USER GUIDE

Solidigm™ Bootable Firmware Update Tool (SFUT)

May 2022

SOLIDIGM™

Revision History

Document Revision	Software Version	Description	Revision Date
001	1.0	• Initial Release	May 2022

Contents

Glossary of Terms

Term	Description
ATA	Advanced Technology Attachment
FUT	Solidigm™ Bootable Firmware Update Tool
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

1   Overview

This document describes how to use the Solidigm™ Bootable Firmware Update Tool (SFUT) to update the firmware on Solidigm™ SSDs including Intel® NAND SSDs.

Note:

- Before initiating the update, be sure to read and follow the instructions included in the Firmware update guidelines, and release notes.

- The Firmware update process is done entirely at your own risk. Before attempting to update the firmware, it is your responsibility to back up or make copies of your files. If the SSD firmware update process is interrupted, your SSD may not function properly.

- The Solidigm™ Bootable Firmware Update Tool recognizes all Intel® NAND and Solidigm™ SSDs, but if there is no updated firmware available for a specific model, the tool does not provide any functionality.

- For a listing of the latest Firmware on all products, please see the Firmware listing page. While the latest firmware might appear on the Firmware listing page, this tool may not yet be updated to provide the Firmware update. Please check the release notes to confirm the Firmware update is available in this tool.

- If you need any assistance with the firmware update or experience issues, please contact Intel Customer Support.

- This download contains both Solidigm™ proprietary software and an open-source Linux operating environment. The Solidigm proprietary software is licensed under the Solidigm™ Software License Agreement only. The components of the open-source Linux operating environment provided in this download are licensed under the GNU L/GPL and other licenses as applicable. These licenses are included in the "licenses" folder in the download image. You can see the source code for this open source operating environment.

1.1   Solidigm™ Bootable Firmware Update Tool (SFUT) Usage

Use this section to decide if SFUT is the best option for your scenario.

Solidigm Storage Tool (SST) is another Solidigm tool that provides firmware updates. SST is a full featured tool, and it is recommended for most firmware update scenarios. SST supports Windows, Linux, and ESXi. Solidigm Storage Tool provides additional functionality and features besides Firmware Update. SST is updated more frequently.

Use Solidigm Bootable Firmware Update for:

- Any Operating System that is not supported by Solidigm Storage Tool include Apple based OS.

- System cannot boot to supported OS for any reason.

- Intel® SSD 540s Series, Intel® SSD Pro 5400s Series, Intel® SSD E 5400s Series, and the Intel® SSD DC S3100 Series products, updating from the original production Firmware. As firmware update from those firmwares is only available through the Solidigm™ Bootable Firmware Update Tool.

Do not use Solidigm Bootable Firmware Update:

- If you purchased your Intel® or Solidigm™ SSD from an Original Equipment Manufacturer (OEM), your Firmware version may have different naming. Contact your local OEM representative for latest Firmware revisions.

1.2 System Requirements

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

- Supported Intel®/Solidigm™ SSD (that needs an update)
- Host system with an available USB port or a Read/Writable (R/W) CD-ROM drive
- ISO image burning software usually provided with the R/W CD-ROM drive, or freely available online
- Blank USB Flash Drive or blank CD (CD-R or CD-RW)
- A charged battery if the update occurs on a mobile system

1.3 Known Compatibility Issues

1.3.1 Run Compatibility Issue with Secure Boot Enabled

As the tools is a bootable solution, the tool may have compatibility issues with some systems when Secure Boot is Enabled.

1.3.2 Boot Compatibility Issues

As the tools is a bootable solution, the tool may have compatibility issues with certain boot configurations and or BIOS.

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2 Updating firmware with SFUT

2.1 Steps

The firmware update process involves three 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 Solidigm™ Bootable Firmware Update Tool to a USB Flash Drive or 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 USB flash drive or blank CD-R.

3. **Run the Solidigm™ Bootable Firmware Update Tool**

   When installed into a host system, the CD boots its own custom Linux-based environment and runs the necessary firmware update software to modify your supported SSD.

For Microsoft Windows and Linux operating systems, follow the firmware update instructions in Section "Windows 7/8/10 Instructions".

For Apple Mac OS systems, follow the instructions in Section "Apple Mac Instructions."

For Linux OS systems, follow the instructions in Section "Linux Instructions".

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3 Windows 7/8/10 Instructions

3.1 Setting Up

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 SSD to ensure that no data is lost during the firmware update process. Solidigm 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 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 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 Customer Support: http://www.intel.com/go/ssdsupport

4. **Check the Boot Order**

   This procedure requires booting from a USB flash or 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 USB flash, or 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/Solidigm 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.

3.2 Option 1: Download the Solidigm™ Bootable Firmware Update Tool to USB Flash Drive

The Solidigm™ Bootable 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).

This means that you cannot simply copy an ISO image to a blank USB Flash Drive. (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 USB Flash Drive to make it bootable with the Solidigm™ Bootable Firmware Update Tool.

Note: Along with the steps below, a video of this process can be found at the link below:

[How to Update Firmware on supported SSDs with the Solidigm™ Bootable Update Tool](#)

For the purpose of illustration, we are using Universal USB installer software from pendrivelinux.com, but you may use any installer that you prefer.

1. Go to the download website 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 Solidigm™ Bootable Firmware Update Tool.

3. Review the SSD *Firmware 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.**

6. Go to http://www.pendrivelinux.com/universal-usb-installer-easy-as-1-2-3/ and download the freeware Universal USB Installer.

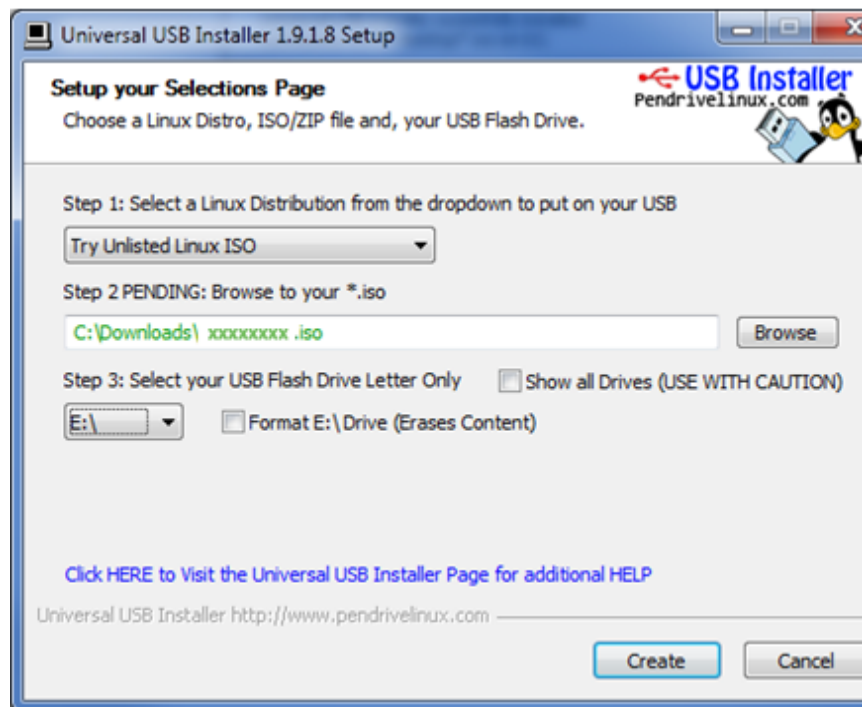7. Install and run the Universal USB Installer (see Figure 2).

Figure 2. Universal USB Installer

> *Note:* Your screen will display the name of the current firmware update image file (xxxxxxxx.iso).

8. Select the Try Unlisted Linux ISO.
9. Browse to the location of the FUT ISO and select it.
10. Select the drive letter that corresponds to your blank USB Flash Drive.
11. Click **Create**.

3.3 Option 2: Download the Solidigm™ Bootable Firmware Update Tool to Blank CD

The Solidigm™ Bootable 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 download website located at http://www.intel.com/go/ssdfirmware.

2. Review the SSD *Firmware Release Notes* document for a quick summary of the firmware changes for each product.

3. Click **Download** to display the terms of the license agreement.

4. After reading the agreement, click **ACCEPT** to start the download. The browser prompts you to select **Open**, **Save** or **Cancel**.

5. Following are the steps to burn the ISO image to a blank CD-R or CD-RW for your operating system.

Windows 8/10

a) Insert a blank CD into your drive

b) Click **Save** to download the file

c) Specify a folder location when prompted (such as c:\temp)

d) Press the **Windows key** on your keyboard to go to the desktop, then click the **File Explorer** icon on the taskbar

e) Navigate to the file folder you specified in **step b**

f) Right-click the .ISO file and select **Burn disc image**

g) Click **Burn**. The ISO image is burned to the CD

h) Click **Close** when finished

Windows 7

a) Insert a blank CD into your drive

b) Click **Save** to download the file

c) Specify a folder location when prompted (such as c:\temp)

d) Open the Windows **Start** menu, open the Computer folder, and go the file folder you specified in the previous step

e) Right-click the .ISO file and select **Open With**

f) Select **Windows Disk Image Burner**

g) Click **Burn**. The ISO image is burned to the CD

h) Click **Close** when finished

3.4   Run the Solidigm™ Bootable Firmware Update Tool

After creating the ISO Image bootable USB flash drive or CD, make sure you have completed the setup procedures before running the Solidigm™ Bootable Firmware Update Tool:

- Back up the SSD

- Turn off Drive Password Protection

- Designate the USB Flash drive or CD-ROM (as appropriate) 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. Tool will boot and present the end-user software license. You will need to press "enter" to continue and read fully. Here is a sample text:

```
================================================
Solidigm(TM) Bootable Firmware Update Tool
Version:  1.0 Build:001
Copyright(c) 2022 Solidigm
================================================

Copyright (C) Solidigm 2022. All Rights Reserved.
Solidigm Software License Agreement
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
DO NOT DOWNLOAD, INSTALL, ACCESS, COPY, OR USE ANY PORTION OF THE SOFTWARE UNTIL YOU HAVE
READ AND ACCEPTED THE TERMS AND CONDITIONS OF THIS AGREEMENT.BY INSTALLING, COPYING,
ACCESSING, OR USING THE SOFTWARE, YOU AGREE TO BE LEGALLY BOUND BY THE TERMS AND
CONDITIONS OF THIS AGREEMENT. If You do not agree to be bound by, or the entity for whose
benefit You act has not authorized You to accept, these terms and conditions, do not
install, access, copy, or use the Software and destroy all copies of the Software in Your
possession.

This SOFTWARE LICENSE AGREEMENT(this 'Agreement') is entered into between SK hynix NAND
Product Solutions Corp. (DBA Solidigm), a  Delaware corporation('Solidigm') and You.'You'
refers to you or your employer or other entity for whose benefit you act, as applicable.
If you are agreeing to the termsand conditions of this Agreement on behalf of a company or
other legal entity, you representand warrant that you have the legal authority to bind
that legal entity to the Agreement, in which case, 'You' or 'Your' shall be in reference
to such entity. Solidigm and You are referred to herein individually as a 'Party' or ,
together, as the 'Parties'.

Press enter to continue...
```

2. Once you click through and read the license the tool will prompt the user:

```
================================================
Solidigm(TM) Bootable Firmware Update ToolVersion:  1.0.001
Copyright(c) 2022 Solidigm
================================================


Do you accept the License? (Y|N):
```

   a. If the user declines the license agreement the tool will show the shutdown prompt.

   b. If user says "y" to the license prompt, then the tool will scan for SSDs.

3. If the drive does not need a firmware update it will show that firmware is current as of this tool release:

```
================================================
Solidigm(TM) Bootable Firmware Update Tool
Version:  1.0 Build: 001
Copyright(c) 2022 Solidigm
================================================


------------------------------------------------------------------
Series:                 Intel SSD
Model:                  INTEL SSDSC2BA80
Current Firmware:       0170
------------------------------------------------------------------


--> The selected drive contains current firmware as of this tool release.


------------------------------------------------------------------
Series:                 Intel SSD
Model:                  INTEL SSDSC2BB96
Current Firmware:       0111
------------------------------------------------------------------


--> The selected drive contains current firmware as of this tool release.
```

Note: The message displayed above could change depending on why the drive doesn't need an update. It could be because the drive is an invalid SKU or in a disable logical state.

4. If the drive does need an update, it will show New Firmware, as below:

```
================================================
Solidigm(TM) Bootable Firmware Update Tool
Version:  1.0 Build:001
Copyright(c) 2022 Solidigm
================================================


------------------------------------------------------------------
Series:                 Intel SSD
Model:                  INTEL SSDSC2BA80
Current Firmware:       0170
------------------------------------------------------------------


New Firmware:           0171

This process will update the firmware on your SSD.
It is strongly suggested to  perform the firmware update while the drive is fully powered or
attached to an active power source to avoid certain risks to the drives performance.
As Solidigm provides no warranty for the data on your drive,
you are advised to backup your data BEFORE updating the drive firmware with this utility.

Proceed with the Firmware Update?
```

a. If the user says "n" (no) to the update, the update for that drive will be skipped.

b. If the user says "Y" yes, the tool will update the firmware on that drive. Result of the update will be displayed.

c. After it will go to the next supported SSD and show the next drive. Displaying if no update is needed or if there is an update.

5. Once the Tool has gone through all the drives it will show the shutdown prompt

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4   Linux Instructions

4.1   Setting Up

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 SSD that needs an update to ensure that no data is lost during the firmware update process. Solidigm 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 SSD unusable.

3.   **Close Applications**

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

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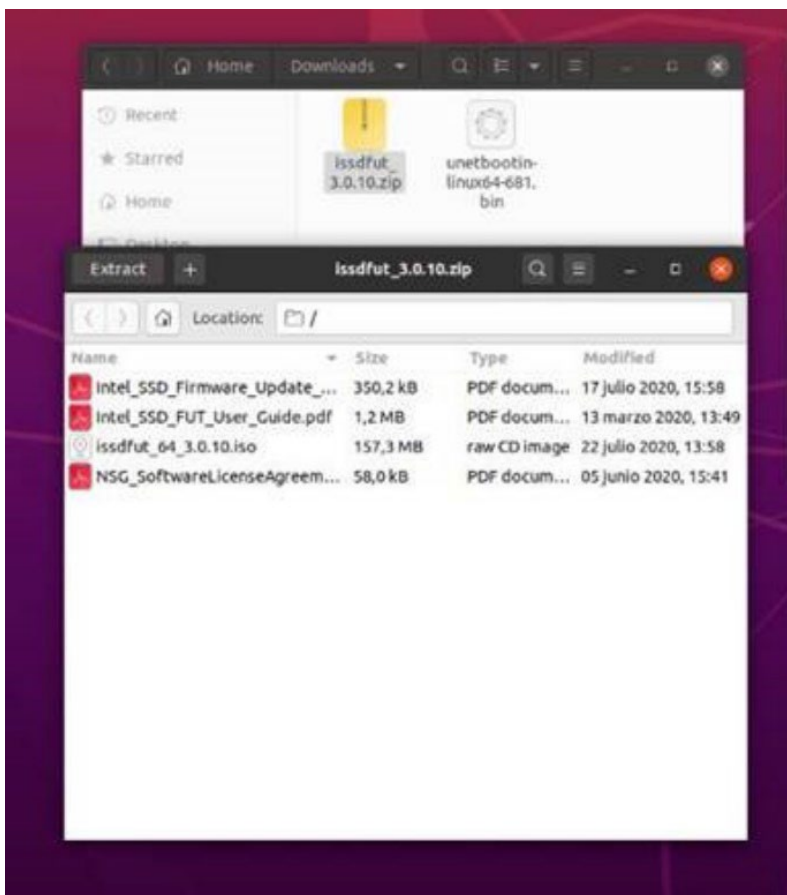
The Solidigm™ Bootable Firmware Update Tool is packaged as an ISO image. Similar to an archive file or a disk image, an ISO image is specifically designed for optical disks like CDs in a format specified by the International Organization for Standardization (ISO).

You cannot simply copy an ISO image to a USB drive. (It will appear as a data file and will not work correctly.) The ISO image must be decoded with software and installed onto a USB drive
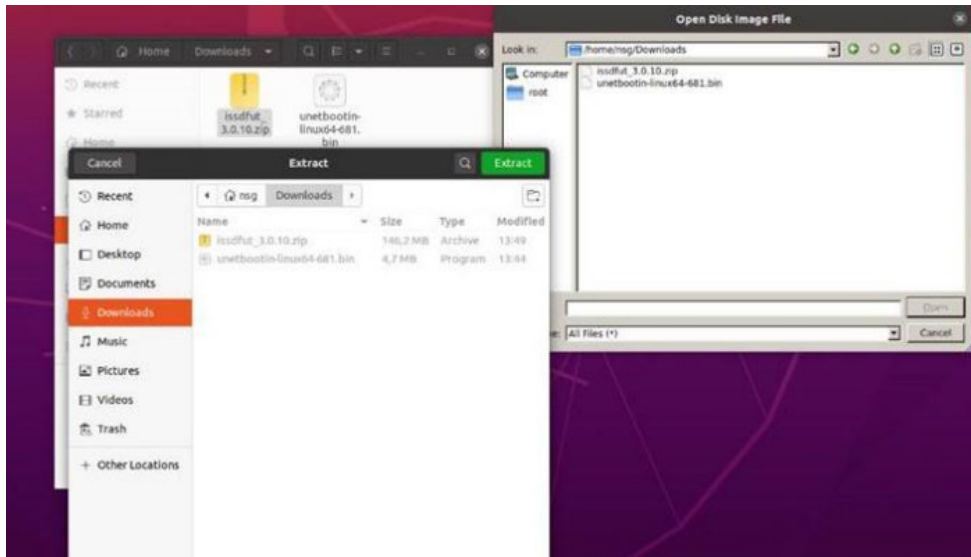
Note: For the purpose of illustration, we are using Unetbootin installer software from unetbootin.github.io, but you may use any installer that you prefer.

1.   Go to the download website located at http://www.intel.com/go/ssdfirmware.

     a.   Review the *Read Me.txt* file to better understand the firmware update process. The *Read Me* file contains high-level instructions for using the Solidigm™ Bootable Firmware Update Tool.

     b.   Review the *Release Notes* document for a quick summary of the firmware changes for each product.

     c.   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 download the firmware update package.
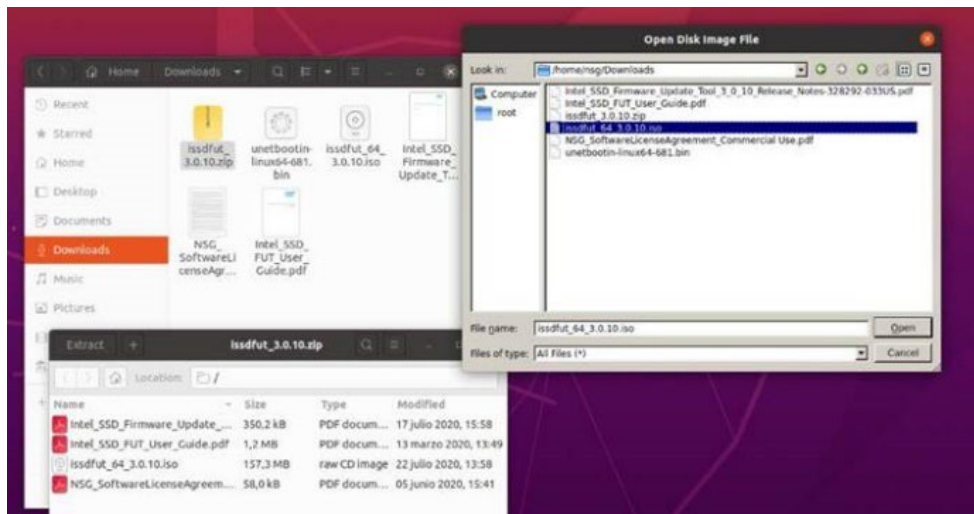
2. Go to https://unetbootin.github.io/ to download the Unetbootin*. This utility will be used to create a bootable USB Flash drive with the Solidgim FUT ISO

3. Install process for Unetbootin:

    a. sudo add-apt-repository ppa:gezakovacs/ppa

    b. sudo apt-get update

    c. sudo apt-get install unetbootin

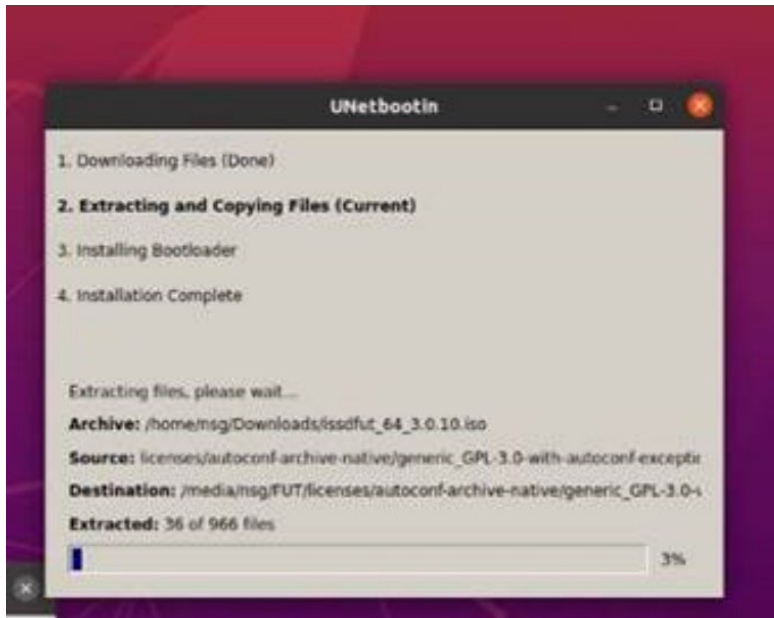4. The packages are located under downloads upon the completion of the installation.

5. Extract the ZIP files to the preferred location.

6. Open the Unetbootin software. Make sure to have a blank USB flash drive attached to a USB port to install the ISO on (see Figure 5)

    a. Select the Disk Image option and upload the Solidgim SSD FUT .ISO Image

    b. Under Type, select USB drive

    c. Under Drive, select the Blank USB drive

    d. Press OK to start burning the image .

7. Restart the system and boot from the USB drive to load the Solidigm™ Bootable Firmware Update Tool.

4.3 Starting the Firmware Update Process

After creating the ISO image USB drive, refer to Section 2.4, "Run the Solidigm™ Bootable Firmware Update Tool" and follow the steps to update the firmware if one is available.

Note: To boot into the connected USB drive, hold down the proper key as defined by your system manufacturer during boot to change the Boot Order.

5 Apple Mac Instructions

5.1 Setting Up

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 SSD to ensure that no data is lost during the firmware update process. Solidigm 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 SSD unusable.

3. **Close Applications**

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

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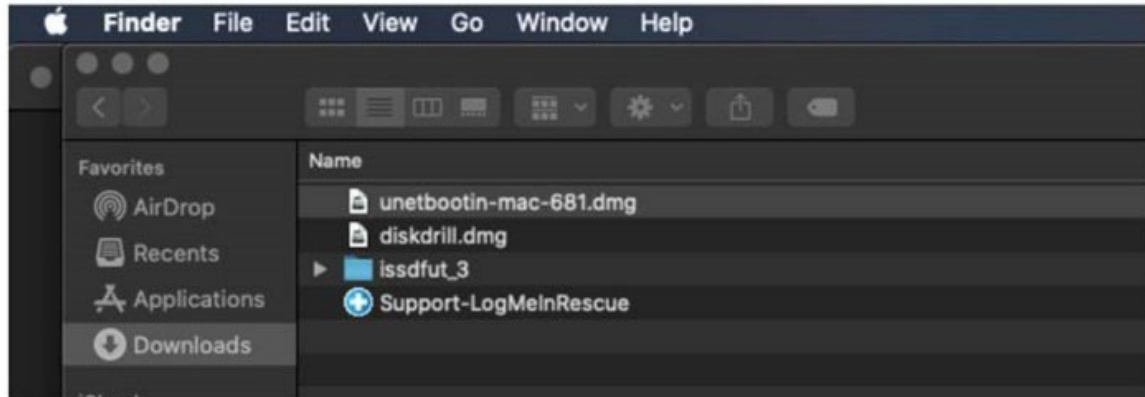
The Solidigm™ Bootable Firmware Update Tool is packaged as an ISO image. Similar to an archive file or a disk image, an ISO image is specifically designed for optical disks like CDs in a format specified by the International Organization for Standardization (ISO).

You cannot simply copy an ISO image to a USB drive. (It will appear as a data file and will not work correctly.) The ISO image must be decoded with software and installed onto a USB drive
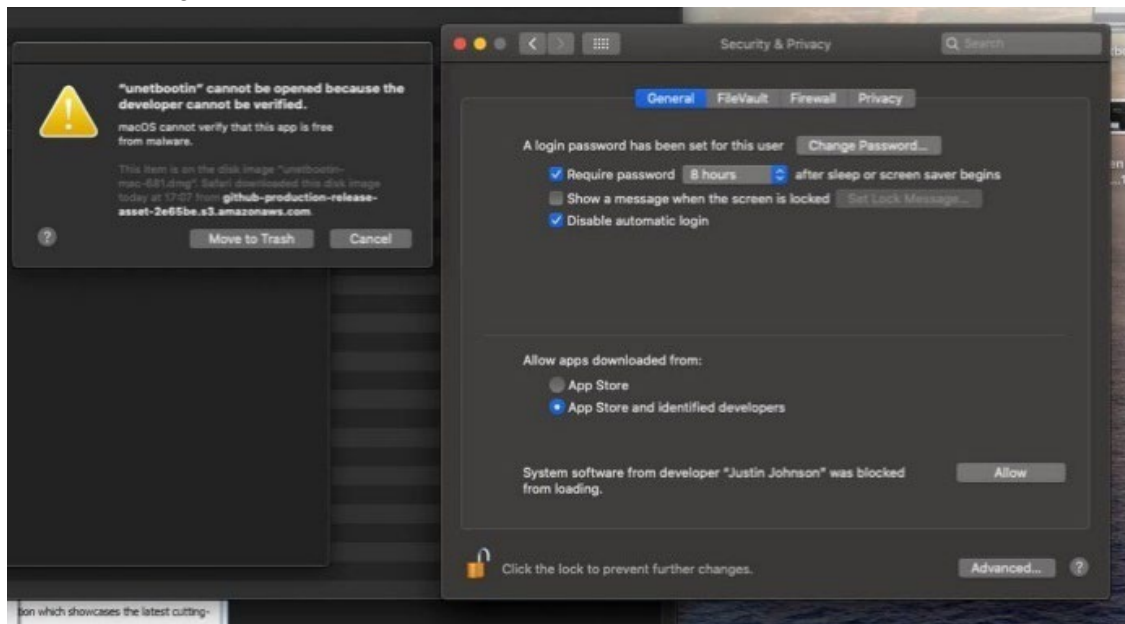
For the purpose of illustration, we are using the Unetbootin USB installer software from unetbootin.github.io, but you may use any installer that you prefer.

1. Go to the Intel download website located at http://www.intel.com/go/ssdfirmware to download the ISO for the Solidigm™ Bootable Firmware Update Tool

   a. Review the *Read Me.txt* file to better understand the firmware update process. The *Read Me* file contains high-level instructions for using the Solidigm™ Bootable Firmware Update Tool.

   b. Review the *Release Notes* document for a quick summary of the firmware changes for each product.

   c. 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 download the firmware package

2. Go to https://unetbootin.github.io/ to download the Unetbootin*. This utility will be used to create a bootable USB Flash drive with the Solidigm Bootable FUT ISO.
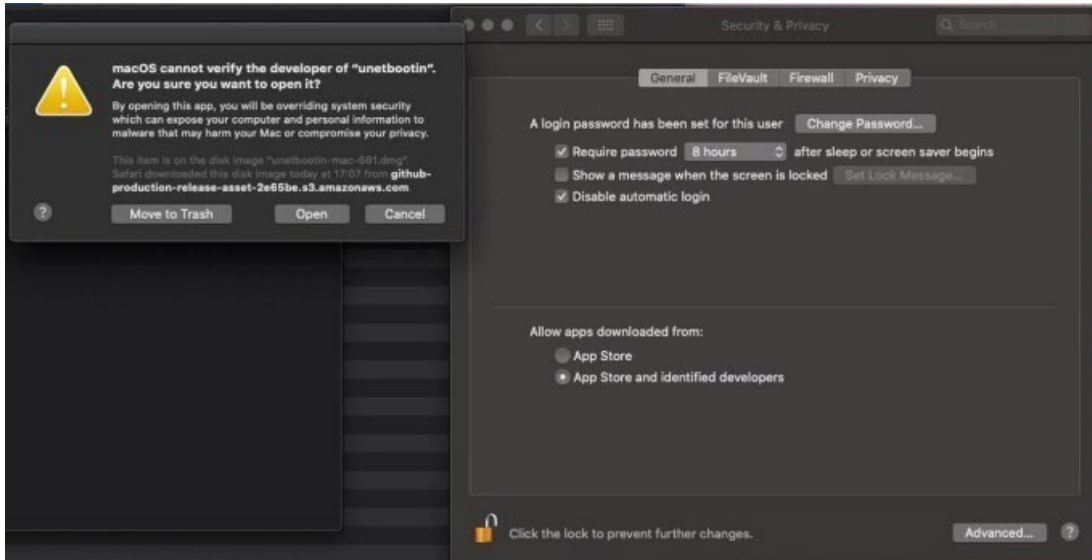
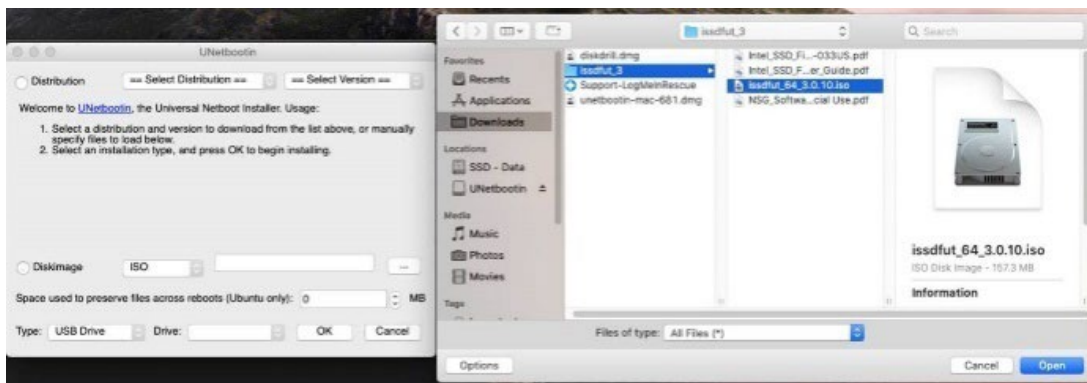3. Install the Unetbootin application from the downloads folder.

4. Permission will need to be granted for the application to run, otherwise the following prompt will appear.
    a. Open the Security & Privacy tab to select (App Store and identified developers), then 'Allow'.

5.   After providing access, restart UNetbootin. The same message as seen in Figure 8 appears, but now there is an additional tab to open the software. Click Open.
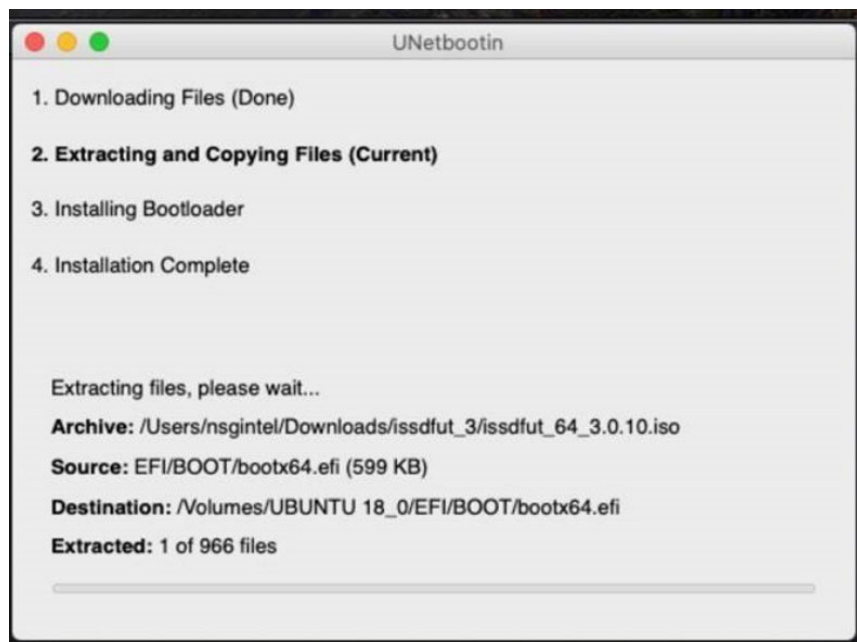

6.   Within the tool, do the following to create the bootable USB drive. Make sure a blank USB drive is currently connected to the system

a.   Select the Disk Image option and upload the Solidigm Bootable FUT .ISO Image previously downloaded.

b. Under Type, select USB Drive.

c. Under Drive, select the Blank USB drive

d. Press OK to start burning the image.

e. Once the process is complete, the system will require to be restarted.

5.3   Starting the Firmware Update Process

After creating the ISO image USB drive, refer to Section 2.4, "Run the Solidigm™ Bootable Firmware Update Tool" and follow the steps to update the firmware if one is available.

Note: To boot into the connected USB drive, hold down the "Option" key to force your system to boot from the USB drive.

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