

Intel® Solid State Drive Toolbox

Release Notes

September 2017
Software Version 3.4.7

Document Number: 325993-035US



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Supported Products

- Intel® Optane™ Memory
- Intel[®] Solid State Drive 310 Series
- Intel® Solid State Drive 311 Series
- Intel® Solid State Drive 320 Series
- Intel® Solid State Drive 330 Series
- Intel® Solid State Drive 335 Series
- Intel® Solid State Drive 545s Series
- Intel® Solid State Drive 510 Series
- Intel® Solid State Drive 520 Series
- Intel® Solid State Drive 525 Series
- Intel® Solid State Drive 530 Series
- Intel® Solid State Drive 535 Series
- Intel[®] Solid State Drive 540s Series
- Intel® Solid State Drive 600p Series
- Intel® Solid State Drive 710 Series
- Intel® Solid State Drive 730 Series
- Intel® Solid State Drive 750 Series
- Intel® Solid State Drive E 5400s Series
- Intel[®] Solid State Drive E 5410s Series
- Intel® Solid State Drive E 5420s Series
 Intel® Solid State Drive E 6000p Series
- Intel® Solid State Drive Pro 1500 Series
- Intel® Solid State Drive Pro 2500 Series
- Intel® Solid State Drive Pro 5400s Series
- Intel® Solid State Drive Pro 6000p Series
- Intel® Solid State Drive Pro 6000p Series
- Intel® X18-M / X25-M SATA SSDs (34nm)
- Intel® X18-M / X25-M SATA SSDs (50nm)
- Intel® X25-E SATA SSDs
- Intel® X25-V SATA SSD
- Intel® Solid State Drive DC D3600 Series
- Intel® Solid State Drive DC D3700 Series
- Intel® Solid State Drive DC P3100 Series
- Intel® Solid State Drive DC P3500 Series
- Intel® Solid State Drive DC P3520 Series
 Intel® Solid State Drive DC P3600 Series
- Intel Solid State Drive DC P3600 Series
- Intel® Solid State Drive DC P3608 Series
 Intel® Solid State Drive DC P3700 Series
- Intel Solid State Drive DC 13700 Series
- Intel® Solid State Drive DC P4500 Series
- Intel® Solid State Drive DC P4501 Series
- Intel® Solid State Drive DC P4600 Series
- Intel® Optane™ Solid State Drive DC P4800X Series
- Intel[®] Solid State Drive DC S3100 Series
- Intel® Solid State Drive DC S3500 Series
- Intel® Solid State Drive DC S3510 Series
- Intel® Solid State Drive DC S3520 Series
- Intel® Solid State Drive DC S3610 Series
- Intel® Solid State Drive DC S3700 Series
- Intel® Solid State Drive DC S3710 Series



Revision History

Date	Version	Description
		This revision adds a firmware update for the 256GB and 512GB Intel® SSD 540s and Pro 5400s Series as well as firmware updates for the Intel® SSD 545s and DC S3520 Series drives.
		For the 256GB and 512GB Intel® SSD 540s Series, the latest firmware revision is 015C.
		For the 256GB and 512GB Intel® SSD Pro 5400s Series, the latest firmware revision is 015P.
		These firmware versions contain the following enhancements:
		 Optimized SATA signal integrity Optimized behavior entering and resuming from low-power states
		These firmware versions contain fixes for the following issues:
		 Intermittent errors when resuming from unsafe shutdown Fixed issues around use in Connected Standby Fixes to intermittent boot error in Linux* Mitigates a security vulnerability INTEL-SA-00079
		For the Intel® SSD 545s Series, the latest firmware revision is 002C.
1	3.4.7	These firmware versions contain the following enhancements:
September 2017		 Improved drive behavior during unsafe shutdown scenarios Improved drive behavior with non-aligned 4K workloads Improved garbage collection capabilities Updates to SMART table to provide persistent SMART behavior during power cycle, firmware upgrade and secure erase Optimized Power Management behavior with DIPM enabled and transition to different power states
		For the Intel® SSD DC S3520 Series, the latest firmware revision is N2010121.
		These firmware versions contain fixes for the following issues:
		 Subsequent firmware updates no longer require a power cycle of the system. Drive may enter a disabled logical state or report SMART AFh failure if powered on after storage in certain conditions. Drive may enter disabled logical state when executing SMART Extended self-test routine in captive mode. Sanitize feature set cannot be re-enabled following an SSP disable and COMRESET Misc. sightings closure and improvement on product health.
		This release of the tool also contains fixes for the following issues
		 Optimizer incorrectly reporting some drives as being in a RAID configurations. SMART data not being report for some drives Fixes reported issues seen when attempting to update firmware on the Intel® Optane Memory with the Windows* 10 NVMe* driver.

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Date	Version	Description
		This release of the Intel® SSD Toolbox includes support for the Intel® SSD DC P4501 Series products.
		This revision adds a firmware update for the Intel® Optane™ Memory, the Intel® SSD 600p, Pro 6000p, E 6000p, 540s, Pro 5400s and E 5400s Series, Intel® SSD DC P3100 and DC S3100 Series.
		For the Intel® Optane™ Memory, the latest firmware revision is K3110310.
		This firmware version contains fixes for intermittent enumeration issues.
		For the Intel® SSD 600p Series, the latest firmware revision is 121C.
		For the Intel® SSD Pro 6000p Series, the latest firmware revision is 121P.
		For the Intel® SSD E 6000p Series, the latest firmware revision is 121E.
		For the Intel® SSD DC P3100 Series, the latest firmware revision is 119D.
		These firmware versions contain the following enhancements:
	3.4.6	Improved link initializations
		These firmware versions contain fixes for the following issues:
June 2017		 Drive hangs intermittently after Format NVM command. Format NVM command occasionally failing with PCIe* ASPM enabled. Data miscompare caused by intermittent data corruption during heavy write workload with small file transfer size. Incorrect drive behavior for command with Forced Unit Access setting. (Pro 6000p only) Mitigates a security vulnerability INTEL-SA-00078
		For the Intel® SSD 540s Series, the latest firmware revision is 041C.
		For the Intel® SSD Pro 5400s Series, the latest firmware revision is 041P.
		For the Intel® SSD E 5400s Series, the latest firmware revision is 041E.
		For the Intel® SSD DC S3100 Series, the latest firmware revision is 041D.
		These firmware versions contain the following enhancements:
		Optimized SATA signal integrityOptimized behavior entering and resuming from low-power states
		These firmware versions contain fixes for the following issues:
		 Intermittent errors when resuming from unsafe shutdown Fixed issues around use in Connected Standby Fixes to intermittent boot error in Linux* Mitigates a security vulnerability INTEL-SA-00079
		Intel SSD Toolbox version 3.4.5 and newer mitigate a security vulnerability (see Intel Security Advisory INTEL-SA-00074).



Date	Version	Description
		This release of the Intel® SSD Toolbox includes support for the Intel® Optane™ Memory products. When using Intel® Optane™ Memory as a system accelerator, expect an extra Volume tab in the SSD Toolbox due to accelerator configuration. Also, several features are disabled in Toolbox when system acceleration is configured. Support has also been added for the Intel® Optane™ SSD DC P4800X Series, and the Intel® SSD DC P4600 and P4500 Series.
		This release also includes firmware updates for the Intel® SSD DC S3520, 750 and Pro 5400s (80/120GB) Series products.
May 2017	3.4.5	For the Intel $^\circ$ SSD DC S3520 Series, 2.5" only, the latest firmware revision is N2010112.
May 2017	3.4.3	For the Intel® SSD 750 Series, the latest firmware revision is 8EV101H0. The latest bootloader revision is 8B1B0133.
		This firmware version contains fixes for the following issues:
		 XN022 Assert Fixes Sequential read performance improvement at end of life from firmware 8EV101F0 Misc. sightings closure and improvement on product health.
		For the Intel® SSD Pro 5400s (80/120GB), the latest firmware revision is 36P. For firmware fix details, please see release note from September 2016.
February 2017	3.4.3	This release of the tool includes detection of the firmware update for the Intel® SSD DC D3700, DC D3600, DC P3700, DC P3600, DC P3608, and DC P3500 Series products. The latest firmware revision is 8DV101H0. The latest bootloader revision is 8B1B0133.
		Please use the Intel® SSD Data Center Tool should you wish to receive the above mentioned firmware and bootloader updates.

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Date	Version	Description
		This release includes a firmware update for the Intel® SSD DC S3610 and the Intel® SSD DC S3710 Series products. The latest firmware version is G2010160. This firmware version includes support for the ACS-3 command set.
		This release includes a firmware update for the Intel® SSD 600p, Intel® SSD Pro 6000p, Intel® SSD E 6000p and the Intel® SSD DC P3100 Series products. Users on Windows* 7 or 8.1 must use the Intel® SSD Firmware Update Tool to receive the firmware update.
		For the Intel® SSD 600p Series, the latest firmware revision is 109C.
		For the Intel® SSD Pro 6000p Series, the latest firmware revision is 109P.
		For the Intel® SSD E 6000p Series, the latest firmware revision is 109E.
January 2017	3.4.1	For the Intel® SSD DC P3100 Series, the latest firmware revision is 109D.
		These firmware versions contain the following enhancements:
		 Optimized drive shutdown sequence for better handling during poor system shutdown Improved power on behavior when resuming from an unsafe shutdown. Improvements to PS3 resume behavior Improvements to PHY initialization process Improvements to PERST# and CLKREQ# detection for corner case issues Improved end of life management of bad blocks for better reliability
		These firmware versions contain fixes for the following issues:
		Fixed potential issue of incorrect data may be read-during resume from low power state
October 2016	3.4.0	This release of the Intel® SSD Toolbox includes support for the Intel® SSD E 5420s and support with the Windows 10* NVMe* driver for the Intel® SSD 600p, Pro 6000p, E 6000p and DC P3100 Series products. This release has a fix to the behavior of status of Optimizer correcting a "Never Run Before" issue.
		This release requires Windows 7 with SP1 or newer as well as the install of .NET 4.0 or greater on the system. The tool no longer supports Windows XP* and Windows Vista*



Date	Version	Description
		This release of the Intel® SSD Toolbox includes a firmware and bootloader update for the Intel® SSD 750 Series products. The latest firmware version is 8EV101F0. The latest bootloader version is 8B1B0133.
		This firmware version contains the following enhancements:
		 Added NVME IO Queue Metrics log page support Added Secure Erase Command Monitoring log page support Updated Secure Erase Command User Data Erase option Prefetch activate/deactivate logic enhancement Misc. sightings closure and improvement on product health.
		This firmware version contains fixes for the following issues:
	3.3.7	 Fix for drive entering disable logical mode after frequent, repeated O/S reboots Fix for sequential read performance decay Fix for formatting 4k+DIF causing read errors when using Intel SPDK
		There is a firmware update available for the Intel® SSD 540s, E 5400s Series and the Intel® SSD DC S3100 Series products. This release of the Intel® SSD Toolbox will detect if user's drive is eligible for the firmware update and directs them to use the Intel® SSD Firmware Update Tool.
5 1 2016		For the Intel® SSD 540s Series, the latest firmware revision is 036C.
September 2016		For the Intel® SSD E 5400s Series, the latest firmware revision is 036E.
		For the Intel® SSD DC S3100 Series, the latest firmware revision is 036D.
		This firmware release provides the following changes:
		 (Specific to the Pro 5400s only) Fixes drive issues occurring when using WinMagic* software with drive Opal security Fixes issue that BSOD occurs during S3/S4 resume on systems supporting devsleep Mitigates a security vulnerability which in some cases resulted in corruption of user's data (see Intel Security Advisory INTEL-SA-00055)
		This release includes the latest version of the Intel Update Manager, v3.4.1942, in the installation.
		This release includes the following tool fixes and updates
		 Fixed download center and check for updates links. Fixed issue where tool stops working on Windows* 10 with Marvel RAID drive. Fixed command line crash when using –identify_device filename.bin on NVMe drives Updated product detection Mitigates a security vulnerability in the tool (see Intel Security Advisory INTELSA-00061; CVE-2016-8101)

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Date	Version	Description
		There is a firmware update available for the Intel® SSD 540s, E 5400s Series and the Intel® SSD DC S3100 Series products. This release of the Intel® SSD Toolbox will detect if user's drive is eligible for the firmware update and directs them to use the Intel® SSD Firmware Update Tool.
		For the Intel® SSD 540s Series, the latest firmware revision is 031C.
		For the Intel® SSD E 5400s Series, the latest firmware revision is 031E.
June 2016	3.3.6	For the Intel® SSD DC S3100 Series, the latest firmware revision is 031D.
		The following changes are included in the firmware update:
		 Corrected SMART AAh, E8h, ABh, and ACh behavior Corrected DIPM enabled after COMRESET issue Corrected errant FIS causing BSOD when Write Cache disabled Corrected SATA NCQ Command Error log reporting issue Mitigated a security vulnerability which in some cases resulted in corruption of user's data (see Intel Advisory INTEL-SA-00053).
April 2016	3.3.5	This release of the Intel® SSD Toolbox updates the signing certificate to a new SHA256 certificate. This will fix issues where the tool was being reported as "invalid" at download.
April 2016	3.3.4	Documentation update only This release of the Intel® SSD Toolbox includes support for the Intel® SSD 540s, Pro 5400s, E 5400s and E 5410s Series and the Intel® SSD DC S3100, DC P3320, DC D3700 and DC D3600 Series products.
		This release of the Intel® SSD Toolbox includes a firmware update for the Intel® SSD DC S3700, DC S3500, DC S3710, DC S3610 and DC S3510 Series products.
		For the Intel SSD DC S3700 Series, the latest firmware revision is 5DV12270.
		For the Intel SSD DC S3500 M.2 and DC S3500 HD Series, the latest firmware revision is G2010150.
		For the Intel SSD DC S3500 Series, the latest firmware revision is D2012370.
March 2016	3.3.4	For the Intel SSD DC S3710, DC S3610 and DC S3510 Series, the latest firmware revision is G2010150. The following changes are included in this firmware update:
		 Fixed SATA CRC errors seen when running at 3Gbps Corrected SMART 05h behavior Fixed power consumption on Staggered Spin-up.
		These latest firmwares include a fix for a specific use condition where in certain cases if the device receives a command that violates the SATA protocol specification, the drive may ASSERT or stop responding to host commands (See Intel Advisory INTELSA-00050).



Date	Version	Description
		This release of the Intel® SSD Toolbox includes a firmware update for the Intel® SSD 750 Series. The latest firmware revision is 8EV10174. The latest bootloader revision is 8B1B0131 (no change).
		The following changes are included in the Intel SSD 750 Series firmware update:
November 2015	3.3.3	 Fixed LED behavior to appear LED-On when drive active and LED-Off when drive idle. Fix for some use cases where user data may be inaccessible or at risk of loss. (see Intel Advisory <u>INTEL-SA-00047</u>) Misc. sightings closure and improvement on product health.
		This release also includes the following tool fixes:
		Fix to firmware update process – handling drives in failure states.
		Known compatibility issues with RAID volume configurations using RST version 13.2+
October 2015		This release of the Intel® SSD Toolbox includes a firmware update for the Intel® SSD 750 Series. The latest firmware revision is 8EV10171. The latest bootloader revision is 8B1B0131.
	3.3.2	 The following changes are included in the Intel SSD 750 Series firmware update: Vendor Unique Command to change SM BUS address on "NVMe* Basic Management Command" Improved TRIM IOPS operation In-field Drive Configuration Update capability Windows* Driver update with bug fixes Misc. sightings closure and improvement on product health
		This release also includes the following tool fix
		Fixed issue with the reading of the SMART / Health Log with latest firmware on NVMe products.

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Date	Version	Description
		This release of the Intel® SSD Toolbox includes firmware updates for the Intel® SSD Pro 2500 and Intel® SSD 535 Series and the Intel® SSD DC S3710, DC S3610, DC S3510, DC S3500 M.2 and DC S3500 HD Series products.
		The following changes are included in the Intel SSD Pro 2500 and 535 Series firmware update:
August 2015	3.3.1	 (Specific to the Pro 2500 Series only) DevSleep wake optimizations for more robust resume after devsleep Fix for Windows* disk error occurring after devsleep on systems with ATA user password Fix for I/O abort due to Sanitize Freeze Lock after COMRESET Fix for Drive Self-Test reporting incorrect status after test abort
		The following changes are included in the Intel® SSD DC S3710, DC S3610, DC S3510, DC S3500 M.2 and DC S3500 HD Series firmware Update:
		 Added support for SMART Attribute F3h Modification to Secure Erase to include NAND Erase Improvements to the Maximum Latency for all Sequential and Random Write workloads Added a fourth PHY mode setting to accommodate long interconnects (> 8-inches)
		This release also includes the following tool fix:
		Correction to Drive Health reporting of NVMe products
May 2015	3.3.0	This release of the Intel® SSD Toolbox adds support for the new Intel® SSD 750 and 535 Series, as well as adds NVMe support for all existing Toolbox features.
July 2014	3.2.3	This release of the Intel® SSD Toolbox adds support for the Intel® SSD Pro 2500 Series and other Intel SSD products. It also fixes the issue of displaying drives larger than 1TB.
		This release of the Intel SSD Toolbox includes firmware updates for both Intel SSD DC S3700 and DC S3500 products with the following changes:
February 2014	3.2.1	 In the unlikely event that a drive fails, the drive will now report the correct serial number and actual capacity. The error code is available in ID block word 140 and GPL address 0xDD. When a power-off is less than 500ms the drive will automatically reset and allow proper drive enumeration. Support for both 512B and 4KB physical sector size As blocks are retired, the SMART E8h value will decrease linearly. After a power cycle, timed workload variables will resume from the last saved values and update after 60 minutes and every minute thereafter. SMART Attribute 05h now has a normalized value of 100. SMART Attribute C2h now reports the correct temperature.



Date	Version	Description
	3.2.0	This version of the tool contains a firmware update for the Intel® SSD 530 Series (to version DC31 for M.2 drives, DC32 for 2.5" drives and DC33 for mSATA drives) with the following changes:
December 2013		 Default Software Settings Preservation (SSP) for DIPM is changed from a default = on, to a DEFAULT = OFF. This addresses situations in older systems where the drive was not found after a warm reset causing blue screens. Corrects an occasional miss-reporting of SMART attribute E3h (Timed Workload Read/Write ratio). The drive no longer increments SMART 0Ch (Power Cycle Count) after a SECURE ERASE operation.
		This release of the Intel SSD Toolbox includes the following improvements:
October 2013	3.1.9	 Support for new Intel SSD product names Changed SMART attributes AF, BE, EA to represent RAW values in HEX while the breakouts of each attribute will be decimal. Fixed an issue when a physical drive is missing from a storage space.
		This release of the Intel SSD Toolbox includes a firmware release which contains the following:
		 Intel® SSD 530 Series firmware update to DC12 which addresses an occasional drive hang after resume from Link Power Management slumber state.
August 2013	3.1.8	Other tool related items are:
		 Added new descriptions for SMART attributes C2, C5, EA and F9
		 Corrected calculations for E1, F1 and F2 SMART attributes. Corrected the display of word 79 in the Drive Details screen
		This release contains the following:
	3.1.6	Intel® SSD DC S3500 Series firmware update to 0355 which:
July 2013		 Provides an update to the SMART Error Log after the download microcode command is executed. Other ongoing improvements were made to address manufacturability and IOPs consistency.
		This release also adds a tool update to return many of the SMART RAW values to integers from hexadecimal numbers and adds support for drives starting with a serial number of EK.

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Date	Version	Description
		This release contains the following:
		Intel® SSD DC S3700 Series firmware update to 0265 which fixes the following issues:
		 The drive may exhibit longer latency behind certain HBA/RAID cards under specific sequential workloads. SMART attribute EAh was not correctly incrementing The drive may return an incorrect response or become unresponsive to an LBA write above a 32-bit address
June 2013	3.1.5	Intel® SSD 335 Series firmware update to 335u which provides continuous improvement optimizations intended to provide the best possible user experience with the Intel SSD.
		This release adds the following tool updates:
		 Support for additional new Intel SSDs Enhanced Optimizer scheduling functionality Improved installation performance Improved SMART Details output Updated Drive Details output
November 2012	3.1.2	This release adds a firmware update for the Intel® SSD 335 Series fixing the following issue: • Incorrect reporting of the E9h media wear indicator value
		incorrect reporting of the ESH media wear indicator value
October 2012	3.1.1	This release fixes a condition where some Intel® SSDs are being incorrectly reported as degraded.
October 2012	3.1.0	This release adds support for Microsoft* Windows* 8 and Server 2012, Trim on RAID 0 with RST 11.0 or greater (NOTE: Trim on RAID 0 is not supported on Windows 8 or Server 2012), Plug-n-Play support for dynamically detecting drive removal and insertion events, proactive tool update notification for Windows 7 and Windows 8 systems and fixes Intel SSD Optimizer error on partitions configured with an allocation size of 32KB or 64KB.
September 2012	3.0.5	This release fixes an issue where all multi-language resource files were not displayed correctly.
September 2012	3.0.4	This release adds support for new Intel SSDs
April 2012	3.0.3	This release adds the following features: • Support for the Intel® SSD 330 Series • Definitions for SMART attributes B1h, B5h, B6h, and F9h This release corrects a bug where Identify Device word 214 was displaying the value for word 209.



Date	Version	Description
December 2011	3.0.2	This release fixes the following issues: Scheduled Intel SSD Optimizer sessions do not run on encrypted Intel SSDs Intel® SSD Optimizer does not run if Microsoft Windows* compression is enabled on any partition Intel® SSD 320 Series updates to incorrect version number on Lenovo* platforms (LE02 instead of LE04) SMART details do not display if SMART is disabled in IDENTIFY DEVICE status on the drive.
November 2011	3.0.1	This release corrects how the model number displays on the home screen for the 50nm MLC (2.5-inch form factor) Intel SSD. The SSD now appears as Intel® SSD X25-M instead of Intel® SSD X25-E.
October 2011	3.0.0	This release includes a new user interface and adds support for: Updating firmware on supported Intel® SSDs Viewing drive health Viewing estimated drive life remaining This release also contains an integrated help system and adds support for multiple languages.
October 2010	2.01	This release contains improvements to the Secure Erase feature and resolves intermittent timing issues that were occurring on a few platforms.
September 2010	2.0	This release contains these new features: System Configuration Tuner Secure Erase
March 2010	1.3	This release consists of continuous improvement changes.
December 2009	1.2	This release fixes problems with unusable system restore points, adds progress bars for diagnostics and Intel® SSD Optimizer functions, and incorporates improvements to look and feel.
October 2009	1.1	Initial Release.

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