



## Intel® Memory and Storage Tool (GUI)

---

*Release Notes*

*October 2021*

*Software Version 1.11*

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

For copies of this document, documents that are referenced within, or other Intel literature, please contact your Intel representative.

All products, computer systems, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.

## Intel® Memory and Storage Tool Revision History

Date	Software Revision	Description
October 2021	1.11	Changes in revision 1.11 of the Intel® Memory and Storage Tool (Intel® MAS) CLI include: <ul style="list-style-type: none"> <li>• Firmware Update to E2010600 for Optane P4800X/P4801X Series for ESXi</li> <li>• Firmware Update to L0310200 for Optane P5800X Series for ESXi</li> <li>• Firmware Update to 2CV10201 for D7-P5500/P5600 Series</li> <li>• Firmware Update to JCV10200 for D7-P5510 Series</li> <li>• Firmware Update to ACV10200 for D5-P5316 Series</li> <li>• Added support for Windows 11, Windows Server 2022, ESXi 7.0.3, RHEL 8.3, 8.4, CentOS 8.3, 8.4</li> <li>• Fixed aggregation threshold error message</li> <li>• Resolved firmware update for some P4800X/P4801X Series products</li> </ul>
September 2021	1.10 v.2	<ul style="list-style-type: none"> <li>• Firmware Update for DC P4510, P4511, P4610 and P4618 Series</li> </ul>
August 2021	1.10	Changes in revision 1.10 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Firmware Update for Intel Optane SSD DC P4800X/P4801X Series for Windows and Linux</li> <li>• Firmware Update for DC P4510, P4610 and P4618 Series</li> <li>• Fixed bug of drive temperature reporting unknown if above 70 degree Celsius</li> </ul>
June 2021	1.9	Changes in revision 1.9 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Firmware Update for Non-Opal SKUs for P4510, P4610 and P4618 Series to VDV10182</li> <li>• Firmware Update to L0310200 for Intel® Optane™ SSD P5800X Series (400GB, 800GB, 1.6TB). Update for Windows and Linux only</li> <li>• Changed text for Firmware Update button</li> </ul>
May 2021	1.8	Changes in revision 1.8 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Allow firmware update for Intel Optane Memory H Series products when cache is enabled with RST Driver 17.9 and above</li> <li>• Fixed issue of diagnostic scan always performing quick scan</li> <li>• Updated Intel MAS license</li> </ul>
April 2021	1.7	Changes in revision 1.7 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Added ability to show SMART health log pages on non-Intel SSDs</li> <li>• Fix to allow H10 Series to update firmware individually if update is available for one component only</li> <li>• Update performance booster behavior to fully support 670P series</li> <li>• Updated handling of Secure Erase feature with RST Driver</li> <li>• Show RAID members in GUI when drives setup as MegaRAID. Added support for select MegaRAID adaptors</li> <li>• Fixed issue of scheduled optimize sessions not being removed from Windows scheduled list</li> <li>• Firmware Update for P4320, P4420 Series to 3DV10131 &amp; P4326 Series to 8DV10561</li> </ul>

Date	Software Revision	Description
February 2021	1.6	Changes in revision 1.6 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Fix for security state being incorrectly reported as Opal Activated on Intel Optane SSD 905P.</li> <li>• Display correct “Use Firmware Update Tool” message for applicable drives and firmware when attempting to update firmware.</li> <li>• Fix issue with Optimizer failing after Windows 20H2 update.</li> <li>• Updated FW version for few products</li> </ul>
January 2021	1.5	Changes in revision 1.5 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Removed Intel SSD Optimizer functionality for Intel Optane technology products (Feature is only supported on NAND based products)</li> <li>• SMART health log page parser updates</li> <li>• Add missing firmware update for 320 Series</li> <li>• Remove stale update notes in settings section of GUI</li> <li>• Updated Intel® Optane Memory H20 with Solid State Storage product family names</li> <li>• Added missing identify controller fields in support of Intel SSD 670p Series</li> </ul>
December 2020	1.4	<ul style="list-style-type: none"> <li>• FW information updated for Intel® SSD DC S3300</li> </ul>
November 2020	1.4	Changes in revision 1.4 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Only enable system tuner feature for SATA products</li> <li>• Fix issue showing enabled firmware update button regardless of firmware status</li> <li>• Add missing firmware update for 256 GB 660p Series SKU</li> <li>• Additional tweaks for progress and life remaining bar “look and feel”</li> <li>• Updated wording for CVE document (see Intel Advisory INTEL-SA-00362)</li> </ul>
October 2020	1.3	Changes in revision 1.3 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Fix Typo in Intel MAS Secure erase feature and fixed status of secure erase</li> <li>• Added firmware (FW) for Intel® Optane™ Memory H10 with Solid State Storage to FW G002-0440</li> <li>• SMART attribute description updates</li> <li>• Fix issue with Optimizer scheduler showing incorrect last run date</li> <li>• Fix issue incorrectly blocking Optimizer on some S4510 Series drives</li> <li>• Fix issue incorrectly retrieving identify namespace data on systems with Microsoft NVMe driver</li> </ul>
August 2020	1.2	Changes in revision 1.2 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include: <ul style="list-style-type: none"> <li>• Intel® Optane™ SSD DC P4800X Series FW update to FW 485 (for ESXi)</li> <li>• Update Intel® SSD D5-P4320 and Intel® SSD D5-P4326 firmware to 3DV10130 and 8DV10560 respectively</li> <li>• Fixed incorrect health status</li> <li>• Added Health data and value in Resources for each language</li> <li>• Fixed alignment of drive list</li> <li>• Use Native language names</li> <li>• Added “Give feedback” string</li> <li>• Fix incorrect health status calculation that caused preemptive health warning</li> <li>• Fixed issue of Mansion Beach drive FW update failures from E2010325</li> </ul>

Date	Software Revision	Description
July 2020	1.1	<p>Changes in revision 1.1 of the Intel® Memory and Storage Tool (Intel® MAS) GUI include:</p> <ul style="list-style-type: none"> <li>• Updated UI presentation and theme</li> <li>• Updated splash screen to approved Intel image</li> <li>• Updated temperature bar as accepted range (max is 70° C)</li> <li>• Temperature bar is now a gradient. As temperature reaches maximum bar will increasingly show red color</li> <li>• Updated estimated life remaining to reflect SMART info percentage used field</li> <li>• Updated setting popup window to align with core UI</li> <li>• Fixed BSOD related to performance booster feature</li> <li>• Fixed tool crash with feature dropdown menu</li> <li>• Add ability to copy/past basic drive info in drive summary page</li> <li>• Fix issue with incorrect temperature values reported on non-supported drives</li> <li>• Fix URL link pointing to latest tool download page</li> </ul> <p>This revision adds a firmware update for Intel® Optane™ Memory, Intel® Optane™ SSD 905P/900P, Intel® Optane™ SSD DC P4800X/P4801X, Intel® SSD D3-S4510/D3-S4610, DC S3100, DC P4101, E 6100p, E 5400s, E 5100s, Pro 7600p, Pro 6000p, Pro 5450s, Pro 5400s, 760p, 660p, and 540s.</p>
April 2020	1.0.5	<p>This is the first revision of the Intel® Memory and Storage (Intel® MAS Tool, GUI)</p> <p>This version of the tool contains both a Graphical User Interface (GUI) and a CLI (Command Line Interface) with the functionality to manage Client and Datacenter SSD's and Intel Optane Memory. See the User Guide for more information.</p>

**NOTE:** If you purchased your Intel SSD from an OEM, your firmware version may have a different naming sequence. Contact your local OEM representative for the latest firmware revisions.

## List of Intel® Solid State Drives

Solid State Drive	Latest Firmware Version(s)
Intel® Optane™ SSD P5800X	L0310200
Intel® Optane™ SSD DC P4800X	E2010600
Intel® Optane™ SSD DC P4801X	E2010600
Intel® Optane™ SSD 905P	E2010480
Intel® Optane™ SSD 900P	E2010480
Intel® Optane™ SSD 800P	K4110440
Intel® SSD D5-P5316	ACV10200
Intel® SSD D7-P5510	JCV10200
Intel® SSD D7-P5500	2CV10201
Intel® SSD D7-P5600	2CV10201
Intel® SSD DC P4500	QDV10170
Intel® SSD DC P4510	VDV10184 (U.2) VEV10284 (EDSFF)
Intel® SSD DC P4511	VCV10384 (M.2) VEV10284 (EDSFF)
Intel® SSD DC P4600	QDV10170
Intel® SSD DC P4610	VDV10184
Intel® SSD DC P4618	VDV10184
Intel® SSD D5-P4420	3DV10131
Intel® SSD D5-P4320	3DV10131
Intel® SSD D5-P4326	8DV10561
Intel® SSD DC P4101	008D
Intel® SSD DC P3520	MDV10291
Intel® SSD DC P3100	119D
Intel® SSD D3-S4620	7CV10100
Intel® SSD D3-S4520	7CV10100
Intel® SSD D3-S4610	XCV10132 (2.5-inch) XC311132 (M.2)
Intel® SSD D3-S4510	XCV10132 (2.5-inch) XC311132 (M.2)
Intel® SSD DC S4600	SCV10150
Intel® SSD DC S4500	SCV10150
Intel® SSD DC S3710	G2010170
Intel® SSD DC S3610	G2010170
Intel® SSD DC S3700	5DV12270
Intel® SSD DC S3520	N2010121
Intel® SSD DC S3510	G2010150
Intel® SSD DC S3500	Default: D2012370 M.2: G2010170 HD: G2010170
Intel® SSD DC S3300	D2012370
Intel® SSD DC S3100	043D
Intel® SSD E 6100p	005E

Solid State Drive	Latest Firmware Version(s)
Intel® SSD E 6000p	121E
Intel® SSD E 5400s	043E
Intel® SSD Pro 5400s	LBF017P
Intel® SSD E 5100s	LHF004E: 128 GB and 256 GB 2.5-inch/M.2 80mm LHFOAE3: 64 GB 2.5-inch/M.2 80mm
Intel® SSD Pro 7600p	005P
Intel® SSD Pro 6000p	131P
Intel® SSD Pro 5450s	LHF005P: 256 GB & 512 GB 2.5-inch/M.2 80mm LHF0B3P: 1 TB 2.5-inch
Intel® SSD Pro 5400s	043P 017P: 256 GB & 512 GB
Intel® SSD Pro 2500	M.2: TG16, 2.5-inch: TG21
Intel® SSD 760p	005C
Intel® SSD 750	Firmware: 8EV101H0 Bootloader: 8B1B0133
Intel® SSD 660p	004C
Intel® SSD 600p	121C
Intel® SSD 545s	LHF005C: 128 GB, 256 GB and 512 GB 2.5-inch/M.2 80mm LHF0B3C: 1 TB 2.5-inch
Intel® SSD 540s	043C 017C: 256 GB & 512 GB
Intel® SSD 535	M.2: RG11 2.5-inch: RG21
Intel® SSD 530	M.2: DC31, 2.5-inch: DC32, mSATA: DC33
Intel® SSD 335	335u
Intel® SSD 320	4PC10362
Intel® X25-E (50nm) SSD	045C8855
Intel® X18-M/X25-M (50nm) SSD	045C8820
Intel® X18-M/X25-M/25-V (34nm) SSD	2CV102M3

## List of Intel® Optane™ Memory Devices

Memory	Latest Firmware Version(s)
Intel® Optane™ Memory H20	Original Product Release Firmware, No Updates
Intel® Optane™ Memory H10	G002-0440
Intel® Optane™ Memory	K4110440

## Intel® Optane™ Memory H10 Revision History

Date	Revision	Description
September 2020	G002-0440	This firmware version has following fixes; <ul style="list-style-type: none"> <li>Complaint with Ice Lake (ICL) Platform</li> </ul>

## Intel® Optane™ SSD 905P/900P Revision history

Date	Revision	Description
July 2020	E2010480	<p>This firmware version has following fixes;</p> <ul style="list-style-type: none"> <li>• Fix for drive fails to set correct Native Max LBA when forcing max address capacity to smaller one</li> <li>• Fix for media errors + E2E error increments after coming back to the native capacity</li> <li>• Fix for drive sometimes fails PCIe training during reboots resulting in reduced link width or speed</li> <li>• Fix Link width degrades during link disable/enable on some platforms</li> <li>• Fix for Serial number is all zeroes after U.2 drive hotplug operation</li> <li>• Fix for Quality Reliability Test encountered Cold ECC Failure</li> <li>• “Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>

## Intel® Optane™ SSD DC P4800X/P4801X Revision History

Date	Revision	Description
August 2021	Windows / Linux – E2010600	P4800X/P4801X updates to MR5 firmware E2010600 for Windows / Linux (ESXi version will be released later)
August 2020	Windows/Linux - E2010485 ESXi - E2010485	Intel® Optane™ SSD DC P4800X Series FW update to FW 485 (for ESXi)
July 2020	Windows/Linux - E2010485 ESXi - E2010475	P4800X 375 GB AIC SKU now supported for upgrade
May 2020	Windows/Linux - E2010485 <sup>1</sup> ESXi - E2010475 <sup>1</sup>	<p>This revision adds the following firmware updates for Intel® Optane™ SSD DC P4800X/P4801X:</p> <ul style="list-style-type: none"> <li>• Windows/Linux - E2010485</li> <li>• ESXi - E2010475</li> </ul> <p><b>Note:</b> 1. P4800X 375 GB AIC SKU with firmware E2010211 will not support upgrade firmware to E2010475 or E2010485, this is targeted for a future release.</p> <ul style="list-style-type: none"> <li>• Minor Bug fixes and enhancements</li> </ul>
December 2019	E2010435	<p>The following changes are included in this firmware update:</p> <ul style="list-style-type: none"> <li>• QAN 9871</li> </ul>
February 2018	E2010324 (375 GB) EB3B0306 E2010325 (750 GB) EB3B0309	<p>The following changes are included in this firmware update:</p> <ul style="list-style-type: none"> <li>• Bug fixes from previous firmware on 375 GB (from FW: E2010320)</li> <li>• Note that 750 GB was qualified on firmware E2010325. There is no maintenance release past that FW. Additionally, there is limited applicability of this firmware on qual samples. Please reach out to Intel representative if your 750 GB samples are on earlier revision than FW E2010325.</li> </ul>

## Intel® Optane™ SSD P5800X Series Revision History

Date	Revision	Description
June 2021	Windows/Linux - L0310200 ESXi - L0310100	Intel® Optane™ SSD P5800X Series (400GB 800GB, 1.6TB) Series FW update to FW L0310200 for Windows and Linux.



## Intel® SSD D5-P4320, D5-P4420 and D5-P4326 Revision History

Date	Revision	Description
April 2021	3DV10131 8DV10561	Intel® SSD D5-P4320 D5 P4420 and Intel® SSD D5-P4326 firmware update to 3DV10131 and 8DV10561 respectively
August 2020	3DV10130 8DV10560	Intel® SSD D5-P4320 and Intel® SSD D5-P4326 firmware update to 3DV10130 and 8DV10560 respectively

## Intel® SSD D3-S4510 and D3-S4610 Revision History

Date	Revision	Description
July 2020	XCV10132 (2.5") XC311132 (M.2)	<p>XCV10132 (2.5-inch) – The following changes are included in this firmware update:</p> <ul style="list-style-type: none"> <li>In-field SMART CRC Error Count “C7h” attribute RESET capability with vendor unique command</li> <li>Built-in HOP-on capability for SMART structure mismatch issue with XCV10120 firmware</li> <li>MRR (Moving Read Reference) table updated to recover reads caused by corner case read-intensive workload</li> <li>Corrected LED blinking activity during Read Verify command</li> <li>Fixed condition causing a non-responsive state after soft-reboot following Windows installation</li> </ul> <p>XC311132 (M.2) – The following changes are included in this firmware update:</p> <ul style="list-style-type: none"> <li>In-field SMART CRC Error Count “C7h” attribute RESET capability with vendor unique command</li> <li>Built-in HOP-on capability for SMART structure mismatch issue with XC311120 firmware</li> <li>MRR (Moving Read Reference) table updated to recover reads caused by corner case read-intensive workload</li> <li>Corrected LED blinking activity during Read Verify command</li> <li>Fixed condition causing a non-responsive state after soft-reboot following Windows installation</li> </ul>
December 2019	XCV10120	MR2 Firmware Release

## Intel® SSD DC S3100 Revision History

Date	Revision	Description
July 2020	043D	This firmware version contains fix for following issue: <ul style="list-style-type: none"> <li>Optimizations for NAND data refresh algorithms</li> </ul>
March 2018	042D	This firmware version contains fixes for the following issues: <ul style="list-style-type: none"> <li>Fixed issue that, in some extreme cases, may result in user losing access to drive.</li> </ul>
May 2017	041D	This firmware versions contain the following enhancements: <ul style="list-style-type: none"> <li>Optimized SATA signal integrity</li> <li>Optimized behavior entering and resuming from low-power states</li> </ul> This firmware versions contain fixes for the following issues: <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> </ul> "Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a> )"
July 2016	036D	This firmware release provides the following change <ul style="list-style-type: none"> <li>Fixes issue that BSOD occurs during S3/S4 resume on systems supporting devsleep</li> </ul> Mitigates a security vulnerability which in some cases resulted in corruption of user's data (see Intel Advisory <a href="#">INTEL-SA-00055</a> )
June 2016	031D	This firmware release provides the following changes: <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>

## Intel® SSD DC S3300 Revision History

Date	Revision	Description
December 2020	D2012370	Firmware Release

## Intel® SSD DC P4101 Revision History

Date	Revision	Description
July 2020	008D	This firmware version contains following fixes: <ul style="list-style-type: none"> <li>Fixes SSD FW hang seen during D3 entry for Windows Modern Standby that may cause system timeout</li> <li>Improves power during D3 state for Windows Modern Standby</li> <li>Fixes SSD DRAM training error during FW boot that may cause system timeout during device low power resume</li> <li>Fixes stability of SSD during system boot causing occasional system timeout</li> <li>"Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)"</li> </ul>
December 2019	007D	MR2 Firmware Release

## Intel® SSD E 6100p Revision History

Date	Revision	Description
July 2020	005E	<p>This firmware contains the following fixes:</p> <ul style="list-style-type: none"> <li>Fixes SSD FW hang seen during D3 entry for Windows Modern Standby that may cause system timeout</li> <li>Improves power during D3 state for Windows Modern Standby</li> <li>Fixes SSD DRAM training error during FW boot that may cause system timeout during device low power resume</li> <li>Fixes stability of SSD during system boot causing occasional system timeout</li> <li>“Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
November 2018	004E	<p>This firmware version contains fixes for 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>

## Intel® SSD E 5400s Revision History

Date	Revision	Description
July 2020	043E	<p>This firmware version contains fix for following issue:</p> <ul style="list-style-type: none"> <li>Optimizations for NAND data refresh algorithms</li> </ul>
March 2018	042E	<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>
May 2017	041E	<p>This 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>This 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> </ul> <p>Mitigates a security vulnerability which in some cases resulted in corruption of user's data (see Intel Advisory <a href="#">INTEL-SA-00079</a>)</p>
July 2016	036E	<p>This firmware release provides the following change</p> <ul style="list-style-type: none"> <li>Fixes issue that BSOD occurs during S3/S4 resume on systems supporting devsleep</li> </ul> <p>Mitigates a security vulnerability which in some cases resulted in corruption of user's data (see Intel Advisory <a href="#">INTEL-SA-00055</a>)</p>
June 2016	031E	<p>This firmware release provides the following changes:</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>

## Intel® SSD E 5100s Revision History

Date	Revision	Description
July 2020	LHF004E LHFOA3E	This firmware version contains following fixes: <ul style="list-style-type: none"> <li>• “Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
October 2018	LHF003E LHFOA2E	This firmware version contains fixes for the following enhancements: <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> </ul> </li> </ul>

## Intel® SSD Pro 7600p Revision History

Date	Revision	Description
July 2020	005P	This firmware contains the following fixes: <ul style="list-style-type: none"> <li>• Fixes SSD FW hang seen during D3 entry for Windows Modern Standby that may cause system timeout</li> <li>• Improves power during D3 state for Windows Modern Standby</li> <li>• Fixes SSD DRAM training error during FW boot that may cause system timeout during device low power resume</li> <li>• Fixes stability of SSD during system boot causing occasional system timeout</li> <li>• “Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
September 2018	004P	This firmware version contains fixes for the following enhancements: <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>

## Intel® SSD Pro 6000p Revision History

Date	Revision	Description
July 2020	131P	This firmware contains the below fixes: <ul style="list-style-type: none"> <li>• “Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
May 2017	121P	This firmware versions contain the following enhancements: <ul style="list-style-type: none"> <li>• Improved link initializations</li> </ul> This firmware versions contain fixes for the following issues: <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>• Mitigates a security vulnerability <a href="#">INTEL-SA-00078</a></li> </ul>
December 2016	109P	This firmware versions contain the following enhancements: <ul style="list-style-type: none"> <li>• Improvements to PHY initialization process</li> <li>• Improved end of life management of bad blocks for better reliability</li> </ul> These firmware versions contain fixes for the following issues: <ul style="list-style-type: none"> <li>• Fixed potential issue of incorrect data may be read during resume from low power state</li> </ul>

## Intel® SSD Pro 5450s Revision History

Date	Revision	Description
July 2020	LHF005P LHF0B3P	This firmware version contains fix for the following issue: <ul style="list-style-type: none"> <li>“Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
October 2018	LHF004P LHF0B2P	This firmware version contains fixes for the following enhancements: <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> </ul> </li> </ul>

## Intel® SSD Pro 5400s Revision History

Date	Revision	Description
July 2020	043P/017P	This firmware has following fixes: <ul style="list-style-type: none"> <li>Optimizations for NAND data refresh algorithms</li> <li>“Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
March 2018	042P/016P	This firmware version contains fixes for the following issues: <ul style="list-style-type: none"> <li>Fixed issue that, in some extreme cases, may result in user losing access to drive.</li> </ul>
July 2017		Added support for 256 GB/512 GB SKUs: same firmware changes as listed below.
May 2017	041P/015P	This firmware versions contain the following enhancements: <ul style="list-style-type: none"> <li>Optimized SATA signal integrity</li> <li>Optimized behavior entering and resuming from low-power states</li> </ul> This firmware versions contain fixes for the following issues: <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 which in some cases resulted in corruption of user's data (see Intel Advisory <a href="#">INTEL-SA-00079</a>)</li> </ul>
March 2017		Added support for missing 80/120 GB SKUs – same firmware changes as listed below.
July 2016	036P	This firmware release provides the following changes: <ul style="list-style-type: none"> <li>Fixes issue that BSOD occurs during S3/S4 resume on systems supporting devsleep</li> <li>Fixes drive issues occurring when using WinMagic software with drive Opal security</li> <li>Mitigates a security vulnerability which in some cases resulted in corruption of user's data (see Intel Advisory <a href="#">INTEL-SA-00055</a>)</li> </ul>

## Intel® SSD 760p Revision History

Date	Revision	Description
July 2020	005C	<p>This firmware contains the following fixes:</p> <ul style="list-style-type: none"> <li>Fixes SSD FW hang seen during D3 entry for Windows Modern Standby that may cause system timeout</li> <li>Improves power during D3 state for Windows Modern Standby</li> <li>Fixes SSD DRAM training error during FW boot that may cause system timeout during device low power resume</li> <li>Fixes stability of SSD during system boot causing occasional system timeout</li> <li>“Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
September 2018	004C	<p>This firmware version contains 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>

## Intel® SSD 660p Revision History

Date	Revision	Description
July 2020	004C	<p>This firmware contains following fixes:</p> <ul style="list-style-type: none"> <li>“Fixes SSD FW hang seen during D3 entry for Windows Modern Standby that may cause system timeout</li> <li>Improves power during D3 state for Windows Modern Standby</li> <li>Fixes for drive NDA during heavy workload that may cause system timeout</li> <li>Fixes for FW hang cause by host request for device wake up when device transitioning between low power states</li> <li>“Mitigates security vulnerability (see Intel Advisory <a href="#">INTEL-SA-00362</a>)”</li> </ul>
August 2018	002C	<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>

## Intel® SSD 540s Revision History

Date	Revision	Description
July 2020	043C/017C	This firmware has the following fixes: <ul style="list-style-type: none"> <li>• Optimizations for NAND data refresh algorithms</li> </ul>
March 2018	042C/016C	This firmware version contains fixes for the following issues: <ul style="list-style-type: none"> <li>• Fixed issue that, in some extreme cases, may result in user losing access to drive.</li> </ul>
July 2017		Added support for 256 GB/512 GB SKUs: - same firmware changes as listed below.
May 2017	041C/015C	This firmware versions contain the following enhancements: <ul style="list-style-type: none"> <li>• Optimized SATA signal integrity</li> <li>• Optimized behavior entering and resuming from low-power states</li> </ul> This firmware versions contain fixes for the following issues: <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 which in some cases resulted in corruption of user's data (see Intel Advisory <a href="#">INTEL-SA-00079</a>)</li> </ul>
July 2016	036C	This firmware release provides the following changes: <ul style="list-style-type: none"> <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 Advisory <a href="#">INTEL-SA-00055</a>)</li> </ul>
June 2016	031C	This firmware release provides the following changes: <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>