB7TR 10.70.49.207 - Windows 10 Ente	rprise (build 17763), 64-b	bit.	0
E Drive Details	>	Physical Memory		Virtual Memory	
III S.M.A.R.T.	>				
⊥ Firmware Updates	>	4.37GB		5.4GB	1
Sanitize Drive	>				
O Format Drive	>	Drive2 - Good Health Micron_5100_MTFDDAK480TCB			I SMART.
PSID Revert		Serial Number: 18281EA4CAEE	Firmware Revision: D0MU064	Latest Firmware I	nstalled
Y Momentum Cache	>	Drive Capacity: 480.00 GB		Current Temperature (in Celsius)	
E Flex Capacity	>		100%	33.)	
III Over Provisioning	>	Drive3 - Good Health			ISMART.
I [■] Device Self-Test	>	Serial Number;	Firmware Revision:	Latest Firmware I	nstalled
Amespace Managem	ent	1916E1FB523B	M3CR023		
		Drive Capacity: 250.00 GB		Current Temperature (in Celsius)	

Management Options

Options for managing a drive appear on the left side of the screen. Options available may vary depending on the type and model of drive(s) installed in the system:

- System Information
- Drive Details
- SMART
- Firmware Updates
- Sanitize Drive
- Format Drive
- PSID Revert
- Momentum Cache
- Flex Capacity
- Over-Provisioning
- Device Self-Test
- Namespace Management



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System Information

General system information appears at the top of the screen:

- System details: Hostname, IP address, and installed operating system.
- Physical memory: Amount of memory installed in the system.
- Virtual memory: Amount of virtual memory configured in the system.

Detected Drives

All drives installed in the system appear in the lower portion of the screen.

Information displayed depends on the type and model of drive(s) detected:

- Drive status: Overall status of the drive (Table 4).
- **Drive number and name:** Name and number assigned to the drive. Click on the drive number to view the driver's details.
- Serial number: Manufacturing serial number of the drive.
- **Firmware availability:** Indicates if a new version of firmware is available for the drive. This information is not available for standard hard drives or third-party SSDs.
- **Current temperature:** Current operating temperature of the drive as reported by the SMART temperature attribute. This information is not available for standard hard drives or third-party SSDs.
- Drive capacity: Percentage of drive capacity used out of total capacity.
- **SMART button:** Click to view the drive's Self-Monitoring, Analysis, and Reporting Technology (SMART) attributes.

The order of the drives displayed on the screen is determined by the status of each drive. Drives with errors or warnings appear before drives that are functioning properly (with no errors).



Table: 4 Drive Status

Drive Status	Description
Drive3 - Good Health Micron_M550_EEFDDAK512MAY	Good Health Drive is operating properly (no errors).
Drive3 - Busy Micron_M550_EEFDDAK512MAY	Busy Drive is busy with an operation. This is a temporary state and occurs when a long-running operation is in progress.
Drive6 - Sanitize In Progress Micron_M600_EEFDDAK512MAY	Sanitize In Progress Sanitize drive operation is in progress.
Drive5 - Near TBW Micron_M600_EEFDDAK512MAY	Near TBW/Has Met TBW Drive is nearing or has met its limit for total bytes written (TBW). The drive will continue to operate normally; however, it is recommended to back up all drive data to an alternate storage device and replace the drive as soon as possible.
Drive4 - Nearing Write Protect Micron_M500_EEFDDAK512MAY	Nearing Write Protect Drive is approaching the end of its lifespan and will soon enter write protect (read-only) mode. It is recommended to back up all data to an alternate storage device and replace the drive as soon as possible.
Drive4 - Exceeded SMART Threshold Micron_M600_MTFDDAK1T0MBF	SMART Threshold Exceeded One or more SMART threshold values has been exceeded on the drive.
Drive3 - In Write Protect Micron_M550_EEFDDAK512MAY	In Write Protect Drive has reached the end of its lifespan and is in write protect (read-only) mode. Any pending data should be saved to an alternate storage device and the drive replaced as soon as possible.
Drive4 - In Fault State Micron_M500_EEFDDAK512MAY	In Fault State Drive is in a faulty state, which could result in unreliable behavior (drive operations may fail or drive information may no longer be available). Contact Micron support on the Contact Support page.
(dev/nvme0 - Attention! Drive is in Panic State! EEFDKCC1T9QFR	Drive is in With Drive in panic state, Only limited functionalities supported on the drive



Refreshing Information

Click the **Refresh** icon in the upper right corner of the screen to refresh detected drives and drive information.

Selecting a Drive

Select a drive using one of two methods:

- Click on a drive number to view the drive's details. (Fig: 3)
- Click a management option and then select a drive to manage. (Fig: 4)

Fig: 3 Selecting a Drive for Details

DESKTOP-A0BL521 10.102.28.200 - Windows 10 Ente	rprise (build 16299), 64	bit	0
Physical Memory		Virtual Memory	Y
2.96GB 7.86		са с	12
Drive0 - Good Health			JI SMART
Serial Number: 00000000133102058AC7	Firmware Revision: MU02	Latent Formware	Installed
Drive Capacity: 128.00 GB	_	Current Temperature (in Celsius)	
Serial Number: 163413CF06F7	Firmware Revision: M0MU031	🛋 Latest Firmward	dt SMART
Drive Capacity: 512.00 GB		Current Temperature (in Celsius)	
Drive2 - Good Health Micron_M5100_EEFDDAK240TCB			JI SMART
Serial Number. 16311389B773	Firmware Revision: D0MU027	L New Finnesee Revision: DDM	Numitable UCS7
Drive Capacity: 240.00 GB		Current Temperature (in Colsius)	



Fig: 4 Selecting a Drive to Manage

A System Information		PLEASE SELECT & DRIVE	OOJB8 Jose 10 Pro (build 17763), 64-bit		C
E Drive Details	>	CT250MR850F33D4	el Memory	Virtual Memor	y
di SMART	, 🤇	Marine 192522662E.637 Marine 2100AL EEF2HEATTOTTE	2		
L Firmware Updates	>		7.17G8	7.8368	15.24
Sanitize Drive	>	-			
₫+ PSID Revent		Drive0 - Gov	od Health		ASMART
Y Momentum Cache		Serial Number	Fernware Revision	Latert Fernever	e buitatod
E Flex Capacity		Drive Capacity: 250.00 GB		Current Temperature (in Celsius)	
II Over Provisioning	>				
P Device Self-Test		wtinyme193	2522662EB7 - Good Health		ASMART
Namespace Management		Sertal Number 192522662EB7	Fernivare Revision. MU01	Timusan NOT	Arglathe
		Drive Capacity: 1.62 TB		Current Temperature (in Celolus)	



Viewing and Saving Drive Details

The Drive Details screen provides various information about a selected drive, including:

- Basic information such as capacity, interface, temperature, and driver versions.
- Performance and optimization information.
- SMART threshold alerts.
- Debug data including controller and OS information.

Viewing Basic Information

- Click a drive number on the System Information screen or click on the **Drive Details** menu and select a drive.
- Then drive's details will appear.

Fig: 5 Drive Details

🚔 Get Debug Data	Micron_5100_EEFDDAK980TCC		
Drive Us	age	Temperature	
, OGB	Deca	27° Celsius	121
Serial Number:	160913A4248C	SATA Information:	
Total Capacity:	960.00 GB	SATA Interface:	SATA 6.0Gb/ (SATA 3)
Available Capacity:	960.00 GB		
Total Bytes Written:	7.26 TB		
Driver Version:	10.0.16299.461 (Standard SATA AHCI Controller)		
Firmware Revision:	F0BN0183	Latest Firmware Installed	

Note: The drive capacity reported by Storage Executive may vary from the capacity reported by the operating system. Storage Executive reports 1KB as 1000bytes. Most operating systems report 1KB as 1024 bytes.

Also note:

- Drive capacity (Drive Usage gauge) does not appear for drives behind a RAID controller.
- If a drive does not contain partitions, the entire drive is reported as available.
- If a drive does contain a partition but the partition is not mounted, the entire partition is reported as unavailable.
- If a drive contains a partition and the partition is mounted, the portion that is used is reported as unavailable while the remaining portion is reported as available.
- Click the **Refresh** button to refresh the information.



Viewing Drive Performance and Optimization

If the selected drive can be optimized for performance, information appears at the top of the Drive Details screen describing what action(s) can be taken.

Note: This information varies and only appears if the selected drive is not meeting a performance or optimization condition.

Fig: 6 Performance and Optimization Information

Drive Usage	Temperature
\cap	1
964.04GB	30° Celsius
rformance and Optimization	
Disable Last Accessed Timestamp	A
Disabling the last accessed timestamp will reduce unnecess Get More Information	sary writes to the SSD, extending its life.
Disable 8.3 Filename Creation	A
Supporting legacy MS-DOS file-naming conventions will rec necessary, 8.3 filename creation should be disabled. • Get More Information	Juce performance of an NTFS volume. Unless absolutely
Enable AHCI Mode	
Your motherboard BIOS configuration is set to 'IDE' mode. berformance and to ensure full software feature support.	This configuration should be set to 'AHCI' mode for optimal
Default NVMe Driver In Use	<u>A</u>
Default NVMe Driver In Use You are currently using the default NVMe driver for this devi support, you should install the official vendor NVMe driver.	ce. For optimal performance and full software feature
Default NVMe Driver In Use You are currently using the default NVMe driver for this devi support, you should install the official vendor NVMe driver. Enable Windows Write-Cache Buffer Flushing	ce. For optimal performance and full software feature
Default NVMe Driver In Use fou are currently using the default NVMe driver for this devi support, you should install the official vendor NVMe driver. Enable Windows Write-Cache Buffer Flushing Vindows Write-Cache Buffer Flushing is disabled and there	ce. For optimal performance and full software feature



Viewing SMART Thresholds

If the selected drive exceeds Smart threshold, a warning appears at the top of the Drive Details screen with a list of SMART attributes.

Fig 7 Drive Details—SMART Threshold Exceeded:

· ·	Drive2 - Exceeded SMART Thre Micron_5200_EEFDDAK1T9TDC	eshold	
Exceeded SMART Thresholds:			
ID Descrip	tion		
5 Retired I	NAND Blocks		
170 Reserve	d block count		
Drive Us	age	Temperature	
0.24G	B 1920.0	o 27° Celsius	120
Performance and Optimi	zation		A
Supporting legacy MS-DOS in necessary, 8.3 filename crea > Get More Information	file-naming conventions will reduce perform tion should be disabled.	nance of an NTFS volume. Unle	ess absolutely
Serial Number:	174619A93C86	SATA Information:	_
Total Capacity:	1.92 TB	SATA Interface:	SATA 6.0Gb/s (SATA 3)
Available Capacity:	1.92 TB		
Total Bytes Written:	91.55 GB		
Driver Version:	10.0.16299.461 (Standard SATA AHCI Controller)		



Saving Drive Debug Data

Drive debug data can be useful when contacting customer support.

This information includes:

- Controller information (firmware logs, SMART data, and SMART logs).
- Drive information (serial number, model number, firmware version, drive status, and driver version).
- OS information (memory usage, kernel version, system interrupts, and CPU information).
- 1. Open the drop-down menu at the top of the Drive Details screen and select the **Get Debug Data** option.

The data is saved as a zip file in the Storage Executive installation directory, as noted at the top of the Drive Details screen.

- 2. You can send the debug data to Micron support by clicking the Yes, I want to send debug data button.
- 3. Click the **Get Debug Data** option multiple times to overwrite the .zip file with the latest information.

Fig: 8 Get Debug Data Option

C	-	-	Drive0 - Good Health	
\$	Get Deb	ug Data		

The get debug data of Technology Micron 3 Do you want to send of Yes, I want to send det	operation has Storage Exect debug data to bug data	i completed successfully. P utive\Drive2-debug-2018062 Micron Support for further as	lease get your file in C:\F 28-SN174619A93C86.zip sistance?	rogram Files\Micron	
0 -	V Dr	ive2 - Good Health pron_5200_EEFDDAK1T9TDC			
	Drive Usage			Temperature	
	0.24GB	1920.0	(28° Celsius	
Performance and	d Optimizat	ion			
Disable 8.3 Filen	ame Creatio	n			A
Supporting legacy in necessary, 8.3 filen a Get More Information	MS-DOS file-n name creation ation	aming conventions will reduc should be disabled.	e performance of an NTFS	s volume. Unless absolute	aly



Removing a Drive (PCIe Drives Only)

This section describes how to use Storage Executive to prepare a drive for physical removal from the system.

Note: This option is available only with hot-swappable PCIe drives.

- 1. Click on the **Drive Details** menu and select a drive.
- 2. Click the drop-down menu at the top of the screen and select Prepare for Removal.

Fig: 10 Prepare for Removal

Micron	Storage	Executive		
♠ System Information	C -	Drive0 - Good Health		
E Drive Details		MICTON_5100_MTPDDAK/161BY		
ılı S.M.A.R.T.	Drive	e Usage	Temperatu	re
L Firmware Updates	1			
Ø Sanitize Drive		OGB	29° Celsiu	s
⊗ Format Drive	o	800.0	0	120
PSID Revert	Serial Number:	182522EE35B1	SATA Information:	
▼ Momentum Cache >	Total Capacity:	800.00 GB	SATA Interface:	SATA 6.0Gb/s (SATA 3)
	Available Capacity:	800.00 GB		
	Total Bytes Written:	23.41 TB		
Over Provisioning	Driver Version:	10.0.19041.1889 (Standard SATA AHCI Controller)		
I- Device Sell-lest	Firmware Revision:	D0MH845	Latest Firmware Installed	



Displaying SMART Attributes

This section describes how to display the Self-Monitoring, Analysis, and Reporting Technology (SMART) attributes of a Micron SSD. SMART is a monitoring framework used to detect and report various indicators of consistency and anticipate failures.

- 1. Click on the **SMART** menu and select a drive.
- 2. The standard SMART attributes and attribute IDs for the selected drive appear.
- 3. Click the **Refresh** button to refresh the drive's SMART details.

For a customer-specific list of SMART attribute details, see the Client SSD SMART Attribute Reference Technical Note (TN-FD-22) available on <u>micron.com</u>, or contact your Micron customer representative.

If a drive exceeds a SMART attribute threshold, the status appears on the Drive Details screen.

Fig: 11 SMART Attributes

M IC ron	* Storage Executiv	ve
A System Information	C Drive0 - Goo	<i>d Health</i> FDDAK7T6TBY
Drive Details		
ili S.M.A.R.T. >	Current Firmware: D0MH845	
🛓 Firmware Updates 🔹 🗲	ID Description	Attribute Data Units
A Semiting Drive	1 Raw Read Error Rate	0 Errors/Page
Santize Drive	5 Reallocated NAND Block Count	0 NAND Blocks
S Format Drive	9 Power On Hours Count	427 Hours
	12 Power Cycle Count	128 Power Cycles
47 PSID Reven	170 Reserved Block Count	0 Bad Blocks
🔻 Momentum Cache 🔰	171 Program Fail Count	0 NAND Page Program Failures
	172 Erase Fail Count	0 NAND Block Erase Failures
E Flex Capacity	173 Block Wear-Leveling Count	3 Erases
Over Provisioning	174 Unexpected Power Loss Count	76 Unexpected Power Loss even
	180 Unused Reserved Block Count	91518 Blocks
Device Self-Test	183 SATA Interface Downshift	0 Downshifts
Namespace Management	184 Error Correction Count	0 Correction Events



Performing a Firmware Update

This section describes how to check for and perform firmware updates on supported drives.

Checking for Firmware Updates

To see if a firmware update is available, view the drive information on the System Information screen.

If your system has Internet access and is not behind a proxy server, Storage Executive detects and automatically displays the status of a drive's firmware version: Latest Firm- ware Installed, New Firmware Available, Update Firmware, or Firmware Not Available. For some drives, a Check Firmware button is available to manually check the status. For standard hard drives or third-party SSDs, firmware update is not available.



DESKTOP-A0BL521 10.102.28.200 - Windows 10 Ente	rprise (build 16299), 64	bit.	C
Physical Memory		Virtual Memory	
2.47GB 7.85		3.13GB 8.2	
V Drive0 - Good Health		di S	MART
Serial Number: 00000000133102058AC7	Firmware Revision: MU02	Latest Firmware Installed	
Drive Capacity: 128.00 GB		Current Temperature (in Celsius)	
V Drive1 - Good Health Micron_1109_MITFDDAK512TBN		dı S	MART
Serial Number: 163413CF06F7	Firmware Revision: M0MU031	Latest Firmware Installed	
Drive Capacity: 512.00 GB)	Current Temperature (in Celsius)	
V Drive2 - Good Health Moron_M5109_EEEDDAKS40TCB		di S	MART
Serial Number: 16311389B773	Firmware Revision: D0MU027	L New Firmware Austiable Revision: DOMU037	
Drive Capacity: 240.00 GB		Current Temperature (in Celsius)	_



Systems Behind a Proxy Server

If your system is behind a proxy server, set the proxy server information (on the System Information screen or the Firmware Update screen) to enable firmware update checks:

Fig: 13 Set Proxy Settings

Set Proxy	Settings			
If you are bet	ind a proxy please set the	HTTPS proxy hos	t and port here to get	online updates
1 100 010 001	and a prony, prease set me	in the president use	a dite polititere to get	chinic opacies.

Updating Firmware

Before performing a firmware update, save all work and close any applications that may be running.

NOTE: All drives in the system of the same model type are updated when you perform this operation.

- 1. Click the Firmware Updates menu and select a drive.
- 2. Review the information on the screen.
- 3. Click Update Firmware Now.
- 4. During the update, Storage Executive runs in an ISO environment. A reboot occurs automatically after the firmware is installed (Windows systems only).
- 5. After the firmware is updated, verify the new version by viewing the drive's details on the System Information screen.

Fig: 14 Update Firmware

Irmware updates, it is strongly rectly, there will be no loss of s	recommended that you backup or ma	ike copies of all important files before performing this
drive may not function proper- rer adapter.	ystern of user data of the onver now y. If this update is done on a notebool	ever, if the firmware process is interrupted for any k computer, it is strongly recommended that power be
e Update Available		
e firmware on each \$5100	OPRO drive in the system.	
rsion: D0MU417		Update Firmware Now
Date: Jul-1-2018		
lotes.	ower-loss bandling	
General error handling and	d stability improvements	
TRIM time performance in Enhanced data integrity al	nprovement	
Closed a vulnerability in th	e firmware download process	
	e Update Available he firmware on each \$510 he firmware on each \$510 he firmware on each \$510 hersion: DOMU417 Date: Jul-1-2018 Votes: Improved asynchronous p General error handling an TelM time performance in Enhanced data integrity al Closed a vulnerability in th	e Update Available he firmware on each \$5100PRO drive in the system. Insion: D0MU417 Date: Jul-1-2018 Notes: Improved asynchronous power-loss handling General error handling and stability improvements TRIM time performance improvement Enhanced data integrity algorithms Closed a vulnerability in the firmware download process



Manually Updating Firmware

- 1. Download the latest firmware from micron.com.
- 2. Click the Choose File option and locate the firmware package file.
- 3. Click Update Firmware Now.

Fig: 15 Firmware Update Completed

f System Information	C mtinvme200112abcdef - Good He	alth
Drive Details		
ılı S.M.A.R.T. ≯	Current Driver Version: 10.0 25300 1000 (Standard NVM E	xpress Controller)
보 Firmware Updates >		
Ø Sanitize Drive	Current Firmware: <i>E2MU119</i>	Check for Firmware Updat
⊗ Format Drive		
	update. If performed correctly, there will be no loss of system or user data on the drive. Ho reason, your solid state drive may not function properly. If this update is done on a notebo	wever, if the firmware process is interrupted for any ok computer, it is strongly recommended that power b
▼ Momentum Cache >	supplied by the AC power adapter.	
■ Flex Capacity		
Over Provisioning	Firmware Update Completed The firmware has been successfully updated on all target drives.	
P Device Self-Test	You might need to refresh the application or restart the system for firmwar	e update to take effect.



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Erasing a Drive

This section explains how to remove all data from a drive by performing a Sanitize, Format drive or Physical Security ID (PSID) revert operation.

Performing a Sanitize Drive Operation

The sanitize drive operation is supported on all drives except for encrypted drives (those with TCGenabled/password-protected). These drives must use the PSID revert operation to remove data. See <u>Performing a PSID Revert Operation</u>.

Also note:

- This operation runs on systems in AHCI mode. If your system is in IDE mode, change to AHCI mode and then proceed.
- This operation cannot be performed on mounted drives. Unmount the drive before proceeding. See <u>Unmounting Drives and Drive Partitions</u>.
- This operation cannot be performed on drives connected behind a RAID controller.

CAUTION: This operation completely removes all data from a drive. If possible, back up important data to alternate storage media before performing the operation.

- 1. Click the Sanitize Drive menu and select a drive.
- Review the information on the screen.
 If the drive is mounted or contains mounted partitions, an option to take the drive offline and unmount all partitions appears. Click this option to continue with the operation.
- 3. Click Yes, sanitize drive and remove ALL data to perform the operation.
- 4. The operation starts. On Windows systems (boot drives only), the system reboots during the sanitize drive process. No reboot occurs on Linux systems or on non-boot drives in Windows systems.
- 5. When complete, all data from the drive is removed.

Fig: 16 Sanitize Drive for non-NVMe drives.

WARNING:	
All data will b	e removed from the drive.
When you sanitiz	e this drive, all data stored on it will be erased. Sanitizing will erase everything on the drive including all
partitions. Before	sanitizing your drive, make sure to backup your data and unmount any mounted partitions.
Don't turn off you	computer while the drive is sanitizing. This process may take several minutes or up to an hour,
depending on how	v much data is stored on the drive.



For NVMe drive Block Erase, Crypto Erase, or Overwrite can be selected.

Fig: 17 Sanitize Drive for NVMe drives.

Sanitize drive will	delete all data in the drive. Please select the type you want to delete the drive below	
Please Select Sani	ize Type:	
Block		
Crypto		
Overwrite This op	ration is disabled because it is not supported by the drive.	
Are you sure yo	u want to perform a sanitize operation on this drive?	
No.	trive and remove ALL data	

Performing a Format Drive Operation

The Format operation is used to low level format the NVM media. This may destroy all data and metadata associated with the specified namespace(s). This is used when the host wants to change the LBA data size and/or metadata size.

The format operation is supported on all drives except for encrypted drives (those with TCGenabled/password-protected). These drives must use the PSID revert operation to remove data. See <u>Performing a PSID Revert Operation</u>.

This operation cannot be performed on mounted drives. Unmount the drive before proceeding. See <u>Unmounting Drives and Drive Partitions</u>.

- 1. Click the Format Drive menu and select a drive.
- 2. Select the namespace(s) and Format type to perform format operation.
- 3. Review the information on the screen.
- 4. Click Yes, perform format to perform format operation on drive and remove all data.
- 5. The operation starts. When complete, all data from the drive is removed.



Fig: 18 Format Drive for NVMe drives

Format drive will delete all data in the drive. Please s	elect the type you want to delete the drive below	
Select Namespace Select All Namespaces To select "MULTIPLE" :(Ctrl + left click) Namespace ID: 1 +	Please select Format Type below: Non-Secure LBA - Metadata size LBA Size: 512 Metadata size: 0 Secure: User Data Secure: Crypto	·

Performing a PSID Revert Operation

The PSID revert operation removes all data from an encrypted drive (one with TCG-enabled/passwordprotected). It can also be used in the event you have an encrypted drive for which you have lost the authentication code to return the drive to its factory default state.

TCG is automatically enabled on drives that are initialized in systems running Windows 8 or later, or it can be enabled with third-party software utilities. For more in- formation on TCG, refer to http://www.trustedcomputinggroup.org/.

To determine if TCG is enabled on your drive, view the Drive Details screen. Drives with TCG enabled appear with the eye icon next to the drive number.

Fig: 19 TCG-Enabled Drive







Before You Begin

Obtaining the PSID Code

The drive's PSID code is required to run this operation. The PSID code is located on the front label of the drive (Fig: 20). Obtain this code before proceeding.

Fig: 20 PSID Code



Unmounting Drives and Drive Partitions

A PSID revert operation cannot be performed on mounted drives or drives with mounted partitions.

To unmount a drive in Linux, issue the unmount command.

To unmount a drive in Windows:

- 1. Open an administrator command prompt.
- 2. Run the following command: **compmgmt.msc**
- 3. Select Disk Management.
- 4. Right-click on the target drive and select Offline.

Running PSID Revert

These instructions apply to both Windows and Linux systems. However, some configuration is required on Linux systems before performing this operation. See <u>Configuring Linux Systems to Perform a PSID Revert</u> <u>Operation</u>.

CAUTION: This operation completely removes all data from the drive and returns the drive to its factory default state. If possible, back up important data to alternate media before performing the operation.

- 1. Click the **PSID Revert** menu and select a drive.
- 2. Review the information on the screen.
- 3. In the PSID field, enter the **32–Character PSID code** found on the front label of the drive.
- 4. Click Yes, perform PSID Revert to perform the operation.



Fig: 10 PSID Revert

	Micron_1100_MTFDDAK612TBN		
WAR	NING:		
All da	ata will be removed from the drive.		
When makes Don't t	you perform a PSID revert, all data stored on the drive wil sure to backup your data and unmount any mounted parti um off your computer while the operation is in progress. Revert will deactivate encryption on the selected drive	I become unreadable tions.	including all partitions. Please
Are you PSID Io The PSID	u sure you want to perform a PSID Revert op dentification) value can be found on the drive's main label.	eration on this d	rive?
Refer to t on the dr	he image to help identify the location of the PSID value ive.	N500 25 55	no variante anterestation
PSID:	12W12345-1WWW-1234-12W4-12345W123456		
PSID:	12W12345-1WWW-1234-12W4-12345W123456 Enter the 32-oharacter alpha-numeric PSID value locate	ed on the drive's front	label.

The operation begins and takes a few seconds to complete. When complete, a confirmation message appears, and all data is removed from the drive.

Configuring Linux Systems to Perform a PSID Revert Operation

TCG commands must be enabled on a Linux system to run the PSID revert operation. By default, all TCG commands are disabled (blocked) by a Linux kernel. To enable TCG commands, an additional kernel boot parameter (libata.allow_tpm=1) must be added.

The steps to add a kernel boot parameter vary by Linux distribution. The following are generic steps for adding a kernel boot parameter using the boot loader GRUB:

- 1. As a root user, make a back-up copy of the grub.conf file: cp/boot/grub/grub.conf /boot/grub/grub.conf.backup
- 2. As a root user open: /boot/grub/grub.conf
- 3. Go to the kernel boot line (the line that begins with "kernel /vmlinuz"). Some Linux distributions with multiple boot options have multiple kernel boot lines. In this case, you must determine the boot option that you would like to use for performing the PSID revert operation and edit that menu option.
- 4. Append the following option to the line: libata.allow_tpm=1
- 5. Save changes to /boot/grub/grub.conf.
- 6. Reboot the system.
- 7. Perform the PSID revert operation following the instructions in <u>Performing a PSID Revert Operation</u>.



- 8. As a root user, reinstate the backup copy of the grub.conf file: mv/boot/grub/grub.conf.back /boot/grub/grub.conf
- 9. Reboot the system.



Enabling or Disabling Momentum Cache

Momentum Cache is an intelligent software driver that dynamically leverages unused system resources to enhance burst performance. This feature runs on supported drives containing a boot volume in Windows systems only. It is recommended to enable Momentum Cache on your system's boot drive.

For more information on Momentum Cache, see the Enhancing Burst Performance with Momentum Cache Technical Note(TN-FD-32) available on <u>micron.com</u>.

Before enabling or disabling this feature, save all work and shut down any running applications.

- 1. Click the Momentum Cache menu.
- 2. Review the information on the screen.
- 3. Click the button next to a drive to enable or disable the Momentum Cache feature.
- 4. Confirm the operation when prompted.
- 5. The system reboots after the operation completes.

Fig: 11 Momentum Cache

Nomentum Cache version 1.7.3.0	Battery Detected
Nomentum Cache may enhance overall system perfor This feature is currently available for supported drives.	A battery backed power source was detected in your system.
	Using Momentum Cache with a battery backed power source is highly recommended in order to optimize the reliability of
	Momentum Cache.
lease select the drive you wish to enable M	Momentum Cache.
lease select the drive you wish to enable M Drive0 - Good Health	Momentum Cache. omentum Cache on Enable Momentum Cache
lease select the drive you wish to enable M Drive0 - Good Health MS10-MTFDOAK125MA2	Momentum Cache. omentum Cache on Enable Momentum Cache recommended that you enable Momentum Cache on your boor drive
lease select the drive you wish to enable N Drive0 - Good Health METO-MITFDOAK128MAZ It is Drive1 - Good Health Micron_ETOP_EEFDDAK980700	Momentum Cache. omentum Cache on Enable Momentum Cache recommended that you enable Momentum Cache on your boot drive Enable Momentum Cache



Setting Over-Provisioning Capacity

Over-provisioning allocates a percentage of a drive's free space to improve performance and endurance.

The over-provisioning space becomes available exclusively to the drive's controller, enabling the controller to use the space for various management functions. This leaves less usable capacity, but results in improved performance and endurance.

Requirements:

- Over-provisioning can be enabled on supported drives with NTFS file systems only.
- A drive must have a partition to enable over-provisioning (the over- provisioning capacity is set on the last accessible partition).

Restrictions:

- Over-provisioning can be set on a Raw partition; however, it is not recommended as damage to data can occur.
- Over-provisioning cannot be set on SAS drives.
- Over-provisioning cannot be set on drives with the following configurations: USB-attached, writeprotect enabled, offline status, dynamic status, or security locked.

Enabling Over-Provisioning

- 1. Click the **Over-Provisioning** menu and select a drive.
- 2. Click Initiate Over-Provisioning.

Fig: 23 Over-Provisioning

Micron_110	1 - Good Health 00_MTFDDAK512TBN	
Over-Provisioning	at a CON- for some to improve	formance and and under The OB
over-provisioning (or y anotates a perce	inage of an obolis nee space to improve per	normance and endurance. The or
space becomes available exclusively to t management functions. This leaves less must have a partition to enable OP, the (the SSD controller, enabling the controller to usable capacity, but results in improved perf OP capacity is set on the last accessible part	use the space for various formance and endurance. An SSD ition
space becomes available exclusively to t management functions. This leaves less must have a partition to enable OP, the O Drive1 - Micron_1100_MTFDDAK512TBN 476.	the SSD controller, enabling the controller to usable capacity, but results in improved perf OP capacity is set on the last accessible part 94 GB	use the space for vanous formance and endurance. An SSD ition.
space becomes available exclusively to t management functions. This leaves less must have a partition to enable OP; the O Drive1 - Micron_1100_MTFDDAK512TBN 476.	the SSD controller, enabling the controller to usable capacity, but results in improved perf OP capacity is set on the last accessible part 94 GB 429.24 GB E:1 80.00%	use the space for various formance and endurance. An SSD ition. 47.89 GB OP 10.00%
space becomes available exclusively to t management functions. This leaves less must have a partition to enable OP; the O Drive1 - Micron_1100_MTFDDAK512TBN 476. OP settings for Drive E:1	the SSD controller, enabling the controller to usable capacity, but results in improved perf OP capacity is set on the last accessible part 94 GB 429.24 GB E1 90.00%	use the space for vanous formance and endurance. An SSD ition. 47.69 GB OP 10.00%
space becomes available exclusively to t management functions. This leaves less must have a partition to enable OP; the (Drive1 - Micron_1100_MTFDDAK512TBN 476. DP settings for Drive E:1 Recommended:	the SSD controller, enabling the controller to usable capacity, but results in improved perf OP capacity is set on the last accessible part 94 GB 429.24 GB E-1 90.00%	use the space for vanous formance and endurance. An SSD ition. 47.89 GB OP 10.00% Clear OP Set OP



1. To enable Storage Executive to automatically allocate the recommended amount of over- provisioning capacity, click the button next to Recommended. The amount of over-provisioning capacity appears in the Custom field.

To allocate your own amount of over-provisioning capacity, do not select the but- ton. Simply enter the percentage amount (from 1–50%) in the Custom field.

- 2. Click Set OP.
- 3. Confirm the operation when prompted.
- 4. The over provisioning capacity is set immediately. No reboot is required.

Disabling Over-Provisioning

- 1. Click the **Over-Provisioning** menu and select a drive.
- 2. Click Initiate Over-Provisioning.
- 3. Click Clear OP.



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Setting Flex Capacity

The Flex Capacity feature allows you to change the capacity of a drive to help improve drive endurance. This feature changes the user allocated space, which limits the amount of data that can be stored on the drive. The capacity you set appears as the drive's new capacity in the OS; the remaining capacity becomes available to the drive for the purpose of performing background activities, which can help extend drive life.

The new capacity can be as low as 1GB but cannot exceed the native maximum capacity of the drive. This feature is available on supported drives only.

Important:

- All data is removed from the drive when you set the Flex Capacity.
- Before performing this operation, backup your data and unmount any mounted partitions.
- Do not turn off the system while the operation is in progress.

Setting Capacity

- 1. Click the **Flex Capacity** menu.
- 2. Enter the new maximum capacity for the drive in the New Capacity field.
- 3. Click Set Drive Capacity.
- 4. After the operation completes, power cycle the system. (A reboot is not sufficient; a full power cycle is required.)

Fig: 24 Setting Drive Capacity

WARNING:		
All data will be removed from the drive.		
When you use Flex Capacity on this drive, all data everything on the drive including all partitions. Befo unmount any mounted partitions. Don't turn off your computer while this operation is	stored on it w ire performing in progress.	II be erased. Changing the drive capacity will erase this operation, make sure to backup your data and
lexPro™ Firmware Architectu	re	
lexPro™ Firmware Architectur lex Capacity - Drive Capacity	re	
HexPro™ Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte	re r the	
ElexPro™ Firmware Architectus lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive.	re r the	It is strongly recommended that you power cycle
ElexPro [™] Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive. the new capacity may be as low as 1GB but cannot e e native maximum capacity of the drive	r the exceed	It is strongly recommended that you power cycle your system after the successful completion of this operation.
ElexPro TM Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive.	re r the Exceed	It is strongly recommended that you <i>power cycle</i> your system after the successful completion of this operation. You cannot reconfigure the drive capacity more than
ElexPro TM Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive. The new capacity may be as low as 1GB but cannot e e native maximum capacity of the drive.	r the exceed	It is strongly recommended that you power cycle your system after the successful completion of this operation. You cannot reconfigure the drive capacity more than once without the power cycle in between each change.
IexPro [™] Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive. te new capacity may be as low as 1GB but cannot e e native maximum capacity of the drive.	r the exceed	It is strongly recommended that you power cycle your system after the successful completion of this operation. You cannot reconfigure the drive capacity more than once without the power cycle in between each change. Rebooting your system is not sufficient, a full power cycle is required.
ElexPro [™] Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive. te new capacity may be as low as 1GB but cannot e e native maximum capacity of the drive.	re r the exceed	It is strongly recommended that you power cycle your system after the successful completion of this operation. You cannot reconfigure the drive capacity more than once without the power cycle in between each change. Rebooting your system is not sufficient, a full power cycle is required.
ElexPro [™] Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive. he new capacity may be as low as 1GB but cannot e e native maximum capacity of the drive.	re r the exceed	It is strongly recommended that you power cycle your system after the successful completion of this operation. You cannot reconfigure the drive capacity more than once without the power cycle in between each change. Rebooting your system is not sufficient, a full power cycle is required.
ElexPro TM Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive. he new capacity may be as low as 1GB but cannot e e native maximum capacity of the drive.	r the exceed	It is strongly recommended that you power cycle your system after the successful completion of this operation. You cannot reconfigure the drive capacity more than once without the power cycle in between each change. Rebooting your system is not sufficient, a full power cycle is required.
IexPro TM Firmware Architectur lex Capacity - Drive Capacity ex Capacity firmware architecture allows you to alte aximum capacity of the drive. The new capacity may be as low as 1GB but cannot e e native maximum capacity of the drive.	r the exceed Set Driv	It is strongly recommended that you power cycle your system after the successful completion of this operation. You cannot reconfigure the drive capacity more than once without the power cycle in between each change. Rebooting your system is not sufficient, a full power cycle is required.



Returning to Native Drive Capacity

- 1. Click the **Flex Capacity** menu.
- 2. Click Reset to Native Max. Capacity.



Running Device Self-Test

The Device Self-Test feature allows you to test the health of the drive. The drive remains operational during testing and all data on the drive is preserved; however, performance may be reduced during the test operation.

This feature is available on supported drives only.

Fig: 25 Running the Device Self-Test



- 1. Click the Device **Self-Test** menu.
- 2. Select the type of test to run.

Short Self-Test: Performs a quick test of the drive.

Extended Self-Test: Performs a more in-depth test of the drive, consisting of reads and writes.

- 3. Click Run Self-Test.
- 4. The test progress appears. When complete, the results of the test appear under the drive name.



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Managing Namespaces

The Namespace Management feature allows you to create or delete namespaces on a supported NVMe drive. A namespace is a collection of logical blocks with addresses that range from 0 to the size of the name space. A namespace appears as a standard block device on which file systems and applications can be deployed without any modification.

Creating a Namespace

- 1. Click the Namespace Management menu and select a drive.
- 2. Click Create Namespace.
- 3. In the Namespace Type field, select TLC or SLC.
 - If you select TLC, provide the namespace size in LBs.
 - If you select SLC, provide the namespace size in terms of percentage. Valid percentages are: 10, 20, 30, 40, 50, 100.
- 4. Click Create.

Fig: 26 Namespace Management

	Micron_9300_MTFD	HAL3T8TDP	
Namespace Manage	ment		
This option provides the ab	ility to manage the nam	espaces on a NVME device.	
Drive Details			
Total Capacity:		2747269120 byte	5
Available Capacity:		3772036505600 b	pytes
Largest Media Fragment:		3840755982336 b	pytes
Create Namespace			
Namespace ID:1			Delete
LBA Data Size:	512	Total Size:	2097152000
Max Capacity:	2.09 GB	Available Space:	2.09 GB

Deleting a Namespace

- 1. Click the Namespace Management menu and select a drive.
- 2. Click Delete Namespace next to the namespace to be deleted.
- 3. Confirm the operation when prompted.



Revision History

Rev. U – 09/23	Updated supported drive models.Added few screenshots.Aligned the document.
Rev. T – 02/23	Updated supported drive models.
Rev. S – 02/23	Updated supporting drive models.
Rev. R – 02/23	Updated supporting drive models.
Rev. Q – 02/23	Added Format Namespace feature.
Rev. P – 02/23	 Added 2100AI, 2100AT SSDs. Added Namespace Management feature.
Rev. O – 02/23	 Updated for release 5.05. Added 5300, 7300 Series SSDs. Removed P1 SSD.
Rev. N – 02/23	• Added P1, 1300, 9300 Series SSDs.
Rev. M – 02/23	Updated OS support information.
Rev. L – 03/22	 Updated for release 3.63. Added 2200 Series. Updated OS support information.
Rev. K – 01/22	Updated for release 3.60.Updated operating system requirements.
Rev. J – 10/21	 Updated for release 3.58. Added Device Self-Test feature. Updated Firmware Update feature.
Rev. I – 04/21	Updated for release 3.56.Added 5210 and 5200 Series.
Rev. H – 01/21	 Updated for release 3.49. Added 9200 Series. Updated Flex Capacity information. Updated OS support information.
Rev. G – 11/19	 Updated for release 3.38. Added 1100 and 5100 series support. Added RAID controller support. Added Flex Cap feature. Updated Installing and Starting Storage Executive section.
Rev. F – 07/19	 Updated for release 3.34. Added NVMe support. Revised Viewing and Saving Drive Details and Performing a Firmware Update sections. Added Viewing Drive Performance and Optimization section. Added Removing a Drive section.



Rev. E – 04/19	• Updated for release 3.30.
Rev. D – 03/19	 Updated for release 3.24. Added support for M500IT and SAS drives, over-provisioning, and live firmware up- dates.
Rev. C – 04/18	 Updated for release 3.20. Added support for P400m, Momentum Cache, SMART threshold exceeded drive status.
Rev. B – 10/17	• Updated for release 3.17.
Rev. A – 3/17	• Initial release; version 3.15.

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