

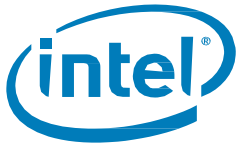
# Intel® Solid State Drive Toolbox

## Release Notes

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*October 2018*

*Software Version 3.5.6*



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## Supported Products

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### Intel® Optane™ Technology-based Products

- Intel® Optane™ Memory M10
- Intel® Optane™ Solid State Drive DC P4800X Series
- Intel® Optane™ Solid State Drive 900P Series
- Intel® Optane™ Solid State Drive 905P Series

### Intel® Solid State Drive Data Center Products

- 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 P3608 Series
- Intel® Solid State Drive DC P3700 Series
- Intel® Solid State Drive DC P4100 Series
- Intel® Solid State Drive DC P4500 Series
- Intel® Solid State Drive DC P4501 Series
- Intel® Solid State Drive DC P4600 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
- Intel® Solid State Drive DC S4500 Series
- Intel® Solid State Drive DC S4600 Series

### Intel® Solid State Drive Consumer Products

- 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 545s Series
- Intel® Solid State Drive 600p Series
- Intel® Solid State Drive 660p Series
- Intel® Solid State Drive 760p Series

### Intel® Solid State Drive Enthusiast Products

- Intel® Solid State Drive 730 Series
- Intel® Solid State Drive 750 Series

### Intel® Solid State Drive Professional Products

- 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 5450s Series
- Intel® Solid State Drive Pro 6000p Series
- Intel® Solid State Drive Pro 7600p Series

### Intel® Solid State Drive Embedded Products

- Intel® Solid State Drive E 5100s Series
- Intel® Solid State Drive E 5400s Series
- Intel® Solid State Drive E 5410s Series
- Intel® Solid State Drive E 6000p Series
- Intel® Solid State Drive E 6100p Series
- Intel® Solid State Drive E 7000s Series (formerly E 5420s)

### Legacy Intel® Solid State Drives

- 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 510 Series
- Intel® Solid State Drive 520 Series
- Intel® Solid State Drive 710 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



## Revision History

Date	Software Version	Description
October 2018	3.5.6	<p>This release of the Intel® SSD Toolbox includes firmware update for the Intel® SSD 545s Series products 128GB, 256GB and 512GB 2.5inch/M.2 80mm, for latest firmware revision LHF004C and 1TB 2.5inch, for latest firmware revision LHF0B2C Intel® SSD Pro 5450s Series products 256GB and 512GB 2.5inch/M.2 80mm, for latest firmware revision LHF004P and 1TB 2.5inch, for latest firmware revision LHF0B2P. Intel® SSD E 5100s Series products 128GB and 256GB 2.5inch/M.2 80mm, for latest firmware revision LHF003E and 64GB 2.5inch/M.2 80mm, for latest firmware revision LHFOA2E.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"><li>• Improved SMART E8/E9 implementation</li><li>• Improved NAND data refresh algorithms</li><li>• Improved SSD recovery flows from unsafe shutdown scenarios</li><li>• Optimized firmware policies to:<ul style="list-style-type: none"><li>• Prevent premature retirement of NAND blocks as bad</li><li>• Manage media page count changes during power state transitions</li><li>• Handle FW flows when E2E errors are triggered during secure erase operation</li><li>• This release of the tool also contains fixes for the following issues</li></ul></li><li>• Optimizer incorrectly reporting some drives as being in a RAID configurations.</li><li>• Corrected SMART F1h and F2h behavior</li></ul>
September 2018	3.5.5	<p>Intel® SSD 760p Series products for latest firmware revision 004C. Intel® SSD Pro 7600p Series products for latest firmware revision 004P.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"><li>• Fixed PS4 power state transition issue causing system BSOD or system hang</li><li>• Fixed intermittent system hang caused by pin based interrupt issue with shared resources</li><li>• Improvements to enable NVM Subsystem Reset</li><li>• Fixed unexpected power loss SMART reporting</li><li>• Enhanced error logging for SSD failure analysis</li><li>• Improved NAND refresh algorithms</li><li>• Improved software full disk encryption time</li></ul>
August 2018	3.5.4	<p>This release of the Intel® SSD Toolbox includes firmware update for the Intel® SSD 660p Series products, for latest firmware revision 002C</p> <p>This firmware version contains the following enhancement:</p> <ul style="list-style-type: none"><li>• Refined Power Management behavior and enhanced power state transitions.</li></ul>



Date	Software Version	Description
August 2018	3.5.3	<p>This release of the Intel® SSD Toolbox includes firmware update for the Intel® SSD 545s Series products (128GB, 256GB and 512GB), for latest firmware revision LHF003C.</p> <p>Intel® SSD Pro 5450s Series products (128GB, 256GB and 512GB), for latest firmware revision LHF003P.</p> <p>Intel® SSD E 5100s Series products (128GB and 256GB), for latest firmware revision LHF002E.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"> <li>• Improved SMART E8/E9 implementation</li> <li>• Improved SSD recovery flows from unsafe shutdown scenarios</li> <li>• Optimized firmware policies to: <ul style="list-style-type: none"> <li>• Prevent premature retirement of NAND blocks as bad</li> <li>• Manage media page count changes during power state transitions</li> <li>• Handle firmware flows when E2E errors are triggered during secure erase operations.</li> </ul> </li> </ul> <p>Additionally, this release also includes support and feature update for Intel® SSD 660p Series products as listed below</p> <ul style="list-style-type: none"> <li>• GUI feature added under Intel SSD optimizer “ Boost Performance” to clear internal cache of SSD</li> </ul>
April 2018	3.5.2	<p>This release of the Intel® SSD Toolbox includes a feature update for Intel® Optane™ Solid State Drive 905P Series as listed below</p> <ul style="list-style-type: none"> <li>• Command line option for LED color change on drive</li> <li>• Command line option to report current color on drive</li> </ul>
March 2018	3.5.2	<p>This release of the Intel® SSD Toolbox includes firmware update for the Intel® SSD 540s Series products, for latest firmware revision LSF042C.</p> <p>Intel® SSD Pro 5400s Series products, for latest firmware revision LSF042P.</p> <p>Intel® SSD E 5400s Series products, for latest firmware revision LSF042E.</p> <p>Intel® SSD DC S3100s Series products, for latest firmware revision LSF042D.</p> <p>This revision includes a firmware update for the 256GB and 512GB Intel® SSD 540s and Pro 5400s Series as well.</p> <p>Intel® SSD 540s Series products (256GB and 512GB), for latest firmware revision LBF016C.</p> <p>Intel® SSD Pro 5400s Series products (256GB and 512GB), for latest firmware revision LBF016P.</p> <p>This firmware version contains fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Fixed issue that, in some extreme cases, may result in user losing access to drive.</li> </ul>
February 2018	3.5.1	<p>This release of the Intel® SSD Toolbox includes firmware update for the Intel® SSD DC S4500/S4600 Series products; for latest firmware revision SCV10111.</p> <p>Firmware mapping updated, use latest Intel® SSD Data Center Tool to update to latest firmware version for</p> <p>Intel® SSD DC P4500/P4600 Series products; latest firmware revision QDV10170.</p> <p>Intel® SSD DC P4510/P4610 Series products; latest firmware revision VDV10120.</p> <p>Intel® Optane™ SSD DC P4800X Series products; latest firmware revisions E2010324 (375GB) and E2010325 (750GB).</p> <p>Additionally, this release also includes the following fix changes:</p> <ul style="list-style-type: none"> <li>• For Intel® SSD 760p Series, fixed drive namespace issue to support latest Intel® Client NVMe* Microsoft Windows* Drivers for Intel® SSDs</li> </ul>
January 2018	3.5.0	<p>This release of the tool also contains fixes for the following issues</p> <ul style="list-style-type: none"> <li>• Minor fixes to the GUI error outputs for diagnostic scanning and Optimize functionality.</li> <li>• Fixes known errors to feature permissions.</li> </ul>



Date	Software Version	Description
November 2017	3.4.9	<p>This revision adds a firmware update for the Intel® SSD DC P4500 and DC P4600 Series products. The latest firmware revision is QDV10150. The latest bootloader is QB1B0110.</p> <p>This firmware version contains fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Fixed issue where drive fails to boot as OS drive.</li> <li>• Fixed issue of bootloader download counter being incremented.</li> <li>• Includes mitigation to issue relating to Read ECC uncorrectable.</li> <li>• Corrections to when Critical Warning – RD bit is set.</li> <li>• Miscellaneous sightings closure and improvement on product health.</li> </ul> <p>Documentation Updates to the Supported Products list.</p>
September 2017	3.4.7	<p>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.</p> <p>For the 256GB and 512GB Intel® SSD 540s Series, the latest firmware revision is 015C.</p> <p>For the 256GB and 512GB Intel® SSD Pro 5400s Series, the latest firmware revision is 015P.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"> <li>• Optimized SATA signal integrity</li> <li>• Optimized behavior entering and resuming from low-power states</li> </ul> <p>These firmware versions contain fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Intermittent errors when resuming from unsafe shutdown</li> <li>• Fixed issues around use in Connected Standby</li> <li>• Fixes to intermittent boot error in Linux*</li> <li>• Mitigates a security vulnerability <a href="#">INTEL-SA-00079</a></li> </ul> <p>For the Intel® SSD 545s Series, the latest firmware revision is 002C.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"> <li>• Improved drive behavior during unsafe shutdown scenarios</li> <li>• Improved drive behavior with non-aligned 4K workloads</li> <li>• Improved garbage collection capabilities</li> <li>• Updates to SMART table to provide persistent SMART behavior during power cycle, firmware upgrade and secure erase</li> <li>• Optimized Power Management behavior with DIPM enabled and transition to different power states</li> </ul> <p>For the Intel® SSD DC S3520 Series, the latest firmware revision is N2010121.</p> <p>These firmware versions contain fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Subsequent firmware updates no longer require a power cycle of the system.</li> <li>• Drive may enter a disabled logical state or report SMART AFh failure if powered on after storage in certain conditions.</li> <li>• Drive may enter disabled logical state when executing SMART Extended self-test routine in captive mode.</li> <li>• Sanitize feature set cannot be re-enabled following an SSP disable and COMRESET</li> <li>• Misc. sightings closure and improvement on product health.</li> </ul> <p>This release of the tool also contains fixes for the following issues</p> <ul style="list-style-type: none"> <li>• Optimizer incorrectly reporting some drives as being in a RAID configurations.</li> <li>• SMART data not being report for some drives</li> <li>• Fixes reported issues seen when attempting to update firmware on the Intel® Optane Memory with the Windows* 10 NVMe* driver.</li> </ul>



Date	Software Version	Description
June 2017	3.4.6	<p>This release of the Intel® SSD Toolbox includes support for the Intel® SSD DC P4501 Series products.</p> <p>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.</p> <p>For the Intel® Optane™ Memory, the latest firmware revision is K3110310.</p> <p>This firmware version contains fixes for intermittent enumeration issues.</p> <p>For the Intel® SSD 600p Series, the latest firmware revision is 121C.</p> <p>For the Intel® SSD Pro 6000p Series, the latest firmware revision is 121P.</p> <p>For the Intel® SSD E 6000p Series, the latest firmware revision is 121E.</p> <p>For the Intel® SSD DC P3100 Series, the latest firmware revision is 119D.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"> <li>• Improved link initializations</li> </ul> <p>These firmware versions contain fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Drive hangs intermittently after Format NVM command.</li> <li>• Format NVM command occasionally failing with PCIe* ASPM enabled.</li> <li>• Data miscompare caused by intermittent data corruption during heavy write workload with small file transfer size.</li> <li>• Incorrect drive behavior for command with Forced Unit Access setting.</li> <li>• (Pro 6000p only) Mitigates a security vulnerability <a href="#">INTEL-SA-00078</a></li> </ul> <p>For the Intel® SSD 540s Series, the latest firmware revision is 041C.</p> <p>For the Intel® SSD Pro 5400s Series, the latest firmware revision is 041P.</p> <p>For the Intel® SSD E 5400s Series, the latest firmware revision is 041E.</p> <p>For the Intel® SSD DC S3100 Series, the latest firmware revision is 041D.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"> <li>• Optimized SATA signal integrity</li> <li>• Optimized behavior entering and resuming from low-power states</li> </ul> <p>These firmware versions contain fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Intermittent errors when resuming from unsafe shutdown</li> <li>• Fixed issues around use in Connected Standby</li> <li>• Fixes to intermittent boot error in Linux*</li> <li>• Mitigates a security vulnerability <a href="#">INTEL-SA-00079</a></li> </ul> <p>Intel SSD Toolbox version 3.4.5 and newer mitigate a security vulnerability (see Intel Security Advisory <a href="#">INTEL-SA-00074</a>).</p>

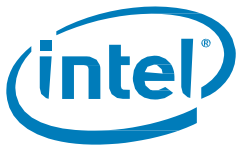


Date	Software Version	Description
May 2017	3.4.5	<p>This release of the Intel® SSD Toolbox includes support for the Intel® Optane™ Memory products. When using Intel® Optane™ Memory as a system accelerator, expect an extra Volume tab in the SSD Toolbox due to accelerator configuration. Also, several features 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.</p> <p>This release also includes firmware updates for the Intel® SSD DC S3520, 750 and Pro 5400s (80/120GB) Series products.</p> <p>For the Intel® SSD DC S3520 Series, 2.5" only, the latest firmware revision is N2010112.</p> <p>For the Intel® SSD 750 Series, the latest firmware revision is 8EV101H0. The latest bootloader revision is 8B1B0133.</p> <p>This firmware version contains fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• XN022 Assert Fixes</li> <li>• Sequential read performance improvement at end of life from firmware 8EV101F0</li> <li>• Misc. sightings closure and improvement on product health.</li> </ul> <p>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.</p>
February 2017	3.4.3	<p>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.</p> <p>Please use the Intel® SSD Data Center Tool should you wish to receive the above mentioned firmware and bootloader updates.</p>
January 2017	3.4.1	<p>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.</p> <p>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.</p> <p>For the Intel® SSD 600p Series, the latest firmware revision is 109C.</p> <p>For the Intel® SSD Pro 6000p Series, the latest firmware revision is 109P.</p> <p>For the Intel® SSD E 6000p Series, the latest firmware revision is 109E.</p> <p>For the Intel® SSD DC P3100 Series, the latest firmware revision is 109D.</p> <p>These firmware versions contain the following enhancements:</p> <ul style="list-style-type: none"> <li>• Optimized drive shutdown sequence for better handling during poor system shutdown</li> <li>• Improved power on behavior when resuming from an unsafe shutdown.</li> <li>• Improvements to PS3 resume behavior</li> <li>• Improvements to PHY initialization process</li> <li>• Improvements to PERST# and CLKREQ# detection for corner case issues</li> <li>• Improved end of life management of bad blocks for better reliability</li> </ul> <p>These firmware versions contain fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Fixed potential issue of incorrect data may be read during resume from low power state</li> </ul>

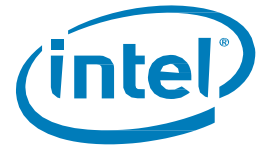




Date	Software Version	Description
October 2016	3.4.0	<p>This release of the Intel® SSD Toolbox includes support for the Intel® SSD E 5420s and support with the Windows 10* NVMe* driver for the Intel® SSD 600p, Pro 6000p, E 6000p and DC P3100 Series products.</p> <p>This release has a fix to the behavior of status of Optimizer correcting a “Never Run Before” issue.</p> <p>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*</p>
September 2016	3.3.7	<p>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.</p> <p>This firmware version contains the following enhancements:</p> <ul style="list-style-type: none"> <li>• Added NVME IO Queue Metrics log page support</li> <li>• Added Secure Erase Command Monitoring log page support</li> <li>• Updated Secure Erase Command User Data Erase option</li> <li>• Prefetch activate/deactivate logic enhancement</li> <li>• Misc. sightings closure and improvement on product health.</li> </ul> <p>This firmware version contains fixes for the following issues:</p> <ul style="list-style-type: none"> <li>• Fix for drive entering disable logical mode after frequent, repeated O/S reboots</li> <li>• Fix for sequential read performance decay</li> <li>• Fix for formatting 4k+DIF causing read errors when using Intel SPDK</li> </ul> <p>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.</p> <p>For the Intel® SSD 540s Series, the latest firmware revision is 036C.</p> <p>For the Intel® SSD E 5400s Series, the latest firmware revision is 036E.</p> <p>For the Intel® SSD DC S3100 Series, the latest firmware revision is 036D.</p> <p>This firmware release provides the following changes:</p> <ul style="list-style-type: none"> <li>• (Specific to the Pro 5400s only) Fixes drive issues occurring when using WinMagic* software with drive Opal security</li> <li>• Fixes issue that BSOD occurs during S3/S4 resume on systems supporting devsleep</li> <li>• Mitigates a security vulnerability which in some cases resulted in corruption of user's data (see Intel Security Advisory <a href="#">INTEL-SA-00055</a>)</li> </ul> <p>This release includes the latest version of the Intel Update Manager, v3.4.1942, in the installation.</p> <p>This release includes the following tool fixes and updates</p> <ul style="list-style-type: none"> <li>• Fixed download center and check for updates links.</li> <li>• Fixed issue where tool stops working on Windows* 10 with Marvel RAID drive.</li> <li>• Fixed command line crash when using -identify_device filename.bin on NVMe drives</li> <li>• Updated product detection</li> <li>• Mitigates a security vulnerability in the tool (see Intel Security Advisory <a href="#">INTEL-SA-00061</a>; CVE-2016-8101)</li> </ul>



Date	Software Version	Description
June 2016	3.3.6	<p>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.</p> <p>For the Intel® SSD 540s Series, the latest firmware revision is 031C.</p> <p>For the Intel® SSD E 5400s Series, the latest firmware revision is 031E.</p> <p>For the Intel® SSD DC S3100 Series, the latest firmware revision is 031D.</p> <p>The following changes are included in the firmware update:</p> <ul style="list-style-type: none"> <li>• Corrected SMART AAh, E8h, ABh, and ACh behavior</li> <li>• Corrected DIPM enabled after COMRESET issue</li> <li>• Corrected errant FIS causing BSOD when Write Cache disabled</li> <li>• Corrected SATA NCQ Command Error log reporting issue</li> <li>• Mitigated a security vulnerability which in some cases resulted in corruption of user's data (see Intel Advisory <a href="#">INTEL-SA-00053</a>).</li> </ul>
April 2016	3.3.5	<p>This release of the Intel® SSD Toolbox updates the signing certificate to a new SHA256 certificate.</p> <p>This will fix issues where the tool was being reported as "invalid" at download.</p>
April 2016	3.3.4	<p>Documentation update only</p> <p>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.</p>
March 2016	3.3.4	<p>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.</p> <p>For the Intel SSD DC S3700 Series, the latest firmware revision is 5DV12270.</p> <p>For the Intel SSD DC S3500 M.2 and DC S3500 HD Series, the latest firmware revision is G2010150.</p> <p>For the Intel SSD DC S3500 Series, the latest firmware revision is D2012370.</p> <p>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:</p> <ul style="list-style-type: none"> <li>• Fixed SATA CRC errors seen when running at 3Gbps</li> <li>• Corrected SMART 05h behavior</li> <li>• Fixed power consumption on Staggered Spin-up.</li> </ul> <p>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 <a href="#">INTEL-SA-00050</a>).</p>



Date	Software Version	Description
November 2015	3.3.3	<p>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).</p> <p>The following changes are included in the Intel SSD 750 Series firmware update:</p> <ul style="list-style-type: none"> <li>• Fixed LED behavior to appear LED-On when drive active and LED-Off when drive idle.</li> <li>• Fix for some use cases where user data may be inaccessible or at risk of loss. (see Intel Advisory <a href="#">INTEL-SA-00047</a>)</li> <li>• Misc. sightings closure and improvement on product health.</li> </ul> <p>This release also includes the following tool fixes:</p> <ul style="list-style-type: none"> <li>• Fix to firmware update process – handling drives in failure states.</li> </ul> <p>Known compatibility issues with RAID volume configurations using RST version 13.2+</p>
October 2015	3.3.2	<p>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.</p> <p>The following changes are included in the Intel SSD 750 Series firmware update:</p> <ul style="list-style-type: none"> <li>• Vendor Unique Command to change SM BUS address on “NVMe* Basic Management Command”</li> <li>• Improved TRIM IOPS operation</li> <li>• In-field Drive Configuration Update capability</li> <li>• Windows* Driver update with bug fixes</li> <li>• Misc. sightings closure and improvement on product health</li> </ul> <p>This release also includes the following tool fix</p> <ul style="list-style-type: none"> <li>• Fixed issue with the reading of the SMART / Health Log with latest firmware on NVMe products.</li> </ul>



Date	Software Version	Description
August 2015	3.3.1	<p>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.</p> <p>The following changes are included in the Intel SSD Pro 2500 and 535 Series firmware update:</p> <ul style="list-style-type: none"><li>• (Specific to the Pro 2500 Series only) DevSleep wake optimizations for more robust resume after devsleep</li><li>• Fix for Windows* disk error occurring after devsleep on systems with ATA user password</li><li>• Fix for I/O abort due to Sanitize Freeze Lock after COMRESET</li><li>• Fix for Drive Self-Test reporting incorrect status after test abort</li></ul> <p>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:</p> <ul style="list-style-type: none"><li>• Added support for SMART Attribute F3h</li><li>• Modification to Secure Erase to include NAND Erase</li><li>• Improvements to the Maximum Latency for all Sequential and Random Write workloads</li><li>• Added a fourth PHY mode setting to accommodate long interconnects (&gt; 8-inches)</li></ul> <p>This release also includes the following tool fix:</p> <ul style="list-style-type: none"><li>• Correction to Drive Health reporting of NVMe products</li></ul>
May 2015	3.3.0	<p>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.</p>
July 2014	3.2.3	<p>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.</p>
February 2014	3.2.1	<p>This release of the Intel SSD Toolbox includes firmware updates for both Intel SSD DC S3700 and DC S3500 products with the following changes:</p> <ul style="list-style-type: none"><li>• 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.</li><li>• When a power-off is less than 500ms the drive will automatically reset and allow proper drive enumeration.</li><li>• Support for both 512B and 4KB physical sector size</li><li>• As blocks are retired, the SMART E8h value will decrease linearly.</li><li>• After a power cycle, timed workload variables will resume from the last saved values and update after 60 minutes and every minute thereafter.</li><li>• SMART Attribute 05h now has a normalized value of 100.</li><li>• SMART Attribute C2h now reports the correct temperature.</li></ul>



Date	Software Version	Description
December 2013	3.2.0	<p>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:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Corrects an occasional miss-reporting of SMART attribute E3h (Timed Workload Read/Write ratio).</li> <li>• The drive no longer increments SMART 0Ch (Power Cycle Count) after a SECURE ERASE operation.</li> </ul>
October 2013	3.1.9	<p>This release of the Intel SSD Toolbox includes the following improvements:</p> <ul style="list-style-type: none"> <li>• Support for new Intel SSD product names</li> <li>• Changed SMART attributes AF, BE, EA to represent RAW values in HEX while the breakouts of each attribute will be decimal.</li> <li>• Fixed an issue when a physical drive is missing from a storage space.</li> </ul>
August 2013	3.1.8	<p>This release of the Intel SSD Toolbox includes a firmware release which contains the following:</p> <ul style="list-style-type: none"> <li>• Intel® SSD 530 Series firmware update to DC12 which addresses an occasional drive hang after resume from Link Power Management slumber state.</li> </ul> <p>Other tool related items are:</p> <ul style="list-style-type: none"> <li>• Added new descriptions for SMART attributes C2, C5, EA and F9</li> <li>• Corrected calculations for E1, F1 and F2 SMART attributes.</li> <li>• Corrected the display of word 79 in the Drive Details screen</li> </ul>
July 2013	3.1.6	<p>This release contains the following:</p> <p>Intel® SSD DC S3500 Series firmware update to 0355 which:</p> <ul style="list-style-type: none"> <li>• Provides an update to the SMART Error Log after the download microcode command is executed.</li> <li>• Other ongoing improvements were made to address manufacturability and IOPs consistency.</li> </ul> <p>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.</p>



Date	Software Version	Description
June 2013	3.1.5	<p>This release contains the following:</p> <p>Intel® SSD DC S3700 Series firmware update to 0265 which fixes the following issues:</p> <ul style="list-style-type: none"> <li>• The drive may exhibit longer latency behind certain HBA/RAID cards under specific sequential workloads.</li> <li>• SMART attribute EAh was not correctly incrementing</li> <li>• The drive may return an incorrect response or become unresponsive to an LBA write above a 32-bit address</li> </ul> <p>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.</p> <p>This release adds the following tool updates:</p> <ul style="list-style-type: none"> <li>• Support for additional new Intel SSDs</li> <li>• Enhanced Optimizer scheduling functionality</li> <li>• Improved installation performance</li> <li>• Improved SMART Details output</li> <li>• Updated Drive Details output</li> </ul>
November 2012	3.1.2	<p>This release adds a firmware update for the Intel® SSD 335 Series fixing the following issue:</p> <ul style="list-style-type: none"> <li>• Incorrect reporting of the E9h media wear indicator value</li> </ul>
October 2012	3.1.1	<p>This release fixes a condition where some Intel® SSDs are being incorrectly reported as degraded.</p>
October 2012	3.1.0	<p>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.</p>
September 2012	3.0.5	<p>This release fixes an issue where all multi-language resource files were not displayed correctly.</p>
September 2012	3.0.4	<p>This release adds support for new Intel SSDs</p>
April 2012	3.0.3	<p>This release adds the following features:</p> <ul style="list-style-type: none"> <li>• Support for the Intel® SSD 330 Series</li> <li>• Definitions for SMART attributes B1h, B5h, B6h, and F9h</li> </ul> <p>This release corrects a bug where Identify Device word 214 was displaying the value for word 209.</p>
December 2011	3.0.2	<p>This release fixes the following issues:</p> <ul style="list-style-type: none"> <li>• Scheduled Intel SSD Optimizer sessions do not run on encrypted Intel SSDs</li> <li>• Intel® SSD Optimizer does not run if Microsoft Windows* compression is enabled on any partition</li> <li>• Intel® SSD 320 Series updates to incorrect version number on Lenovo* platforms (LE02 instead of LE04)</li> <li>• SMART details do not display if SMART is disabled in IDENTIFY DEVICE status on the drive.</li> </ul>



Date	Software Version	Description
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	<p>This release includes a new user interface and adds support for:</p> <ul style="list-style-type: none"> <li>• Updating firmware on supported Intel® SSDs</li> <li>• Viewing drive health</li> <li>• Viewing estimated drive life remaining</li> </ul> <p>This release also contains an integrated help system and adds support for multiple languages.</p>
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	<p>This release contains these new features:</p> <ul style="list-style-type: none"> <li>• System Configuration Tuner</li> <li>• Secure Erase</li> </ul>
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.