



# AMI Aptio AFU User Guide

## Aptio AFU User Guide

**Document Revision 0.25**

**JANUARY 13, 2011**



Confidential, NDA Required  
Copyright ©2011

American Megatrends, Inc.  
5555 Oakbrook Parkway  
Suite 200  
Norcross, GA 30093 (USA)

All Rights Reserved  
Property of American Megatrends, Inc.

# Legal

## Disclaimer

This publication contains proprietary information which is protected by copyright. No part of this publication may be reproduced, transcribed, stored in a retrieval system, translated into any language or computer language, or transmitted in any form whatsoever without the prior written consent of the publisher, American Megatrends, Inc. American Megatrends, Inc. retains the right to update, change, modify this publication at any time, without notice.

## For Additional Information

Call American Megatrends, Inc. at 1-800-828-9264 for additional information.

## Limitations of Liability

In no event shall American Megatrends be held liable for any loss, expenses, or damages of any kind whatsoever, whether direct, indirect, incidental, or consequential, arising from the design or use of this product or the support materials provided with the product.

## Limited Warranty

No warranties are made, either expressed or implied, with regard to the contents of this work, its merchantability, or fitness for a particular use. American Megatrends assumes no responsibility for errors and omissions or for the uses made of the material contained herein or reader decisions based on such use.

## Trademark and Copyright Acknowledgments

Copyright ©2011 American Megatrends, Inc. All Rights Reserved.

American Megatrends, Inc.  
5555 Oakbrook Parkway  
Suite 200  
Norcross, GA 30093 (USA)

All product names used in this publication are for identification purposes only and are trademarks of their respective companies.

# Table of Contents

<b>Aptio AFU User Guide .....</b>	<b>1</b>
Document Revision 0.25 .....	1
January 13, 2011 .....	1
<b>Legal.....</b>	<b>2</b>
<b>Table of Contents .....</b>	<b>3</b>
<b>Document Information .....</b>	<b>4</b>
Purpose .....	4
Audience .....	4
Change History .....	4
Review History .....	4
<b>Chapter 1   Introduction.....</b>	<b>5</b>
Overview.....	5
AFUAPTIO Features .....	5
Requirements .....	5
<i>Supported Operating System.....</i>	<i>5</i>
<i>Firmware Requirements.....</i>	<i>6</i>
<b>Chapter 2   Getting Started .....</b>	<b>7</b>
Installation .....	7
<b>Chapter 3   AFUAPTIO Operation .....</b>	<b>8</b>
Overview.....	8
<b>Chapter 4   Features and Functions.....</b>	<b>9</b>
Overview.....	9
Save current ROM image to file .....	9
Get and display ROM ID from BIOS ROM file .....	9
Options.....	10
<i>Rules: .....</i>	<i>11</i>
Error Code Definition .....	12

## Document Information

### Purpose

This document provides information to use the Aptio AFU to update the system BIOS.

### Audience

Generic BIOS Engineers, OEM Engineers, and Aptio Customers.

### Change History

Date	Revision	Description
2007-03-30	0.10	Initial draft
2007-08-23	0.11	Updated document format
2007-09-12	0.12	Added product version number to page 1
2007-09-18	0.13	Updated for version 2.19 release
2009-07-09	0.14	Updated version, Legal, and Title page.
2009-08-13	0.15	1. Update Title and content to latest release of AFU. 2. Update usage to latest release of AFU.
2009-10-08	0.16	Correct spelling errors.
2009-10-14	0.17	Correct document properties and title.
2010-02-11	0.18	Add caution comment for option /N.
2010-02-22	0.19	Add more comments for option /N and /SP.
2010-07-02	0.20	Add the comment for option /R.
2010-08-10	0.21	Update content to latest release of AFU
2010-08-26	0.22	Correct document properties and title.
2010-09-14	0.23	Add error code definition.
2010-11-25	0.24	Add Windows PE in support list.
2011-01-13	0.25	Update content to latest release of AFU

### Review History

Date	Comments	Approval

## Chapter 1 Introduction

### Overview

AFU (AMI Firmware Update) is a package of utilities used to update the system BIOS under various operating systems. AFU only works for APTIO with SMI FLASH support.

### AFUAPTIO Features

This list of features is supported from command line, command prompt, EFI Shell, or BSD/Linux shell.

- Read system ROM image
- Flash ROM image
- Command line operating

### Requirements

#### Supported Operating System

AFU is supported by the following operating systems:

- Microsoft® Windows® 2000
- Microsoft® Windows® XP
- Microsoft® Windows® 2003
- Microsoft® Windows® Vista (32 bit)
- Microsoft® Windows® Vista (64 bit)
- Microsoft® Windows® 7 (32 bit)
- Microsoft® Windows® 7 (64 bit)
- Microsoft® Windows® PE (32 bit)
- Microsoft® Windows® PE (64 bit).
- EFI Shell
- DOS
- BSD
- Linux

## Firmware Requirements

- Compatible with Aptio 3, 4, and 4.5 and later.
- Requires that the current installed firmware has SMI flashing support enabled.

## Chapter 2 Getting Started

### Installation

To run, extract all of the files from the folder with the name corresponding to the desired operating system.

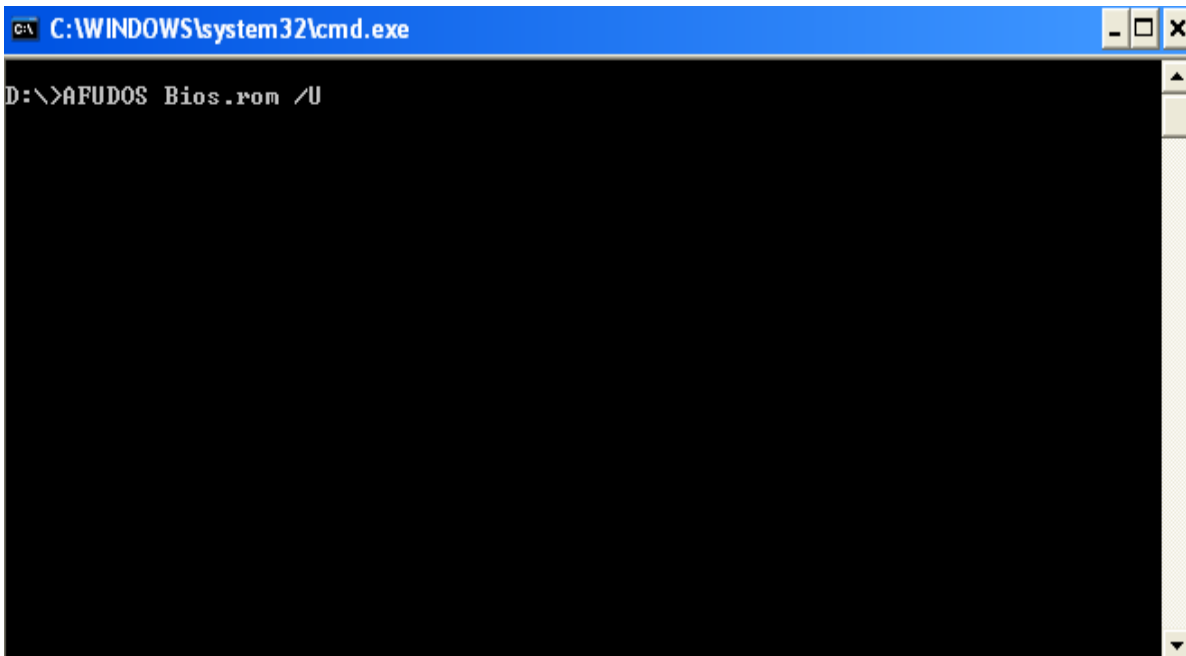
## Chapter 3 AFUAPTIO Operation

### Overview

This mostly involves documenting all the SDL tokens and eLinks. This chapter explains the operation of AFUAPTIO.

The AFUAPTIO operation mode includes all of the AFUAPTIO features such as saving current ROM image to file, Get and display ROM ID from BIOS ROM file

An example of AFUDOS that Get and display ROM ID from BIOS ROM file command screen is shown below:



```
C:\WINDOWS\system32\cmd.exe
D:\>AFUDOS Bios.rom /U
```



## Chapter 4 Features and Functions

### Overview

The AFUAPTIO offers the following features:

- Save current ROM image to file
- Get and display ROM ID from BIOS ROM file

These features are explained in more detail in this chapter.

### Save current ROM image to file

The following command saves the current ROM image to a file:

**AFUDOS <Output BIOS ROM File Name> /O**

Where BIOS ROM File Name, the mandatory field is used to specify path/filename of the BIOS ROM file with extension.

### Get and display ROM ID from BIOS ROM file

The following command gets and displays the ROM ID from the BIOS ROM file:

**AFUDOS <Output BIOS ROM File Name> /U**

Where BIOS ROM File Name, the mandatory field is used to specify path/filename of the BIOS ROM file with extension.

## Options

**AFUDOS <BIOS ROM File Name> [Option 1] [Option 2]**

**Or**

**AFUDOS <BIOS ROM File Name> <Command>**

### BIOS ROM File Name

The mandatory field is used to specify path/filename of the BIOS ROM file with extension.

### Commands

The mandatory field is used to select an operation mode.

- /O     Save current ROM image to file
- /U     Get and display ROM ID from BIOS ROM file
- /S     Refer to Option: /S
- /D     Verification test of given ROM File without flashing BIOS.

### Options

The optional field used to supply more information for flashing BIOS ROM. Following lists the supported optional parameters and format:

- /P             Program main bios image
- /B             Program Boot Block
- /N             Program NVRAM block (\*1)
- /E             Program Embedded Controller block if present
- /K             Program all NCBs or ROM Holes
- /Kn            Program nth (zero based) NCB or ROM Hole (n range is 0 to 7)
- /Q             Quiet mode enable
- /REBOOT       Reboot after update BIOS done
- /X             Do not check ROM ID
- /S             Display current system's BIOS ROM ID
- /R             Preserve all SMBIOS structures during NVRAM programming (\*2)
- /Rn            Preserve SMBIOS type N during Boot Block programming.

- /Shutdown      Shutdown system after programming.
- /HOLE: GUID    Update a specific ROM Hole by given ROM Hole GUID.
- /HOLEOUT: GUID Save specific ROM Hole data to file by given ROM Hole GUID.
- /SP              Preserve specific data stored in NVRAM (\*3)
- /ME              Program ME entire firmware block. (Only supported in DOS and Win PE)
- /MEUF           Program ME ignition firmware block.
- /EC              Program Embedded Controller Block.
- /ECUF           Update EC BIOS when newer version is detected
- /CAF             Compare ROM file's data with Systems is different or not, if not then cancel related update.
- /A                OEM Activation file

\* 1: Erasing NVRAM may cause important variables lose.

\* 2: If the SMBIOS data is stored in FV\_MAIN or FV\_BB, that AFU will take the responsible to preserve its data. If the SMBIOS data is stored in NVRAM and BIOS project's SMBIOS\_PRESERVE\_NVRAM token = 0. This mean the preserve action is needs BIOS' cooperation. To know more about the detail of preserved data, please consult with your BIOS provider.

\* 3: This function needs BIOS' cooperation. To know more about the detail of preserved data, please consult with your BIOS provider.

#### Rules:

- Any parameter enclosed by < > is a mandatory field.
- Any parameter enclosed by [ ] is an optional field.
- <Commands> cannot co-exist with any [Options].
- Main BIOS image is default flashing area if no any option present.
- [/REBOOT], [/X], and [/S] will enable [/P] function automatically.
- If [/B] present alone, there is only the Boot Block area to be updated.
- If [/N] present alone, there is only the NVRAM area to be updated.
- If [/E] present alone, there is only the Embedded Controller block to be updated.

## Error Code Definition

CODE	Definition
0x01	Invalid command line arguments
0x02	BIOS not supporting AFU utilities
0x03	BIOS ROM file with wrong size
0x04	BIOS ROM tag different in file and ROM
0x05	BOOT BLOCK checksum error
0x06	Unsupported Non-critical block
0x07	BIOS modules checksum error
0x08	Invalid user options in BIOS flashing
0x09	Size of ROM file does not match the size of system ROM
0x0A	Unable to update ROM hole
0x0B	ROMHOLE not exist
0x0C	BIOS update cancelled by user.
0x10	Error loading flash device driver
0x11	Error unloading flash device driver
0x12	Invalid Non Critical Block request by user
0x13	Requested non-critical block not available in ROM file
0x14	Non-critical blocks in ROM image file do not match those in the system
0x20	Error initializing memory manager
0x21	Error closing memory manager
0x22	Error allocating memory
0x23	Error releasing memory
0x24	Error allocating memory for BIOS interface
0x25	Error releasing memory for BIOS interface
0x26	Error mapping BIOS code
0x27	Error unmapping BIOS code
0x28	Error mapping BIOS data
0x29	Error unmapping BIOS data
0x30	Error opening input file
0x31	Error reading input file
0x32	Error opening output file
0x33	Error writing output file
0x40	Error opening BIOS flashing interface
0x41	Error closing BIOS flashing interface
0x42	Error reading BIOS flash
0x43	Error erasing BIOS flash
0x44	Error writing BIOS flash
0x45	Error verifying BIOS flash
0x46	Error in getting flash information
0x47	Error in getting flash information
0x48	Error power cord not plugged in
0x49	Firmware has prevented flashing

0x50	DOS executable cannot run under Windows
<b>CODE</b>	<b>Definition</b>
0x60	Error accessing Windows registry
0x70	Error accessing IO driver in BSD
0x80	Error: Size of system ROM mismatches size of ROM file
0x81	Error: ROM ID mismatch
0x82	Error: Bootblock checksum error
0x90	Error: Error to shutdown
0x91	Error: Error to restart...
0x92	Error: Can't open ROM ID file
0x93	Error: Invalid MAC address
0x94	Error: Invalid MAC address
0x95	Error: Invalid load current CMOS option
0x96	Error: Invalid retry count
0x97	Error: Invalid defined ROM ID length
0x98	Error: Invalid SMI
0x99	Error: ROM File ID don't exist
0x9A	Error: System ROM ID don't exist
0x9B	Error: BIOS don't support SETUP preserve function
0x9C	Error: BIOS don't support SETUP preserve function
0x9D	Error: Store SETUP setting error
0x9E	Error: Restore SETUP setting error
0x9F	Error: Cannot analyze ROM file. ROM file may be corrupted
0xA0	Error: Cannot analyze the ME Data. ROM file may be corrupted
0xA1	Error: BIOS does not support ME Entire Firmware update
0xA2	Error: BIOS does not support ME Ignition Firmware update
0xA3	Error: Invalid EC ROM file
0xA4	Error: EC ROM file checksum error
0xA5	Error: Can't entry EC flash mode
0xA6	Error: Erasing EC flash memory fail
0xA7	Error: Initial EC programming fail
0xA8	Error: EC flash data transmit error
0xA9	Error: Writing EC flash memory fail
0xAA	Error: Exit EC programming mode fail
0xAB	Error: ROM Chip ID mismatch
0xAC	Error: Invalid EC Header Table
0xAD	Error: EC does not permit BIOS update
0xAE	Error: BIOS doesn't support OEMCMD function
0xAF	Error: Store DMI Data error
0xB0	Error: Restore DMI Data error
0xB1	Error: Invalid Activation Key file.
0xB2	Error: File Size is greater than image activation key length.
0xB3	Error: Image activation key larger than BIOS activation key.
0xB4	Error: Activation Key checksum error.