

BIOS and ME Firmware
Update Guide

Keysight M9537A AXIe High Performance Embedded Controller

Description

This Keysight M9537A BIOS and Management Engine (ME) firmware upgrade guide allows you to restore or update the BIOS and Intel firmware in your M9537A AXIe Embedded Controller. As an example, the procedures stated in this update guide are for BIOS version SL07 and ME firmware version 11.8.55.3510.

As an overview, here are the primary steps to updating the BIOS:

Step 1: Create a bootable USB flash drive

Step 2: Obtain the M9537A BIOS files from www.keysight.com

Step 3: Obtain AFUDOS.exe from www.AMI.com

Step 4: Boot to DOS then run batch files to update the BIOS

Step 5: Verify the update

The remainder of this guide provides detailed instructions for performing these steps.

The instructions use the Microsoft Windows Internet Explorer (IE) browser on a Keysight M9537A Embedded Controller running Windows 10. If you use a different browser or PC, the screens may look different from the pictures below.

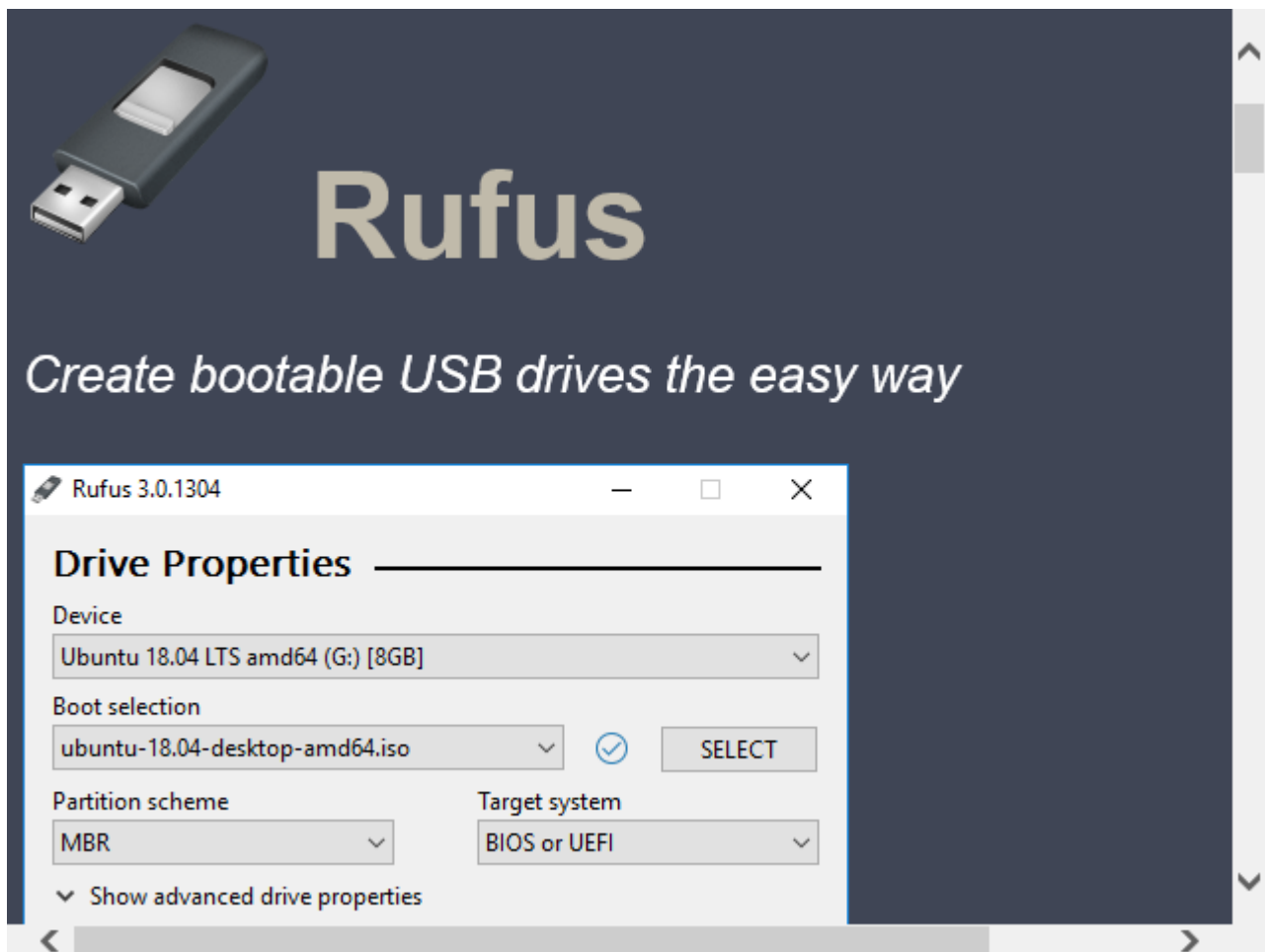
Step 1: Create a Bootable USB Flash Drive

In this step you will create a DOS bootable USB flash drive.

The following procedure is one possible method for creating a bootable USB flash drive. If you already have a bootable USB flash drive, you can skip this step. However, not all bootable USB flash drives provide the correct application environment for the Keysight BIOS update. For example, booting to a Windows 7 System Recovery Disk and going to the command prompt will not work.

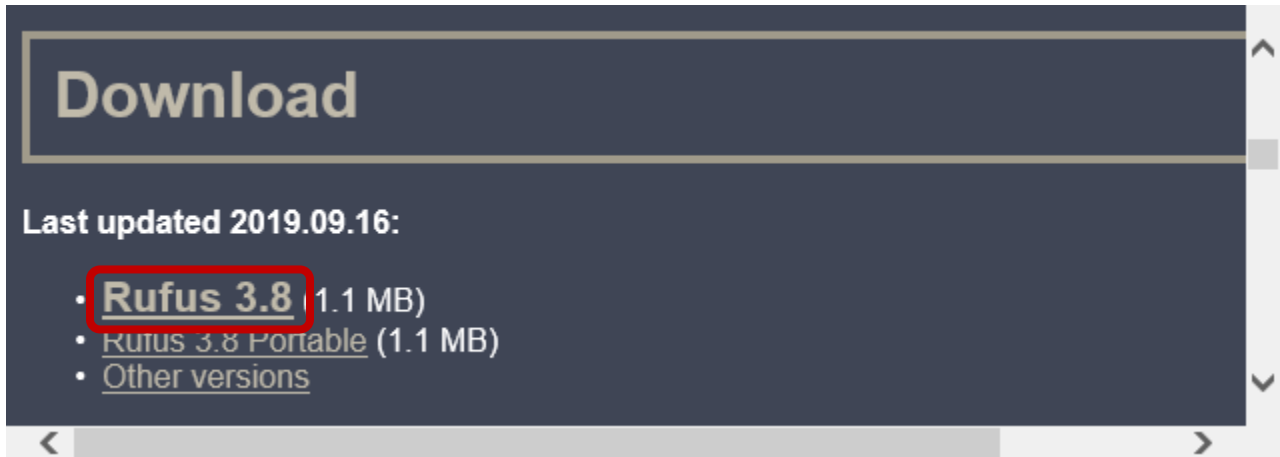
The following instructions use a third-party tool called Rufus. The open source license allows you to use it freely. The Rufus 2.1 default settings create a USB flash drive that boots into a DOS-compatible operating system called FreeDOS¹. This works well with our BIOS update.

- 1 Insert an empty USB flash drive into a USB port on the M9537A. A 128 MB flash drive or larger should be used.
- 2 Run the IE browser and go to this website: <https://rufus.akeo.ie/>. This opens the following window:

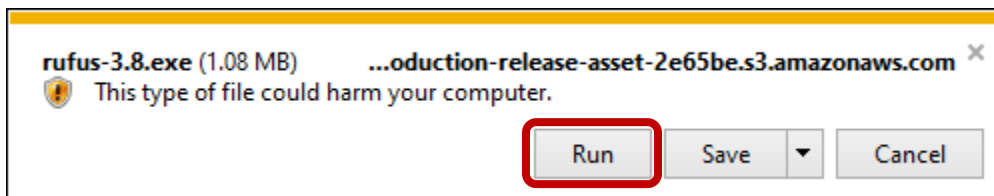


¹ For more information about FreeDOS, see: <http://www.freedos.org>

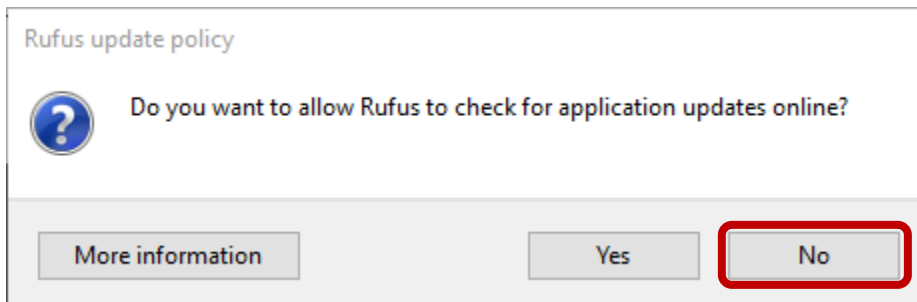
- 3 Scroll down to the “Download” section and click on the “Rufus” link.



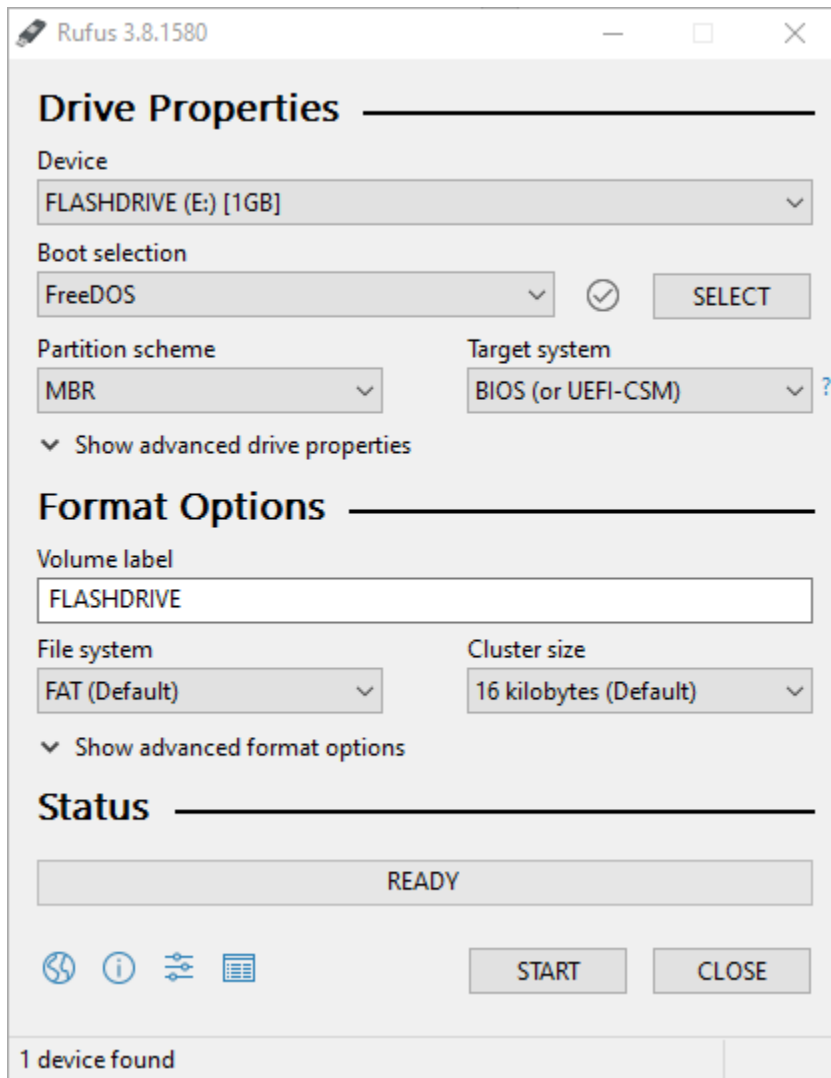
- 4 The IE browser opens the following prompt. Click **Run**.



- 5 The Rufus utility downloads and runs. Click **No** when prompted about the Rufus update policy.

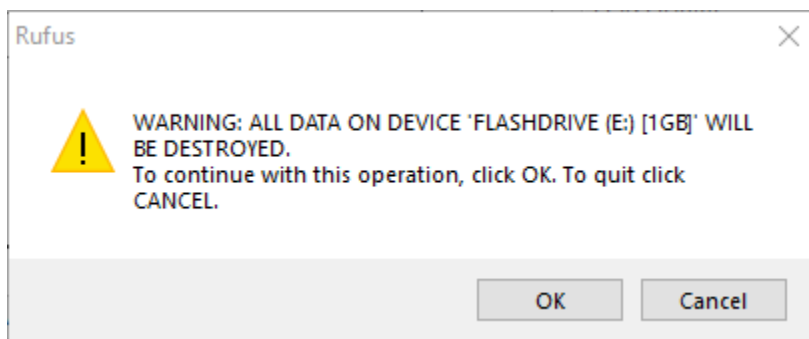


6 Verify that the Device is your flash drive. Set the Boot selection to “FreeDOS”.

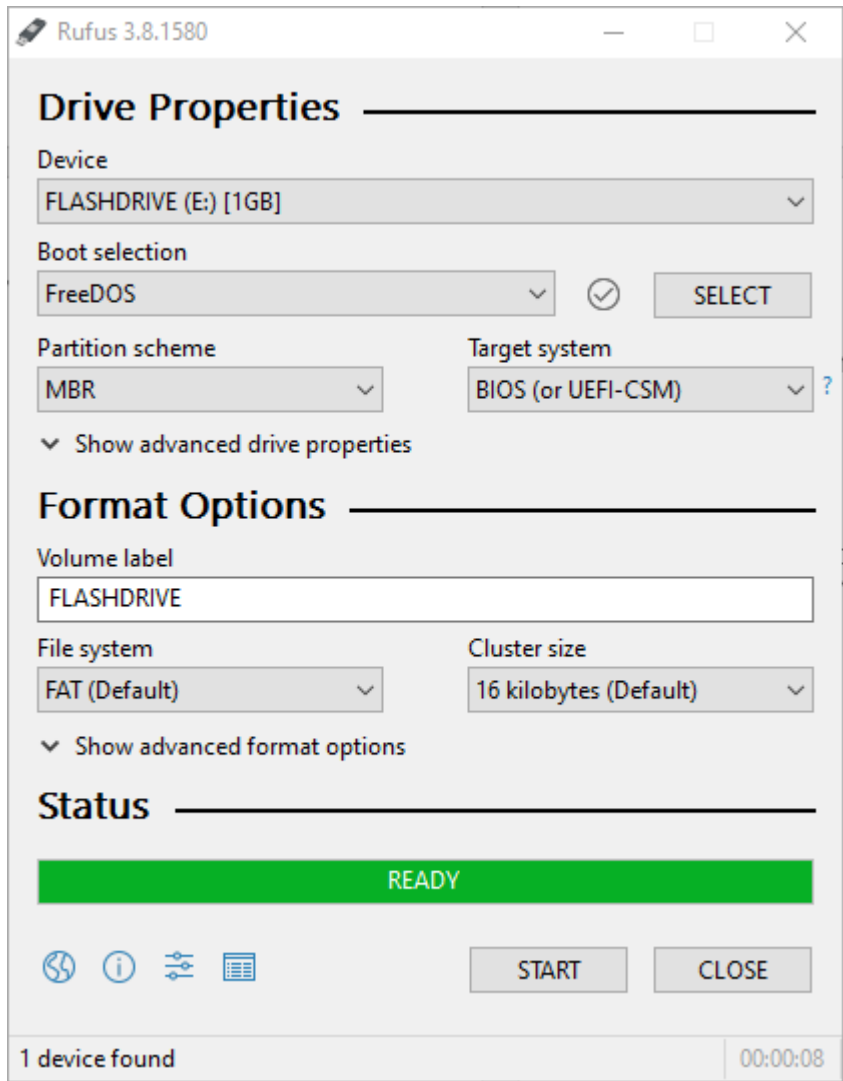


Note: If you have a large flash drive you might need to set the File system to “Large FAT32” in order to make your flash drive bootable.

- 7 Click on **START**.
- 8 When prompted with the following warning, click **OK** to continue.



9 In less than 20 seconds the screen should look like this. Click **CLOSE**.



You have created a bootable USB flash drive that boots into a DOS-compatible operating system called FreeDOS. You are ready for Step 2.

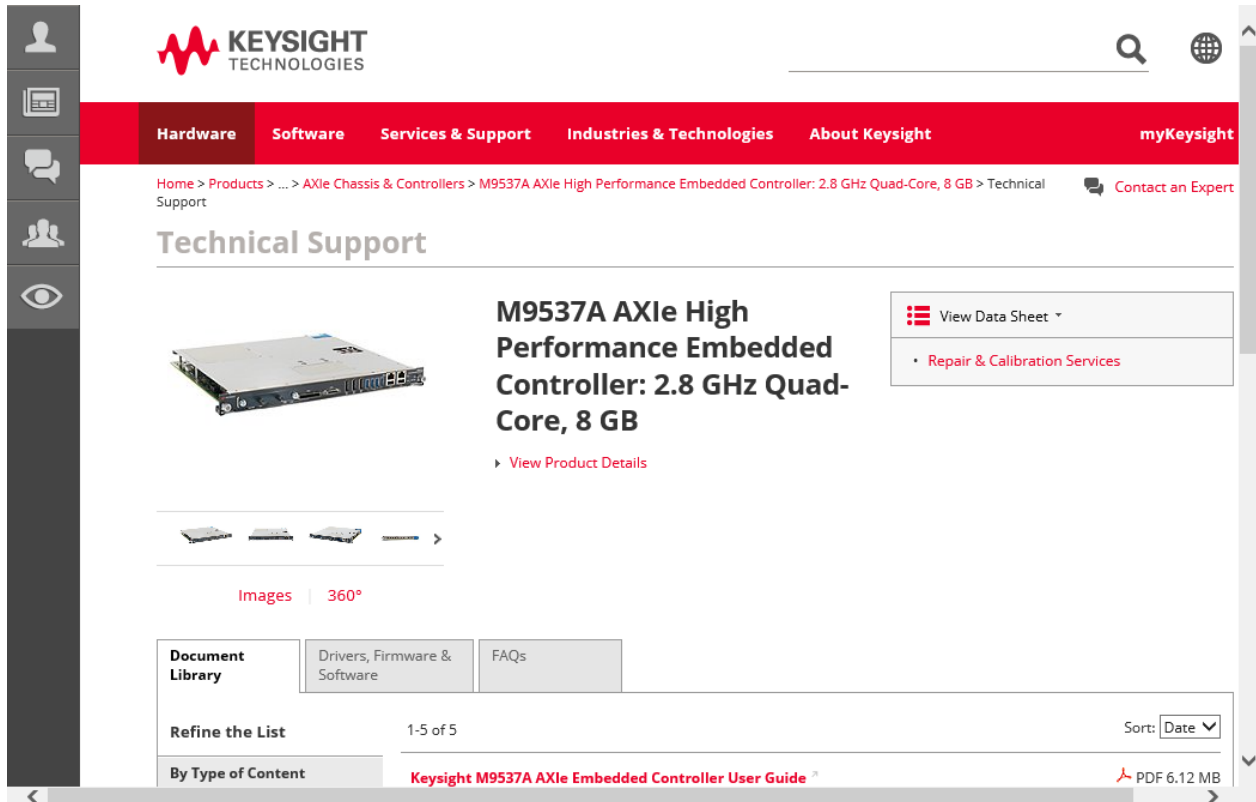
Step 2: Obtain the M9537A BIOS Files from Keysight.com

In this step you will collect files from www.keysight.com and put them on your DOS bootable flash drive.

- 1 In the browser go to www.keysight.com and search for “M9537A”, or use this link: www.keysight.com/find/M9537A

- 2 Then click on:  Visit Technical Support

You will see a page like this:



The screenshot shows the Keysight website's technical support page for the M9537A AXIe High Performance Embedded Controller. The page features a navigation menu with options like Hardware, Software, Services & Support, and Industries & Technologies. A breadcrumb trail indicates the path: Home > Products > ... > AXIe Chassis & Controllers > M9537A AXIe High Performance Embedded Controller: 2.8 GHz Quad-Core, 8 GB > Technical Support. The main content area displays the product name and a 'View Data Sheet' button. Below this, there are tabs for 'Drivers, Firmware & Software' and 'FAQs'. A search filter is set to 'Drivers, Firmware & Software', and the results show one entry: 'Keysight M9537A AXIe Embedded Controller User Guide' (PDF, 6.12 MB).

- 3 Click on the tab labeled **Drivers, Firmware & Software**.
- 4 Click on the BIOS entry:

M9537A BIOS Downloads

New and old BIOS'es for the M9537A...

[Previous Versions](#)

[Computer Software](#)

- 5 Select BIOS version SL07 then download the zip file.



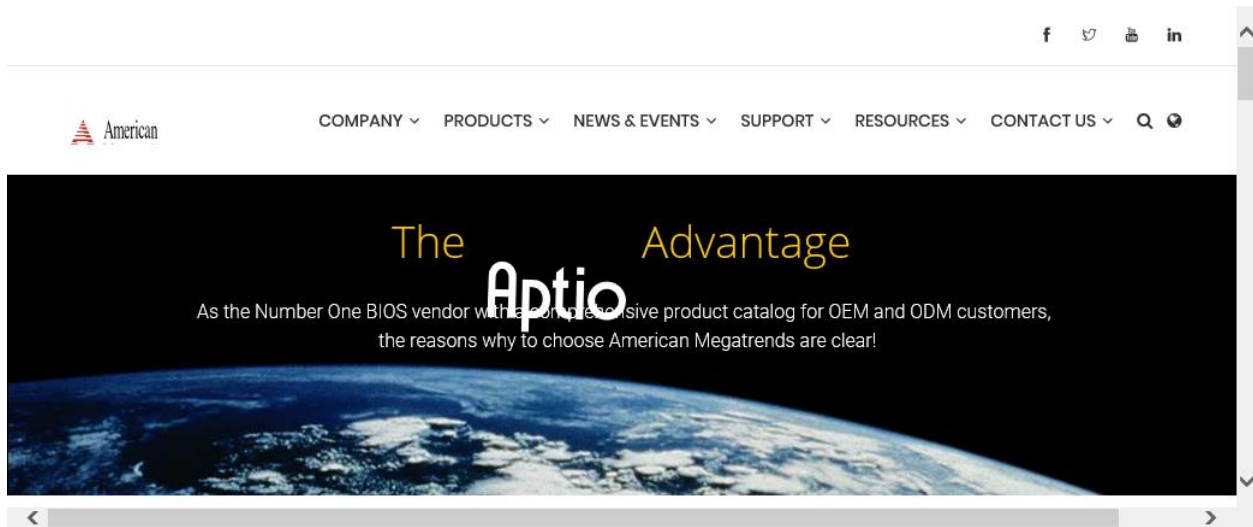
A red button labeled 'Download' is shown next to the text 'Installs on: Instrument'.

- 6 Unzip the file and copy the folder “M9537A_SL07” to the DOS bootable flash drive.

Step 3: Obtain AFUDOS.exe from AMI.com

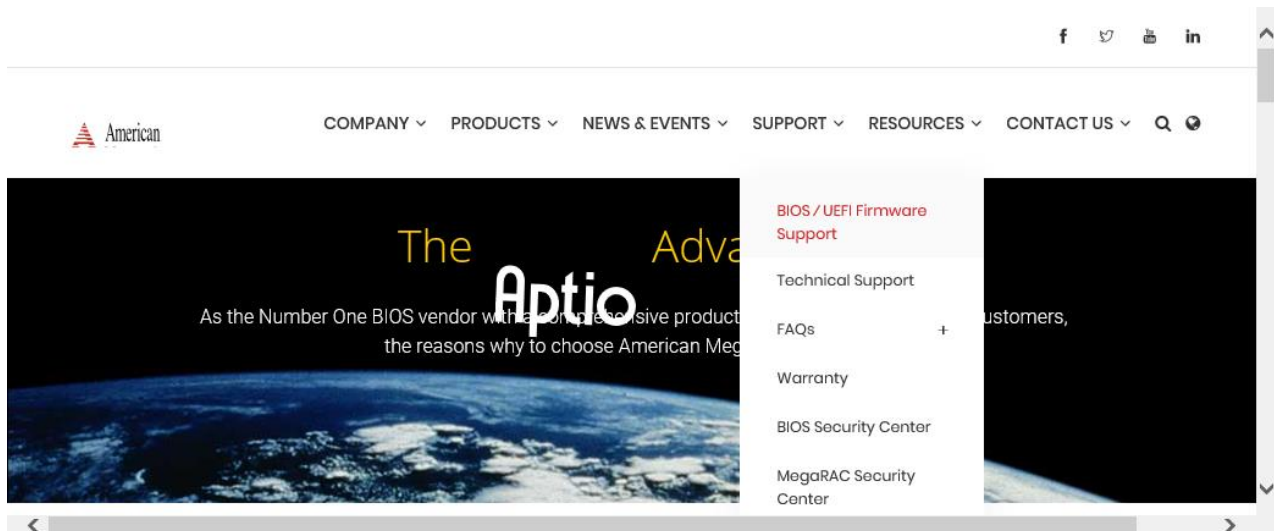
In this step you will collect the file AFUDOS.exe from AMI.com and then copy it on your DOS bootable USB flash drive.

- 1 Open browser to: www.ami.com.
- 2 Left-click the word **SUPPORT** in the top row of the web page.



Note: Your screen may look different than the one shown below.

- 3 A pull-down menu appears. Select "**BIOS/UEFI Firmware Support**".



- Scroll down to near the bottom of the web page to the section *BIOS/UEFI Support Links for End Users*, and under the column Firmware Update Tool with the wrench icon, click on **Firmware Update Tool for Aptio V**.

BIOS/UEFI Support Links for End Users

- Motherboard ID Tool**: To identify the motherboard manufacturer and support path for AMI & non-AMI boards, AMI offers its MBID Tool for download via the link below.
 - DOWNLOAD MBID TOOL
- Status, Checkpoint & Beep Codes**: Status, checkpoint and beep codes offer vital diagnostic information about errors in the pre-boot process, for both UEFI and legacy BIOS platforms.
 - READ ABOUT APTIO 4 STATUS CODES
 - READ ABOUT APTIO V STATUS CODES
- Firmware Update Tool**: The Firmware Update Tool is a utility to update both Aptio and legacy system BIOS. It features both command line and GUI interface for ease of use.
 - FIRMWARE UPDATE TOOL FOR APTIO V
 - FIRMWARE UPDATE TOOL FOR APTIO 4
 - FIRMWARE UPDATE TOOL FOR AMIBIOS 8
- Technical Support**: End Users of AMI products seeking Technical Support are encouraged to use our Technical Support contact form via the link below.
 - CONTACT AMI TECHNICAL SUPPORT

- The License Agreement opens. Scroll down to the bottom and **check** the box and click **Submit** to start the download.

FEEDBACK AND INFORMATION

ANY FEEDBACK YOU PROVIDE AT THIS SITE SHALL BE DEEMED TO BE NON-CONFIDENTIAL. AMI IS FREE TO USE SUCH INFORMATION ON AN UNRESTRICTED BASIS.

I'm not a robot reCAPTCHA Privacy - Terms

Submit

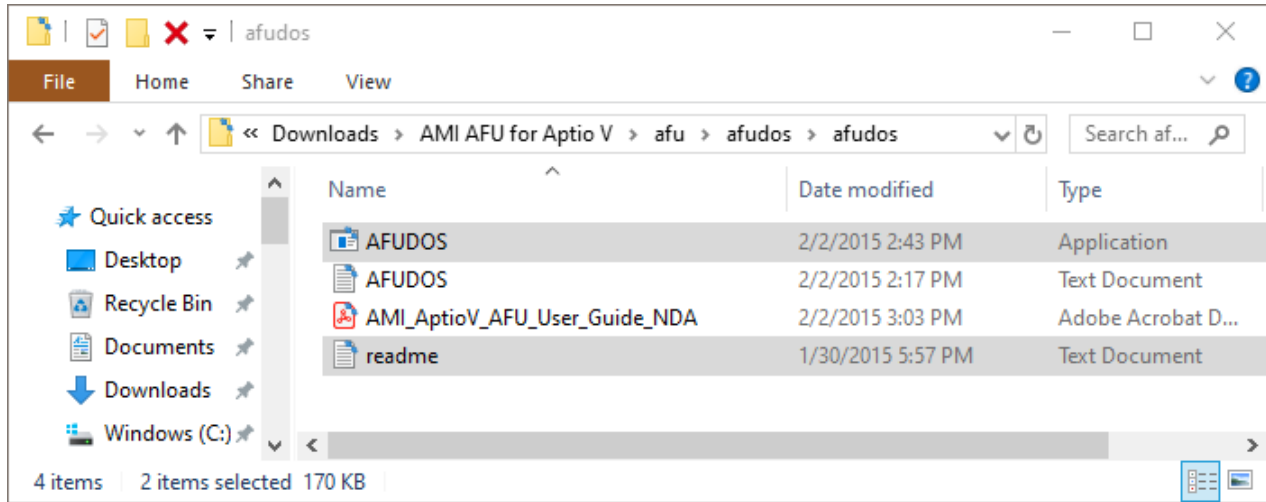
TOP

Save the .zip file.

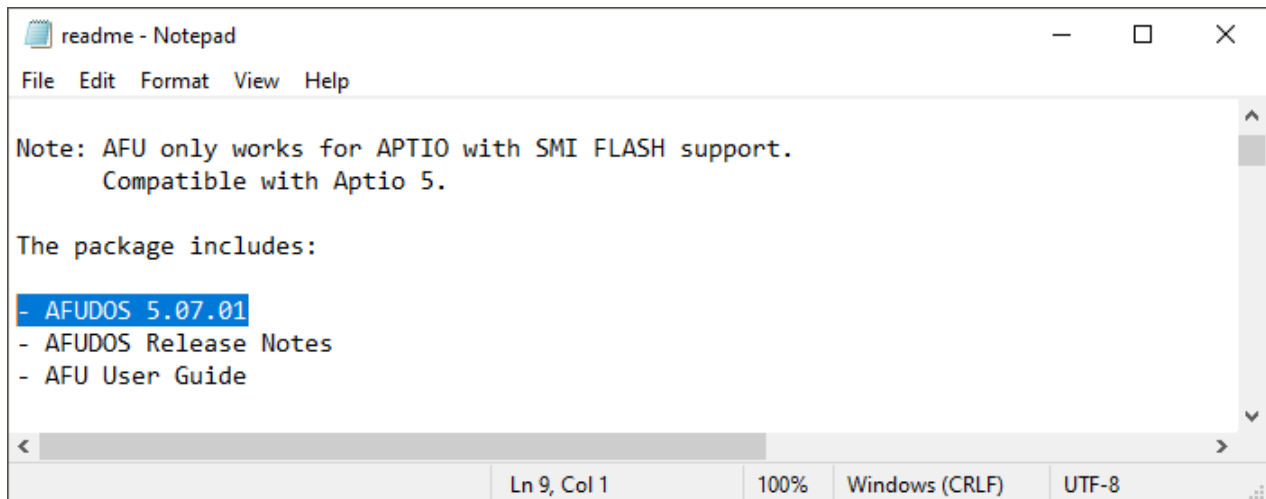
Do you want to open or save **Aptio_V_AMI_Firmware_Update_UTILITY.zip** (16.7 MB) from **ami.com**?

Open Save Cancel

- 6 Unzip the files and then navigate to the “afu” folder, then to the “afudos” folder. Enter the “afudos” folder and find the zip file “AfuDos.zip”. Open it, and enter the “afudos” folder. There you will finally find “AFUDOS.exe” and the “readme.txt” file.



- 7 Open the “readme.txt” file and verify that the version number is 5.07.01. The first few lines of the “readme.txt” file look like this:



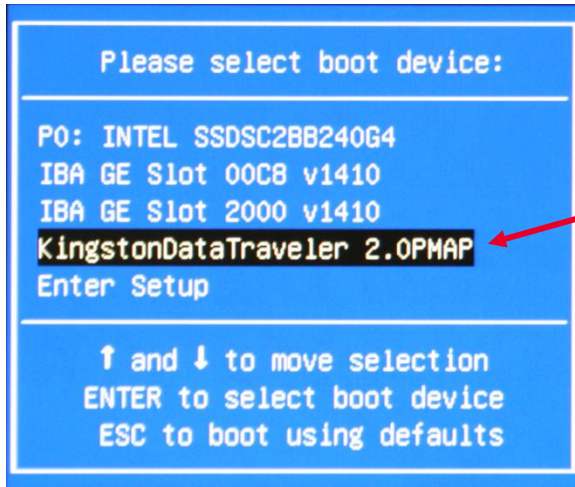
If the version is not 5.07.01, then stop the BIOS install and consult Keysight technical support for advice. Keysight has verified that version 5.07.01 works correctly for installing the BIOS.

- 8 Copy “AFUDOS.exe” to your flash drive into the folder “M9537A_<version>/BIOS1_ME/”. For example, if your flash drive is drive D:, then copy AFUDOS.exe to “D:/M9537A_SL07/BIOS1_ME/”.

Step 4: Boot to DOS then Run the Batch Files to Update the BIOS

In this step you will update your M9537A to the new BIOS and/or Intel ME firmware version.

- 1 With the USB flash drive plugged into the M9537A, reboot and press F7 during the boot up splash screen. Scroll down to your flash drive and press **Enter**.



Your flash drive may appear different.

If the flash drive does not appear in this list, put it in another type of USB port (e.g. USB 2.0 or USB 3.0) and reboot. If it still does not appear, try a different manufacturer flash drive or flash drive with a smaller size.

Within three seconds you will be booted to FreeDOS and have a command prompt.

- 2 First, change to the folder M9537A_SL07/BIOS1_ME/

Type: cd M9537A~1<enter>

Type: cd BIOS1_ME<enter>

```
kernel compatibility 7.10 - MATCOMC - FAT32 support
(C) Copyright 1995-2012 Pasquale J. Villani and The FreeDOS Project.
All Rights Reserved. This is free software and comes with ABSOLUTELY NO
WARRANTY; you can redistribute it and/or modify it under the terms of the
GNU General Public License as published by the Free Software Foundation;
either version 2, or (at your option) any later version.
C: HD1, Prt# 11, CHS= 0-32-33, start= 1 MB, size= 29951 MB

FreeCom version 0.04-pre2 XMS_Swap [Aug 20 2006 00:29:00]
Using US-English keyboard with US-English codepage [437]
C:\>cd m9537a\1\
C:\M9537A\1>dir
Volume in drive C is DOS_USB
Volume Serial Number is 1800-2589
Directory of C:\M9537A\1

.                <DIR> 05-14-20 11:01a
..               <DIR> 05-14-20 11:01a
HISTORY.TXT     6,762 01-08-20  8:28a
BIOS1_ME        <DIR> 05-11-20  9:35p
BIOS2_ME        <DIR> 05-11-20  9:35p
                1 file(s)        6,762 bytes
                4 dir(s)      29,878 Mega bytes free
C:\M9537A\1>cd BIOS1_ME\
```

- Please run the following batch commands one after the other. Do not start the next command until the first command finishes. Each batch command starts with a digit. The digits are the order of execution, from 1 through 7. Because the DOS command line provides auto-completion on a tab, it is very easy to run the commands one after the other, by typing “1<tab><enter>”, “2<tab><enter>”, and so forth.

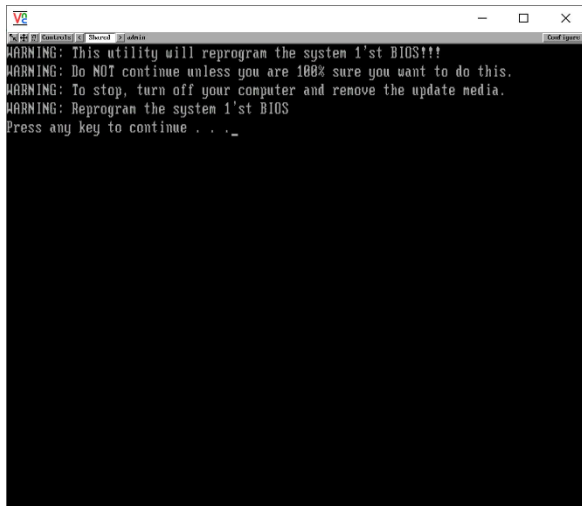
NOTE

Batch commands 1 through 3 are used to update the BIOS. Batch commands 4 through 7 are used to update the Intel Management Engine firmware.

The commands that you will execute are:

```
1UNLOCK.BAT
2PBIOS1.BAT
3LOCK.BAT
4MEMANUF.BAT
5CLOSE~1.BAT
6EOL.BAT
7FWCHECK.BAT
```

- Execute the **1UNLOCK.BAT** command. The M9537A will then reboot after the command is entered.
- Execute the **2PBIOS1.BAT** command. The system will display a few warnings:



Press any key to continue. The system will begin updating the primary BIOS.

CAUTION

Do not interrupt this process. There is no option for recovery if the BIOS update process is terminated prematurely. Your M9537A will most likely lock-up and will not boot. To get your M9537A working again you must send it to Keysight for repair.

6 Execute the **3LOCK.BAT** command. The M9537A will reboot twice after the command is entered.

```

Directory of C:\M9537A\1\BIOS1_ME
.                <DIR> 05-14-20 11:31a
.                <DIR> 05-14-20 11:31a
3LOCK.BAT       91 06-21-16 11:21a
4MEMANUF.BAT   37 06-16-16 0:52a
5CLOSE~1.BAT   46 06-15-16 2:30p
6EOL.BAT       42 06-16-16 0:53a
7FWCHECK.BAT   47 06-16-16 0:53a
AFUDOS.EXE     168,912 05-25-15 12:02p
DOS_RTC.EXE    30,458 12-31-00 12:01p
FPARTS.TXT     11,091 03-03-16 1:40p
FPT.EXE        1,684,942 06-20-10 9:29a
FWCHECK.EXE    24,694 10-27-15 4:32a
MEMANUF.EXE    1,723,604 06-20-10 9:20a
MMSMB.EXE      10,924 06-23-15 6:16a
SL07.BIN       16,777,216 01-00-20 6:50a
SL07.ROM       0,300,600 01-00-20 6:50a
USCCOMM.BIN    3,455 06-23-10 11:20a
17 file(s)      20,024,691 bytes
2 dir(s)        29,870 Mega bytes free
C:\M9537A\1\BIOS1_ME>3LOCK.BAT

```

7 Execute the **4MEMANUF.BAT** command. The system will begin updating the Intel Management Engine firmware.

The system will display a “MEManuf Operation Passed” if the operation is successful:

```

6EOL.BAT       42 06-16-16 0:53a
7FWCHECK.BAT   47 06-16-16 0:53a
AFUDOS.EXE     168,912 05-25-15 12:02p
DOS_RTC.EXE    30,458 12-31-00 12:01p
FPARTS.TXT     11,091 03-03-16 1:40p
FPT.EXE        1,684,942 06-20-10 9:29a
FWCHECK.EXE    24,694 10-27-15 4:32a
MEMANUF.EXE    1,723,604 06-20-10 9:20a
MMSMB.EXE      10,924 06-23-15 6:16a
SL07.BIN       16,777,216 01-00-20 6:50a
SL07.ROM       0,300,600 01-00-20 6:50a
USCCOMM.BIN    3,455 06-23-10 11:20a
17 file(s)      20,024,691 bytes
2 dir(s)        29,870 Mega bytes free
C:\M9537A\1\BIOS1_ME>4MEMANUF.BAT
C:\M9537A\1\BIOS1_ME>ren For M9537A Project Use
C:\M9537A\1\BIOS1_ME>MEManuf

Intel(R) MEManuf Version: 11.0.55.3510
Copyright(C) 2005 - 2010, Intel Corporation. All rights reserved.

MEManuf Operation Passed
C:\M9537A\1\BIOS1_ME>

```

8 Execute the **5CLOSE~1.BAT** command. The M9537A will then reboot after the command is entered.

9 Execute the **6EOL.BAT**, followed by the **7FWCHECK.BAT** command.

The system will display a “FW works well” after verifying the ME firmware version:

```

3LOCK.BAT       91 06-21-16 11:21a
4MEMANUF.BAT   37 06-16-16 0:52a
5CLOSE~1.BAT   46 06-15-16 2:30p
6EOL.BAT       42 06-16-16 0:53a
7FWCHECK.BAT   47 06-16-16 0:53a
AFUDOS.EXE     168,912 05-25-15 12:02p
DOS_RTC.EXE    30,458 12-31-00 12:01p
FPARTS.TXT     11,091 03-03-16 1:40p
FPT.EXE        1,684,942 06-20-10 9:29a
FWCHECK.EXE    24,694 10-27-15 4:32a
MEMANUF.EXE    1,723,604 06-20-10 9:20a
MMSMB.EXE      10,924 06-23-15 6:16a
SL07.BIN       16,777,216 01-00-20 6:50a
SL07.ROM       0,300,600 01-00-20 6:50a
USCCOMM.BIN    3,455 06-23-10 11:20a
17 file(s)      20,024,691 bytes
2 dir(s)        29,870 Mega bytes free
C:\M9537A\1\BIOS1_ME>7FWCHECK.BAT
C:\M9537A\1\BIOS1_ME>ren For M9537A Project Use
C:\M9537A\1\BIOS1_ME>FuCheck 0x50 0x51
ADLINK Firmware Health Reporter [Version 1.02]

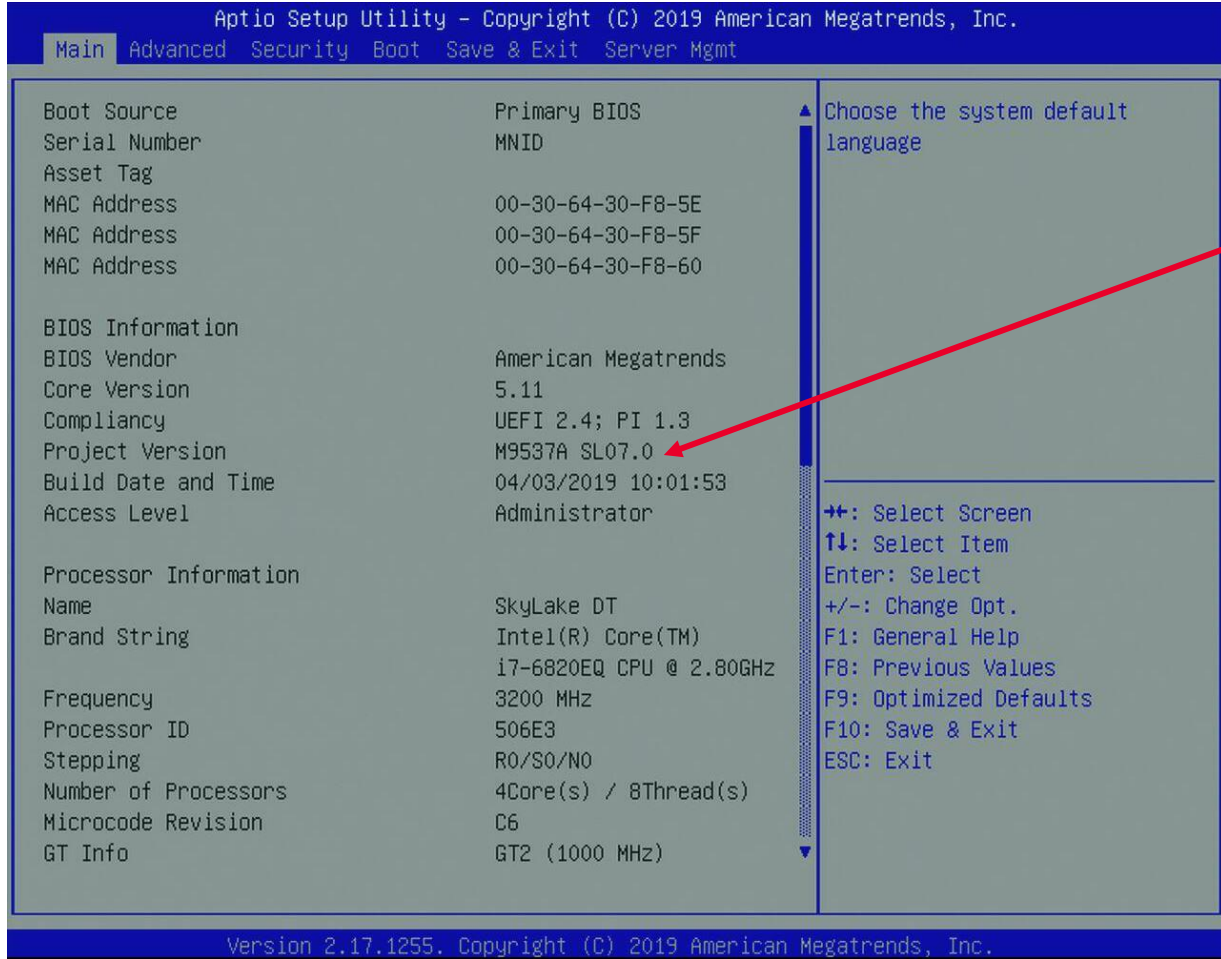
FW works well.
C:\M9537A\1\BIOS1_ME>
C:\M9537A\1\BIOS1_ME>

```

Step 5: Verify the Update

In this step you will verify that the installed version of BIOS and ME FW are what you intended.

- 1 Reboot the M9537A.
- 2 On the boot-up Keysight splash screen press the **DEL** key to display the BIOS screen.
- 3 On the Main BIOS screen the BIOS version is displayed. Verify that it is the version you want.

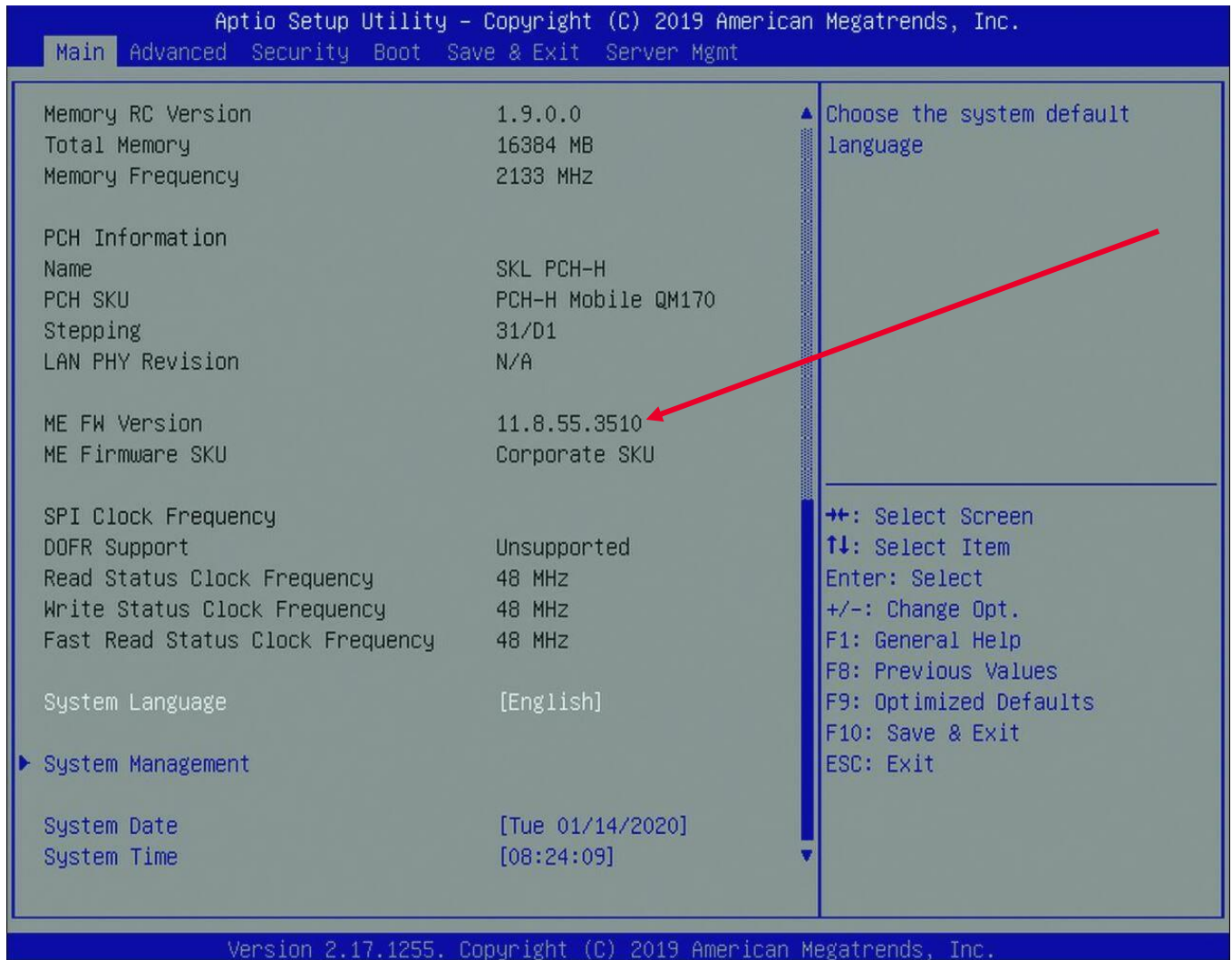


You can also verify the BIOS version number by booting to Windows and running the command “msinfo32.exe”. The first screen that opens, shows the BIOS version number.

The screenshot shows the Windows System Information application. The left sidebar has a tree view with 'System Summary' selected. The main area displays a list of system items and their values. The 'BIOS Version/Date' entry is highlighted with a red box, showing the value 'American Megatrends Inc. SL07.0, 1/9/2020'. At the bottom, there is a search bar and two checkboxes: 'Search selected category only' and 'Search category names only'.

Item	Value
OS Name	Microsoft Windows 10 Enterprise LTSC
Version	10.0.17763 Build 17763
Other OS Description	Not Available
OS Manufacturer	Microsoft Corporation
System Name	KEYSIGH-RMIJF85
System Manufacturer	Keysight Technologies
System Model	M9537A
System Type	x64-based PC
System SKU	M9537A
Processor	Intel(R) Core(TM) i7-6820EQ CPU @ 2.80GHz, 2808 Mhz, 4 Core(s)
BIOS Version/Date	American Megatrends Inc. SL07.0, 1/9/2020
SMBIOS Version	3.0
Embedded Controller Version	255.255
BIOS Mode	Legacy
BaseBoard Manufacturer	ADLINK
BaseBoard Product	65506
BaseBoard Version	
Platform Role	Mobile
Secure Boot State	Unsupported
PCR7 Configuration	Binding Not Possible
Windows Directory	C:\WINDOWS
System Directory	C:\WINDOWS\system32

- 4 On the BIOS screen hit the “Page Down” key to scroll to the bottom of the page. This will allow you to look at the ME firmware version.



- 5 You have completed updating the BIOS and ME FW on your M9537A.