

Intel® SATA Solid-State Drive Firmware Update Tool

Guidelines
Version 5



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1.0 Overview

This document describes how to update the firmware on the following Intel® Solid-State Drives (Intel® SSDs) in all capacities:

- Intel® Solid-State Drive 320 Series
- Intel® X18-M and X25-M SATA SSDs (34nm, silver case)
- Intel® X18-M and X25-M SATA SSDs (50nm, black case)
- Intel® X25-E SATA SSDs (50nm, black case)
- Intel® X25-V SATA SSDs (34nm, silver case)

For Microsoft Windows* and Linux* operating systems, follow the firmware update instructions in [Section 2, "Microsoft Windows* and Linux* Instructions"](#).

For Apple Mac OS* systems, follow the instructions in [Section 3, "Apple Macintosh* Instructions"](#).

The firmware update process involves four steps:

1. Perform the setup

Prior to updating the SSD firmware, perform such activities as backing up your data and closing all other applications.

2. Download the Firmware Update Tool to a blank CD (CD-R or CD-RW)

The tool is a self-contained firmware update package formatted as an ISO image, which must be downloaded and burned on a blank CD.

3. Run the Firmware Update Tool

When installed into a host system, the CD boots its own DOS environment and runs the necessary firmware update software to modify your Intel SSD.

4. Verify the update

Rescan your Intel SSDs to display the firmware information for each SSD—the data should match the firmware number identified in the *Release Notes* document.

1.1 System Requirements

To use the Firmware Update Tool, you need the following items:

- Supported Intel SSD
- Host system with a Read/Writable (R/W) CD-ROM drive
- ISO image burning software usually provided with the R/W CD-ROM drive
- Blank CD (CD-R or CD-RW)
- A charged battery, if the update occurs on a mobile system



1.2 Known Issues

1.2.1 RAID Platforms

The Firmware Update Tool does not support updating SSDs in systems using RAID. For RAID systems only, use the following instructions:

1. Back up your data before performing the following steps.
2. Perform the setup as described in [Section 2.1](#).
3. Burn the ISO image to a blank CD (CD-R or CD-RW).
4. Using BIOS, turn off RAID by enabling "Legacy" or "Compatibility" mode, save and reboot.

NOTE: RAID must be disabled by using BIOS to update Intel SSDs. Do not use Intel® Matrix Storage Manager, Intel® Rapid Storage Technology, or any other software-based RAID manager to disable the RAID option.

5. Run the Firmware Update Tool as described in [Section 2.3](#).
6. Verify the firmware update as described in [Section 2.4](#).
7. Using BIOS, re-enable RAID for both drives, save and reboot.

1.2.2 Lenovo* ThinkPad* T410 and T510, and IdeaPad* Y460

The Firmware Update Tool does not recognize Intel SSDs installed in Lenovo ThinkPad T410 and T510 systems and IdeaPad Y460 notebooks.

To enable the Firmware Update Tool to recognize an Intel SSD in these systems, change the drive mode from AHCI to IDE or Compatibility mode, and then start the firmware update. See [Section 5.2, "Change to IDE or Compatibility Mode on Specific Lenovo Systems"](#) for instructions.

1.2.3 Micro-Star International Company* (MSI) K9A2 Motherboard

If your system uses the MSI K9A2 motherboard, the Firmware Update Tool cannot detect SSDs on ports 3, 4, 5 and 6. Only ports 1 and 2 are visible. Place your SSD on port 1 or 2 before running the Firmware Update Tool.

1.2.4 USB CD-ROM Drives

In systems that use a USB-based CD-ROM drive, the system may not allow booting from the CD-ROM. Install a SATA-based CD-ROM drive and retry the firmware update.



2.0 Microsoft Windows* and Linux* Instructions

2.1 Perform the Setup

Complete the following steps before starting the firmware update process on the PC containing the SSD.

1. Back Up the SSD

Perform a complete system backup on your Intel SSD to ensure that no data is lost during the firmware update process. Intel is not responsible for any data loss that might occur during or after a firmware update on an SSD.

Following a successful firmware update, data restoration should not be required.

2. Plug in the Power

For mobile PCs, ensure the computer battery is fully charged. For desktop PCs, ensure the system is plugged into AC power during the update process. Do not remove power at any time during the firmware update process as this could produce incomplete results and may render your Intel SSD unusable.

3. Turn Off Drive Password Protection

Some systems provide the ability to password-protect their drives. If your system has password protection enabled, the Intel SSD may reject any requests from the host to update the firmware. You may need to turn off the drive password protection prior to beginning the firmware update process.

Although it varies from system to system, you can usually find the Drive Password Protection feature located in the BIOS. Consult your system documentation for the BIOS settings and passwords.

If you need help disabling the drive password protection feature, contact Intel Customer Support: <http://www.intel.com/go/ssdsupport>

4. Check the Boot Order

As a default, most systems boot from the CD-ROM drive before the system drive. To determine the boot order for your system, reboot and enter BIOS Setup. Depending on the BIOS vendor, look for a parameter named **Boot Device Priority** or **Boot Load Order**. Ensure that the system boots the CD-ROM drive before the drive that contains the operating system (OS).

For more information on how to set the CD-ROM drive boot order, consult the system documentation for your PC.

If you still need additional assistance checking the boot order, contact Intel Customer Support: <http://www.intel.com/go/ssdsupport>

5. Close Applications

Before beginning the firmware download process, close all applications except for your Internet browser.



2.2 Download the Firmware Update Tool to Blank CD

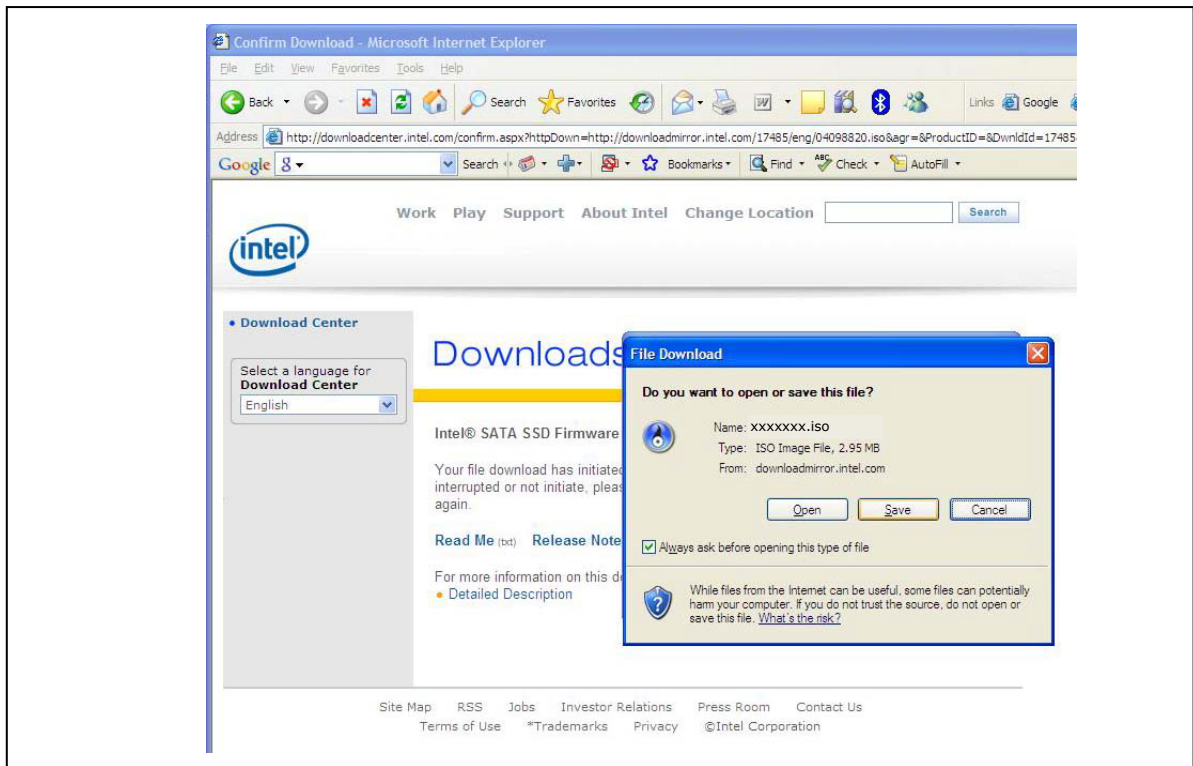
The Firmware Update Tool is packaged as an ISO image. Similar to an archive file or a disk image, an ISO image is specifically designed for optical disks like CDs in a format specified by the International Organization for Standardization (ISO).

You cannot simply copy an ISO image to a blank CD. (It will appear as a data file and will not work correctly.) The ISO image must be decoded with software and installed onto a blank CD (CD-R or CD-RW).

1. Go to the [Intel download website](http://www.intel.com/go/ssdfirmware) located at <http://www.intel.com/go/ssdfirmware>.
2. Review the *Read Me* file to better understand the firmware update process. The *Read Me* file contains high-level instructions for using the Firmware Update Tool.
3. Review the *Release Notes* document for a quick summary of the firmware changes for each product.
4. Click **Download** to display the terms of the license agreement. (The *Read Me.txt* file also includes the license agreement information.)
5. After reading the agreement, click **ACCEPT** to start the download.

The browser prompts you to select **Open**, **Save** or **Cancel**. See Figure 1 to view a sample screen.

Figure 1. Download the ISO Image



NOTE: Your screen will display the name of the current firmware update image file (xxxxxxx.iso).



6. Follow the steps for your operating system to burn the ISO image to a blank CD-R or CD-RW.

Windows* 7

- a) Click **Save** to download the file.
- b) Specify a folder location when prompted (such as c:\temp).
- c) Open the Windows **Start** menu, open the **Computer** folder, and go to the file folder you specified in the previous step.
- d) Right-click the .ISO file and select **Open With**.
- e) Select **Windows Disk Image Burner**.
- f) Insert a blank CD into your drive.
- g) Click **Burn**. The ISO image is burned to the CD.
- h) Click **Close** when finished.

Windows XP and Windows Vista*

Your Read/Write CD-ROM drive software will guide you through the process of burning an ISO image. For more information, see [Section 4.0, "Additional Information – Burning the ISO Image in Windows XP, Windows Vista or Linux OS."](#)

If your R/W CD-ROM software does not recognize ISO images, you may see an "unknown file type" message when downloading the Firmware Update Tool. See [Section 5.1, "Computer Does Not Recognize ISO Images"](#).

2.3 Run the Firmware Update Tool

After creating the ISO image CD, make sure you have completed the setup procedures before running the Firmware Update Tool:

- Back up the SSD
- Turn off Drive Password Protection
- Designate the CD-ROM drive to boot first or prior to the OS drive
- Fully charge the battery (for mobile computers)
- Plug in the power cable (for desktop computers)

Note: If at any time during the firmware update process the program fails or your system displays a blank screen, power down and reboot your computer. Run the firmware update process again. If the second attempt fails, contact Intel Customer Support: <http://www.intel.com/go/ssdsupport>



1. Insert the CD containing the ISO image into the R/W CD-ROM drive.
2. Click **Shutdown** from the Start menu to safely close down and power off the system.
3. Count to 10 (seconds) once the system is completely powered off.
4. Press the On button to boot the system from the CD-ROM drive and automatically load FreeDOS* and start the Firmware Update Tool.
5. Let the program run until it displays the DOS screen shown in Figure 2.

Figure 2. Initial Start Screen



6. Enter **"y"** and press **Enter** to indicate you have read the license agreement.
7. Enter **"y"** and press **Enter** again to **"....accept these terms of use (y/n)?:"**.
8. The tool scans your system for Intel SSDs and displays a screen similar to the one shown in Figure 3. If your system contains more than one Intel SSD, the tool displays the first one it encounters.

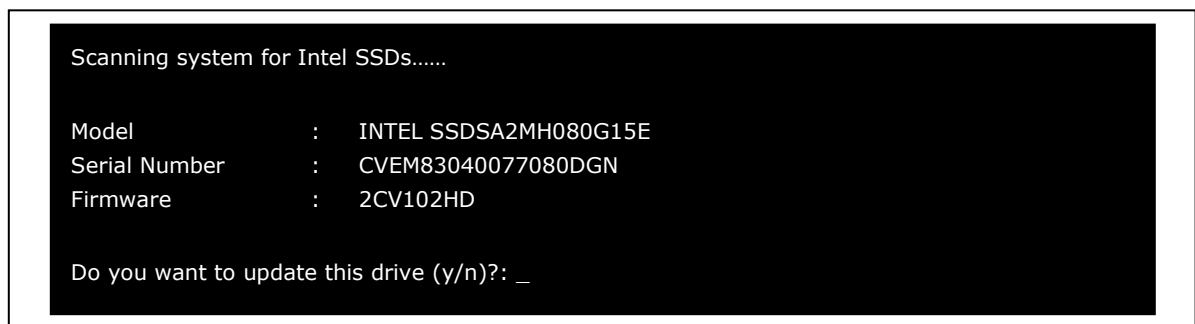
Note: If the tool does not find an Intel SSD, the following message appears:

Intel SSD is not attached or is disabled.

If you know an Intel SSD is installed and correctly connected to your system, please contact Intel Customer Support for further assistance at the following website:

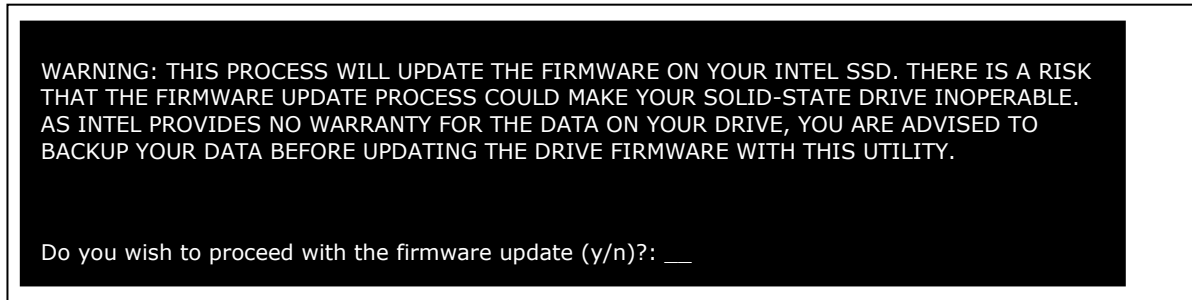
<http://www.intel.com/go/ssdsupport>.

Figure 3. Scanning for Intel SATA SSDs



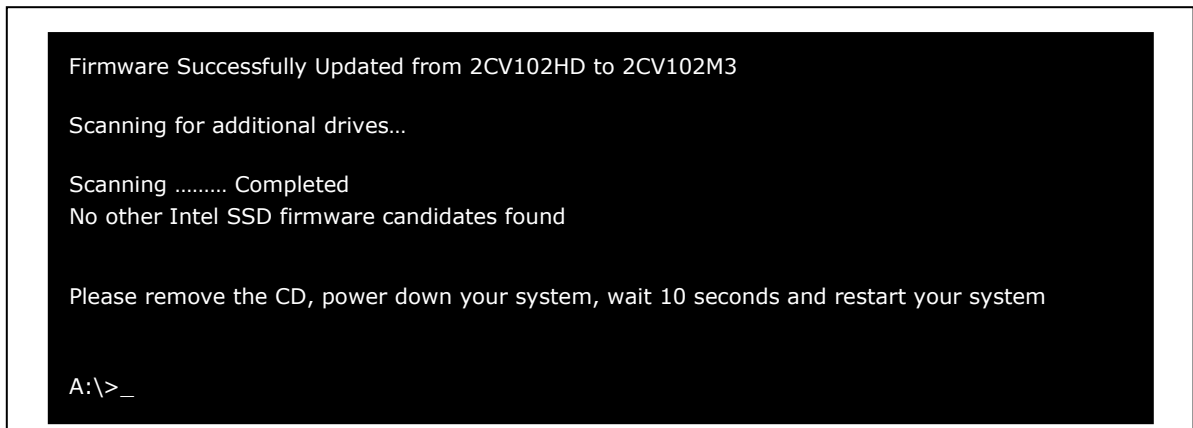
9. Enter **"y"** and press **Enter**. The tool displays a warning screen as shown in Figure 4.

Figure 4. Warning Screen



10. **It is critical that you do not remove power or reboot your system during this phase of the update.** Doing so will produce unpredictable results and may render your SSD inoperable.
Enter **"y"** and press **Enter** to proceed with the update. It will take from 30 seconds up to 2 minutes to update the firmware on the SSD.
11. Once the update is complete, the tool displays a screen similar to Figure 5.
12. Note the firmware number for the updated SSD — you will use this information to verify the firmware update (Step 6, Section 2.4). In the example below, you would record "2CV102M3".

Figure 5. Firmware Update Successful



Upon completing the firmware update, the tool scans your system for any other SSDs. If additional Intel SSDs are located, the tool lists the next Intel SSD requiring an update and prompts you to update it as well.

Repeat Steps 9 through 11 to update the firmware on each Intel SSD found in your system. Remember to record the new firmware number for each SSD updated.

13. When the firmware update is complete, remove the CD, power down the system, wait 10 seconds, and restart the system.
14. For computers running Windows 7, a message appears when the operating system starts that prompts you to restart the computer. Restart when prompted.

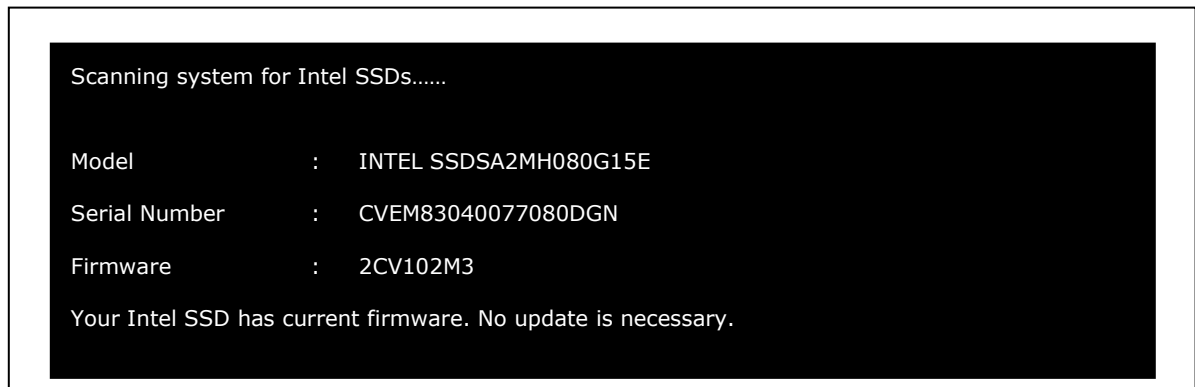


2.4 Verify New Firmware Update

You can use this optional, standalone process to verify that each Intel SSD installed in your system contains new firmware.

1. Check that the CD with the ISO image is still in the CD-ROM.
2. Shut down and power off the system.
3. Count to 10 (seconds) and reboot the system. This action reloads the Firmware Update Tool.
4. Enter "y" and press **Enter** to indicate you have read the license agreement.
5. Enter "y" and press **Enter** again to "...accept these terms of use (y/n)?:" to reactivate the scanning process. The **Firmware** field should display the current firmware for your SSD listed in the Release Notes.

Figure 6. Scanning for Additional Intel SATA SSDs



6. The tool displays the firmware for each SSD. Verify that the firmware number is correct for each SSD. Refer to the number(s) provided during Step 12 in Section 2.3.

The firmware update process is now complete.

7. If applicable, see Step 7 under Section 1.2.1 "RAID Platforms to restore RAID" (if you previously changed the mode to "Legacy" or "Compatibility") on your system.
8. Restart your system. Your system should now boot from the SSD and the native OS should load.

Note: In Windows 7, if you have just completed an update and have not started the operating system since the update, you will be prompted to restart your system. Restart when prompted.



3.0 Apple Macintosh* Instructions

3.1 Perform the Setup

Complete the following steps before starting the firmware update process on the computer containing the SSD.

1. Back Up the SSD

Perform a complete system backup on your Intel SSD to ensure that no data is lost during the firmware update process. Intel is not responsible for any data loss that might occur during or after a firmware update on an SSD.

Following a successful firmware update, data restoration should not be required.

2. Plug In the Power

For mobile computers, ensure the computer battery is fully charged. For desktop computers, ensure the system is plugged into AC power during the update process. Do not remove power at any time during the firmware update process as this could produce incomplete results and may render your Intel SSD unusable.

3. Close Applications

Before beginning the firmware download process, close all applications except for your Internet browser.

3.2 Download the Firmware Update Tool to Blank CD

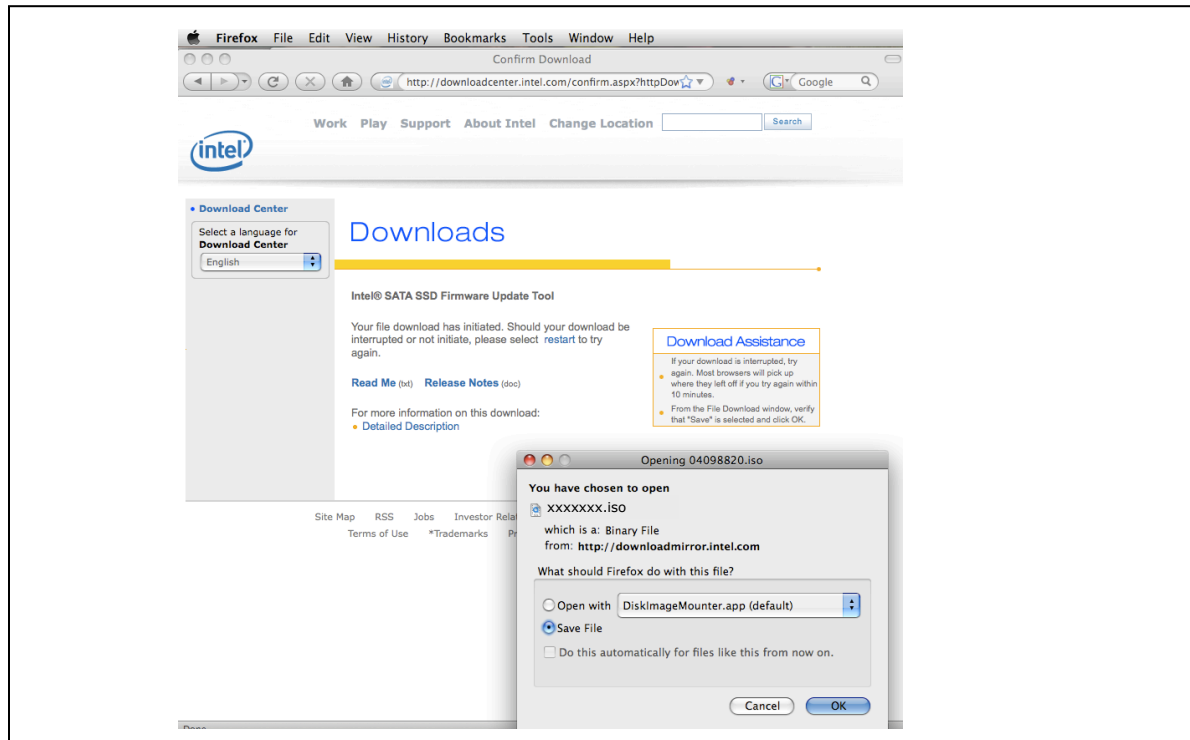
The Firmware Update Tool is packaged as an ISO image. Similar to an archive file or a disk image, an ISO image is specifically designed for optical disks like CDs in a format specified by the International Organization for Standardization (ISO).

You cannot simply copy an ISO image to a blank CD. (It will appear as a data file and will not work correctly.) The ISO image must be decoded with software and installed onto a blank CD (CD-R or CD-RW).

1. Go to the [Intel download website](http://www.intel.com/go/ssdfirmware) located at <http://www.intel.com/go/ssdfirmware>.
2. Review the *Read Me.txt* file to better understand the firmware update process. The *Read Me* file contains high-level instructions for using the Firmware Update Tool.
3. Review the *Release Notes* document for a quick summary of the firmware changes for each product.
4. Click **Download** to display the terms of the license agreement. (The *Read Me.txt* file also includes the license agreement information.) After reading the agreement, click **ACCEPT** (at the bottom of the page) to display the web page with the download firmware link.
5. Click **Intel® SATA SSD Firmware Update Tool**. The browser prompts you to select **Open**, **Save** or **Cancel** (see Figure 7).



Figure 7. Download the ISO Image

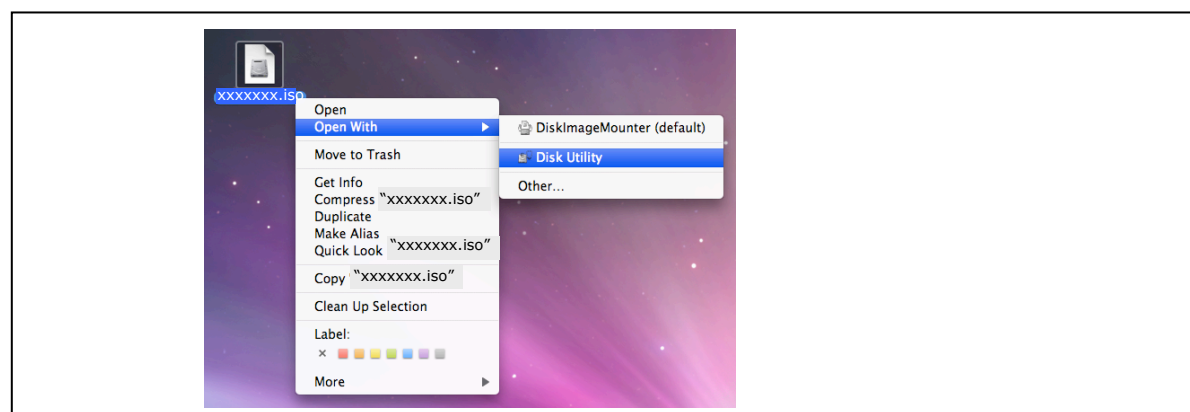


NOTES:

1. Mozilla Firefox* was used only as an example to create this screen shot and does not imply any endorsement or warranty by Intel.
2. Your screen will display the current name of the firmware update image file (xxxxxxx.iso).

6. Click **Save File** to download and save the ISO image.
7. Right click the ISO image and open **Disk Utility**. See Figure 8.

Figure 8. Selecting Disk Utility

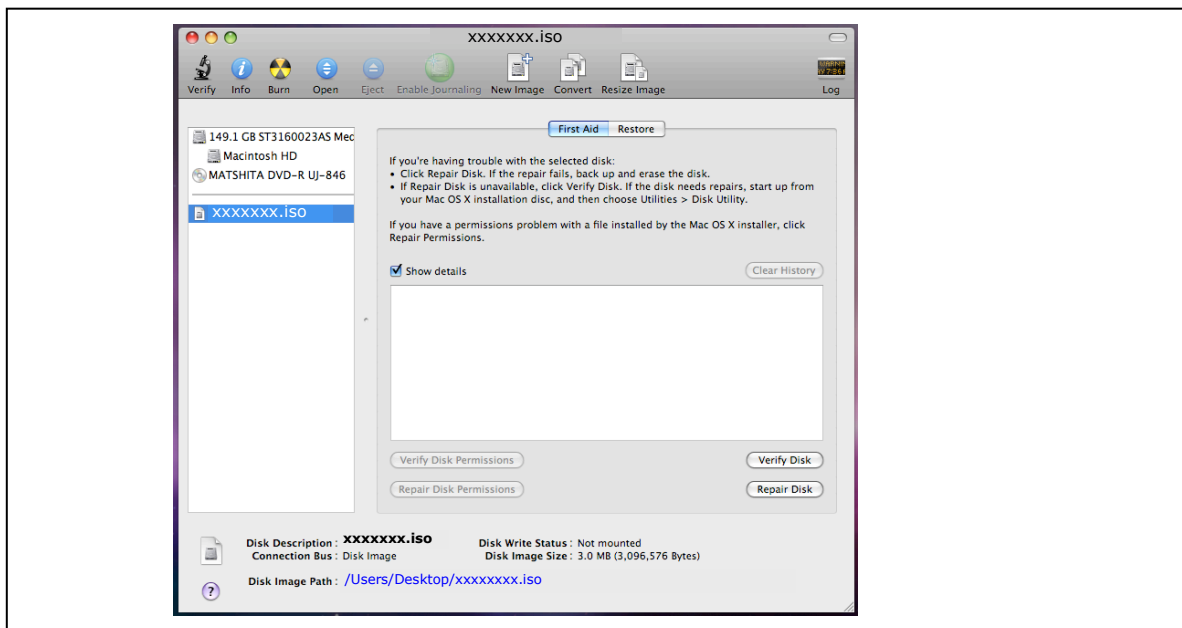


NOTES:

1. These Apple* products were used only as examples to create this screen shot and do not imply any endorsement or warranty by Intel.
2. Your screen will display the current name of the firmware update image file (xxxxxxx.iso).

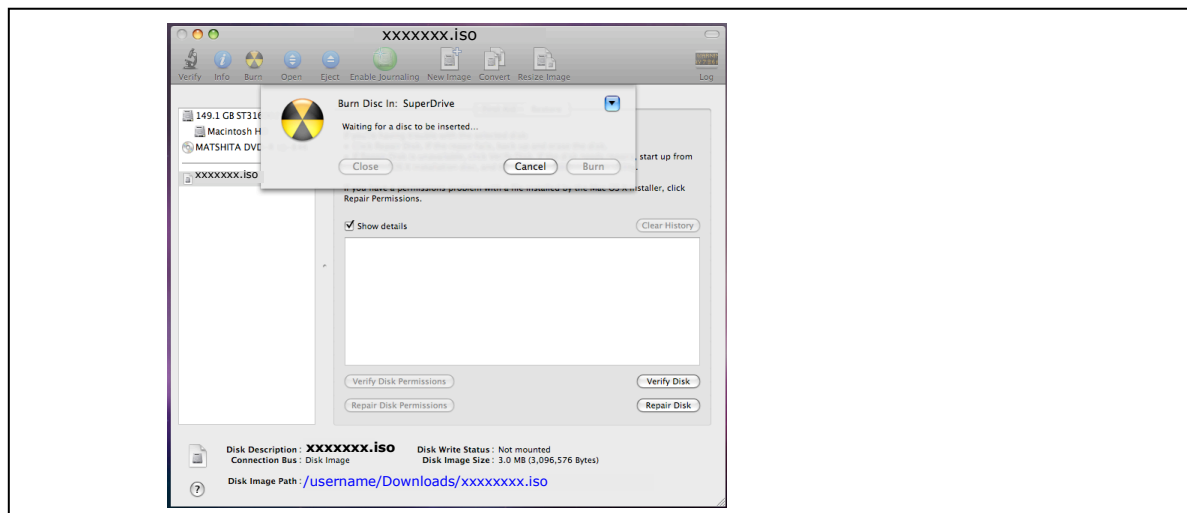
8. With the Disk Utility open, click the ISO image you downloaded.
9. Click the **Burn** button in the toolbar.

Figure 9. Using Disk Utility to Burn ISO Image



10. Install a blank CD (CD-R or CD-RW) when prompted.
11. Click the **Burn** button. The application displays a status screen similar to Figure 10.

Figure 10. Image Burning Process – Apple Mac OS*



NOTES:

1. The Apple* and Matsushita* products were used only as examples to create the screen shots on this page and do not imply any endorsement or warranty by Intel.
2. Your screen will display the current name of the firmware update image file (xxxxxxx.iso).

The process of burning a CD-ROM takes approximately five minutes.



3.3 Start the Firmware Update Process

After creating the ISO image CD, make sure you have completed the setup procedures before starting the firmware update process:

- Back up the SSD
- Fully charge the battery (for mobile computers)
- Plug in the power cable (for desktop computers)

Go to [Section 2.3, "Run the Firmware Update Tool"](#) and follow the steps to update the firmware. Use [Section 2.4, "Verify New Firmware Update"](#) to confirm that your Intel SSD contains the new firmware (this is an optional step).

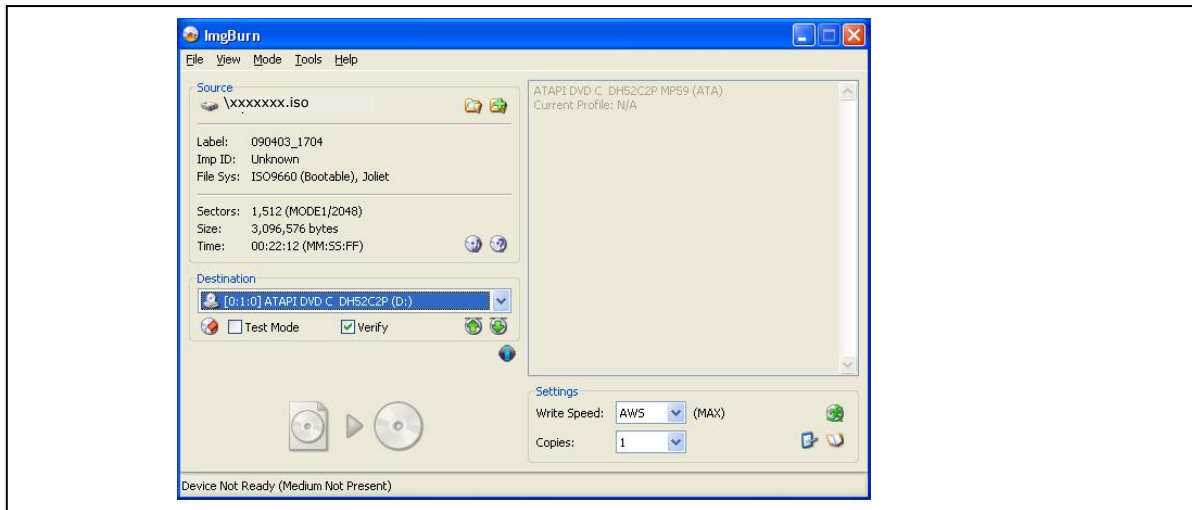
Note: Hold down the "c" key to force your system to boot from the CD-ROM drive.

4.0 Additional Information – Burning the ISO Image in Windows XP*, Windows Vista* or Linux* OS

This section describes how to burn the Firmware Update Tool ISO image file on a blank CD (CD-R or CD-RW) using Microsoft Windows XP, Windows Vista, or Linux after you have downloaded the file (as described in [Section 2.2](#)).

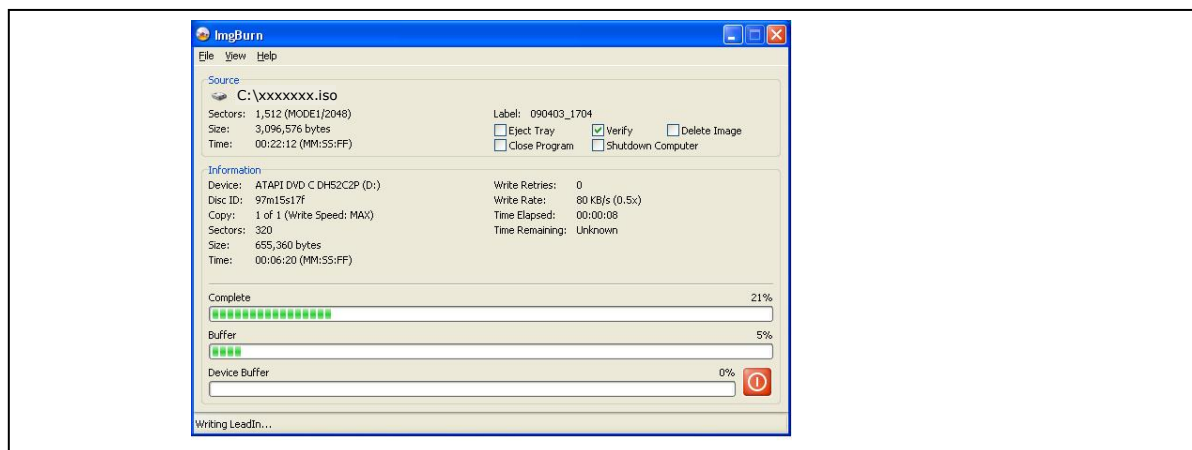
Once the download process begins, you may see a screen similar to the one shown in Figure 11.

Figure 11. Burning an ISO Image



1. Install a blank CD when prompted.
2. Click the **Burn** button to start the process. A status screen similar to Figure 12 appears. The process of burning a CD-ROM takes approximately five minutes.

Figure 12. Image Burning Process



NOTES:

1. The ImgBurn* and ATAPI DVD* products displayed on this page were used only as examples to create these screen shots and do not imply any endorsement or warranty by Intel.
2. Your screens will display the current name of the firmware update image file (xxxxxxx.iso).

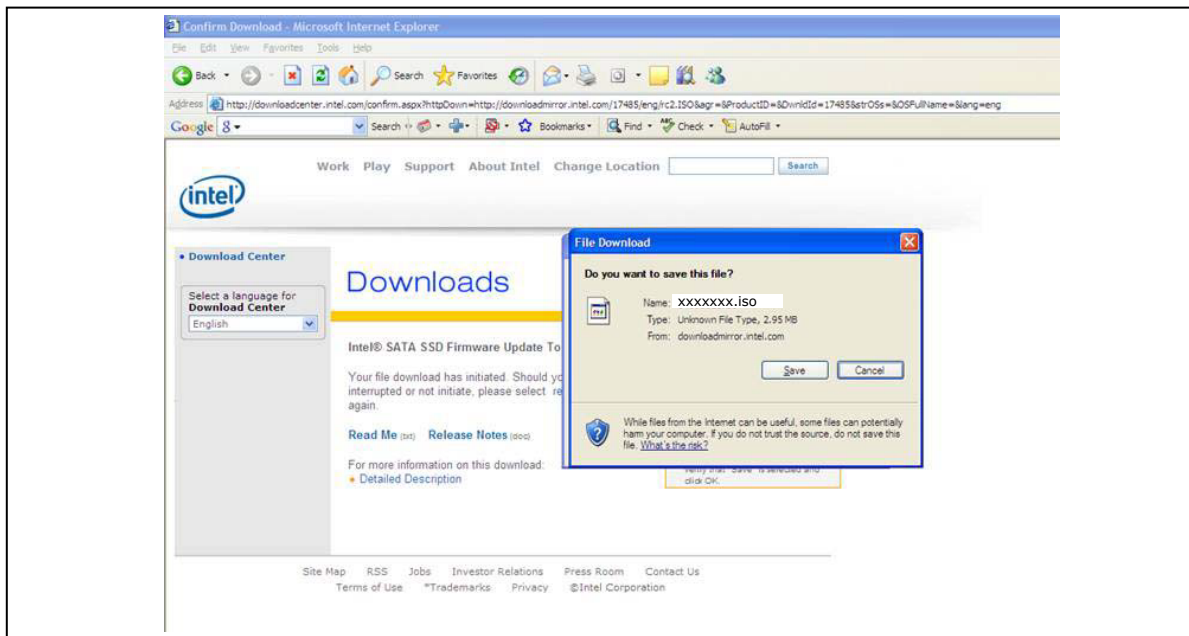


5.0 Troubleshooting

5.1 Computer Does Not Recognize ISO Images

If your CD-ROM software does not recognize ISO images (in Windows XP, Windows Vista, or Linux operating system), you may see an “unknown file type” message when downloading the Firmware Update Tool similar to Figure 13.

Figure 13. R/W CD-ROM Software Does Not Recognize ISO Images



1. Click **Save** to download the ISO image to your computer.
2. Locate a software application on the Internet that burns ISO images. Install the application.
3. Double-click the ISO image on your drive to decode the image and burn the Firmware Update Tool onto a blank CD (CD-R or CD-RW).



5.2 Change to IDE or Compatibility Mode on Specific Lenovo* Systems

The Firmware Update Tool does not recognize Intel SSDs installed in Lenovo ThinkPad T410 and T510 systems and IdeaPad Y460 notebooks.

To enable the Firmware Update Tool to recognize an Intel SSD in these systems, change the drive mode from AHCI to IDE or Compatibility mode, and then start the firmware update process.

ThinkPad T410 and T510

1. Enter BIOS configuration.
 - a. Press the ThinkVantage button when prompted on screen.
 - b. Press F1 to enter Setup.
2. Select **Config**, and then **Serial ATA**.
3. Select **SATA Controller Mode Option**.
4. Highlight **Compatibility**, and then press Enter.
5. Press F10 and select **Yes** when prompted to "Save configuration changes and exit now?"

The system reboots.

6. Start the firmware update process. See [Section 2.3](#) for instructions.

IdeaPad Y460

1. Enter BIOS configuration by pressing F2 when prompted on screen.
2. Select **Configuration** tab.
3. Select **SATA Mode**.
4. Highlight **IDE** and press Enter.
5. Press F10 and select **Yes** when prompted to "Save configuration changes and exit now?"

The system reboots.

6. Start the firmware update process. See [Section 2.3](#) for instructions.



6.0 Reference Documents

Table 1. Reference Documents

Document	Document No./Location
Intel® Solid-State Drive 320 Series Product Specification	325152
Intel® X18-M/X25-M SATA Solid-State Drive – 34nm Product Line Product Manual	322296
Intel® X18-M/X25-M SATA Solid-State Drive Product Manual	319765
Intel® X25-E SATA Solid-State Drive Product Manual	319984
Intel® X25-V SATA Solid-State Drive Product Manual	322736

7.0 Glossary

Table 2. Terms and Acronyms

Term	Description
ATA	Advanced Technology Attachment
ISO	International Organization for Standardization
ISO image	An archive file or disk image of an optical disk that uses the ISO format. Typically, the file has an .ISO extension; however, Apple Mac OS* ISO images often use a .CDR extension.
OS	Operating System
RAID	Redundant Array of Independent Disks (formerly Redundant Array of Inexpensive Disks)
SATA	Serial ATA
SSD	Solid-State Drive

8.0 Revision History

Date	Revision	Description
August 2011	005	Added support for Intel® Solid-State Drive 320 Series. Miscellaneous documentation changes.
January 2011	004	Updated document to reflect new firmware release.
November 2009	003	Modified graphics version information. Modified instructions in Run the Firmware Update Tool section. Modified instructions in Verify New Firmware Update section.
October 2009	002	Deleted the Apple Safari* content from Known Issues section. The Intel SATA SSD Firmware Update Tool now works with this website. Modified various graphics to reflect the new 1.3 firmware release.
August 2009	001	Initial release.