

aFlasher32

Flash Download Program for
E-OCD II Debugger

User's Manual

Version 1.0.1

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1 Overview

1.1 aFlasher32 Program

Flash download program 'aFlasher32' supports users who use A-Link/ A-Link Pro. The users can select a device to load and download a corresponding Hex file.

A-Link/ A-Link Pro adaptor is a USB CMSIS-DAP Debugger and Programmer (which uses SWD interface). The device can be used as a debugging adaptor for ARM Cortex chip or a simple on-board programmer. For details, please refer to the A-Link/ A-Link Pro Hardware Manual.

Designed to help device programming, the A-Link/ A-Link Pro aFlasher32 features:

- A-Link: Availability for in-system programming (See **3.5 Device Programming in PC Mode (ISP)**).
- A-Link Pro: Availability for both in-system programming (See **3.5 Device Programming in PC Mode (ISP)**) and on-field programming (See **3.6 Device Programming in Standalone Mode (on-field programming)**).
- Automatic detection of the type of the A-Link/ A-Link Pro dongle when connected.

1.2 System Requirements

The aFlasher32 is compatible with the following operating systems.

- Microsoft Windows Vista
- Microsoft Windows 7
- Microsoft Windows 8 & 8.1
- Microsoft Windows 10

This software can be run on a basic PC and does not require powerful specifications. However, the PC performance affects the USB communication speed.

2 Installation

2.1 Program Download

Users can download the installer at the ABOV's website. It is ideal for users to always have the latest version of the software, as ABOV continues to add new devices and features.

Setup file's name shows the version number and generated date. For example, the setup file "Setup_aFlasher32_V1.234.56(201012).exe" indicates the following information in the file name:

- The installer is for the aFlasher32 programmer S/W package.
- Its version is 1.234.56. Of these version numbers, each number divided by a period has the meaning listed below:
 - Major version = 1
 - Minor version = 234,
 - Patch version = 56
- It was released on October 12, 2020.

Once the aFlasher32 application is launched, it searches for newer versions from the ABOV website. When it finds a newer version, it informs to users.

2.2 Program Installation

Once the program installation is finished, users can see the message shown in Figure 1. Users can run the installer without demanding software license nor a driver.

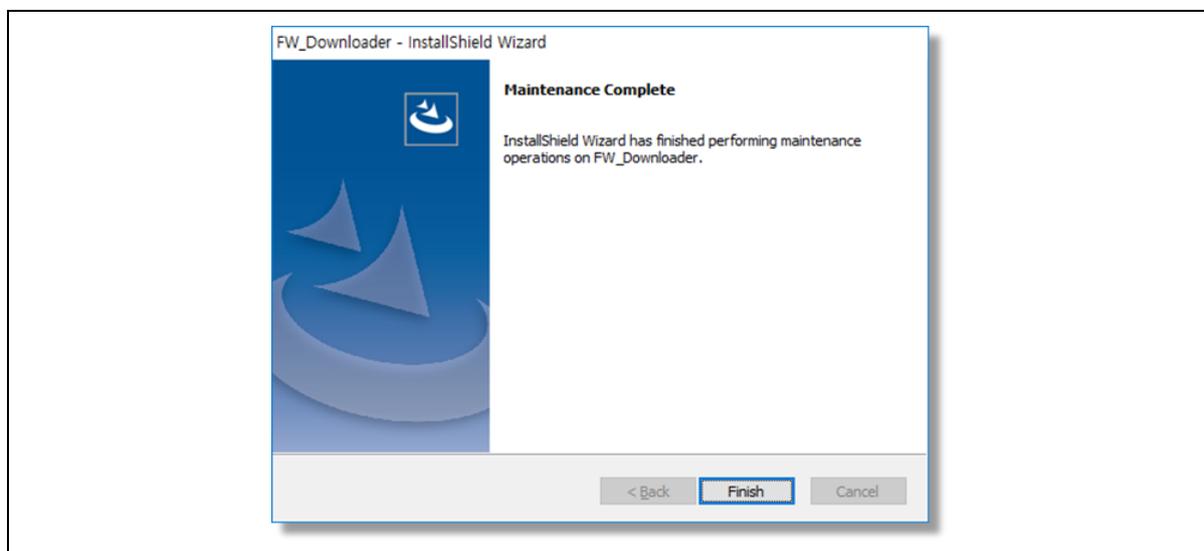


Figure 1. Run Downloaded Installer

3 How to Use aFlasher32 Program

3.1 Overview

First when users start the aFlasher32 program, the users can see the Start menu as shown in Figure 2. There are several functions supported by the aFlasher32 as presented in the Start menu and listed below:

- Device Selection & Load Hex file
- Status Information
- Mode Selection
- Device Programming
- Hex Viewer

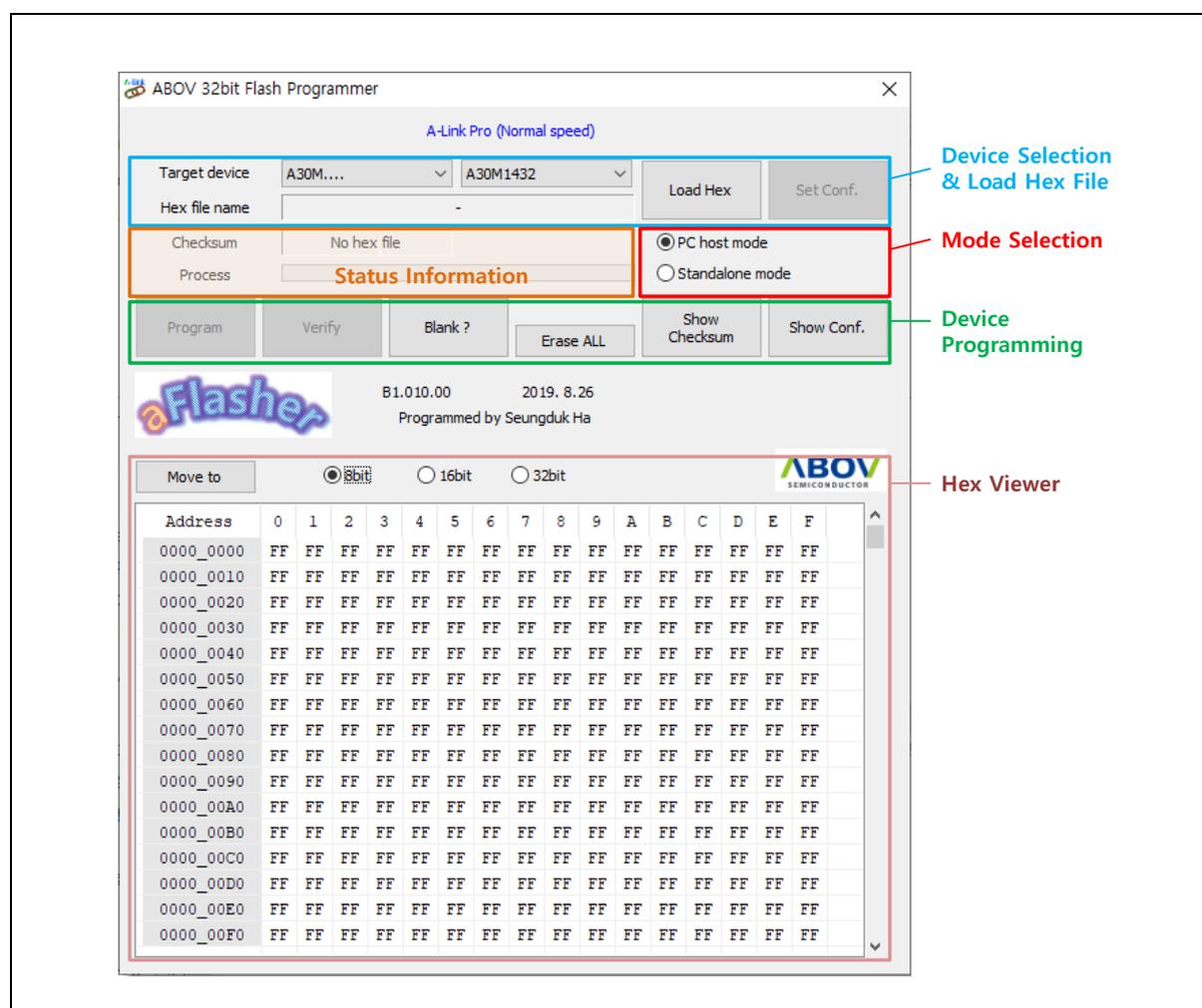


Figure 2. aFlasher32 Program

3.2 Device Selection and Load Hex File

3.2.1 Target Device Series Selecting

Users must select a target device before loading a Hex file. To select a desired device, users must select a series first and then select a device in a 'Target device' field.

Figure 3 shows how to select a series that includes a target device. As shown in the figure, select a series that includes the target device from the 1st drop down menu. Then, select the target device in the 2nd drop down menu.

Since the lists of the series and devices vary depending on the version of the program, it is recommended that users download and install the latest version.

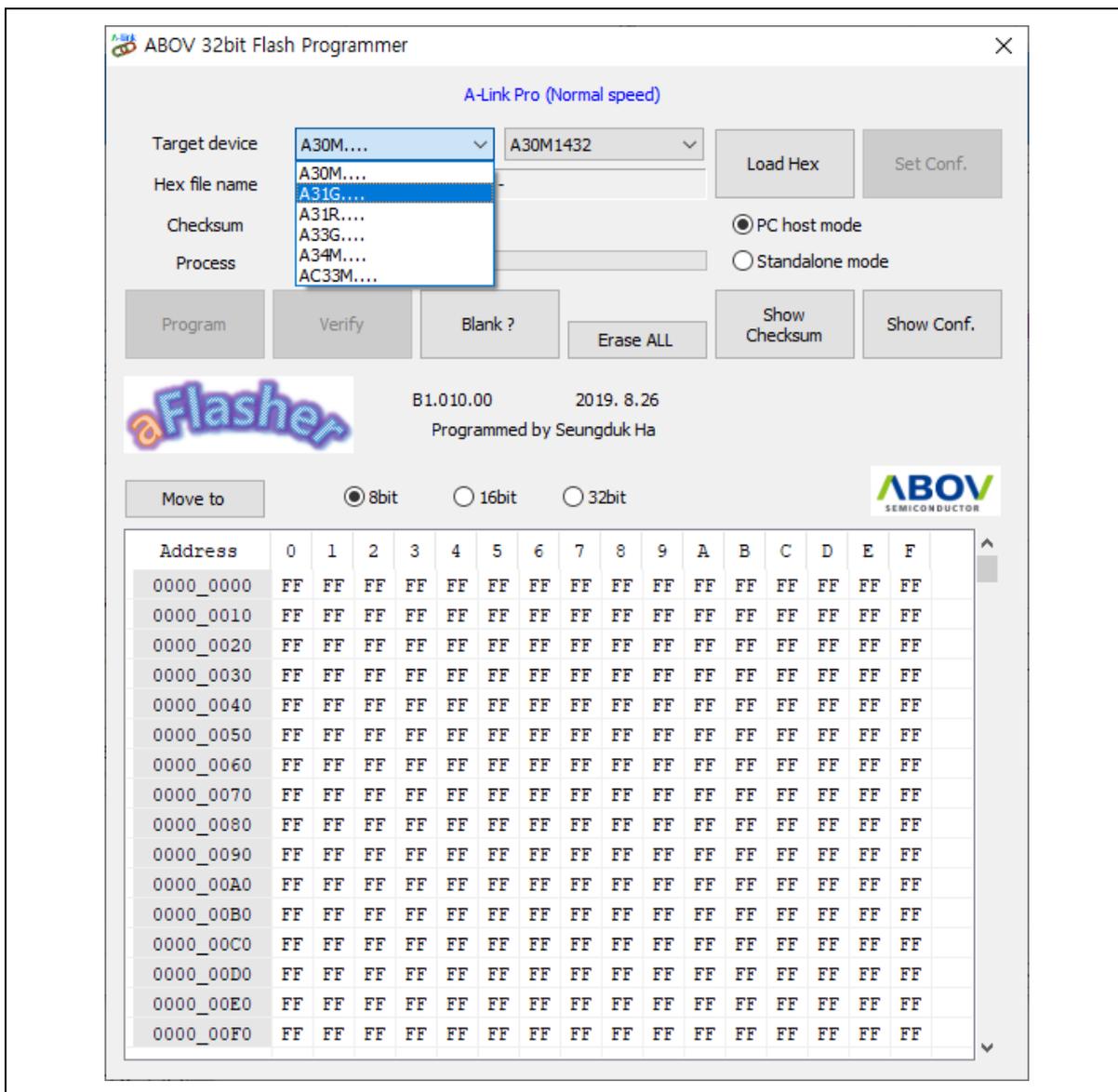


Figure 3. Target Device Series Selection

3.2.2 Device Selection

As shown in Figure 4, users can select the target device from the 2nd list of the ‘Target device’ field. The 2nd list presents devices that are included in the selected series.

For example, if a user want to select a A31G112 device as a target device, the user must select ‘A31G...’ first in the 1st drop down menu, and then select ‘A31G112’ in the 2nd drop down menu as shown in Figure 4.

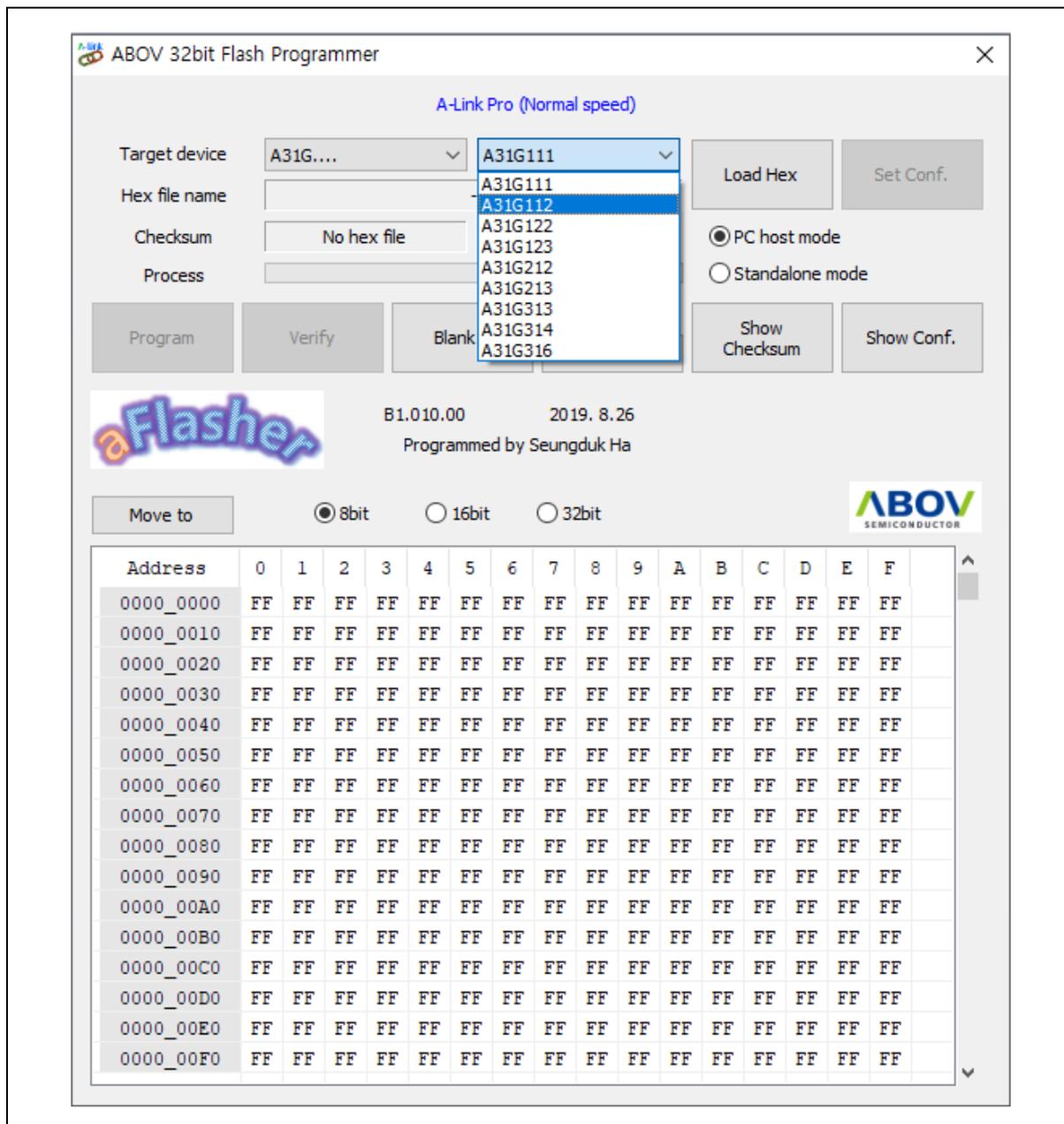


Figure 4. Device Selection

3.2.3 Load Hex File

Once a target device is selected, it is time to load a Hex file that a user wants. As shown in Figure 5, use the 'Load Hex' button to load a Hex file.

Since a Hex file does not have the Device Configuration Data, users need to click on the 'Set Conf.' button if they want to insert the Device Configuration Data in the Hex file or edit.

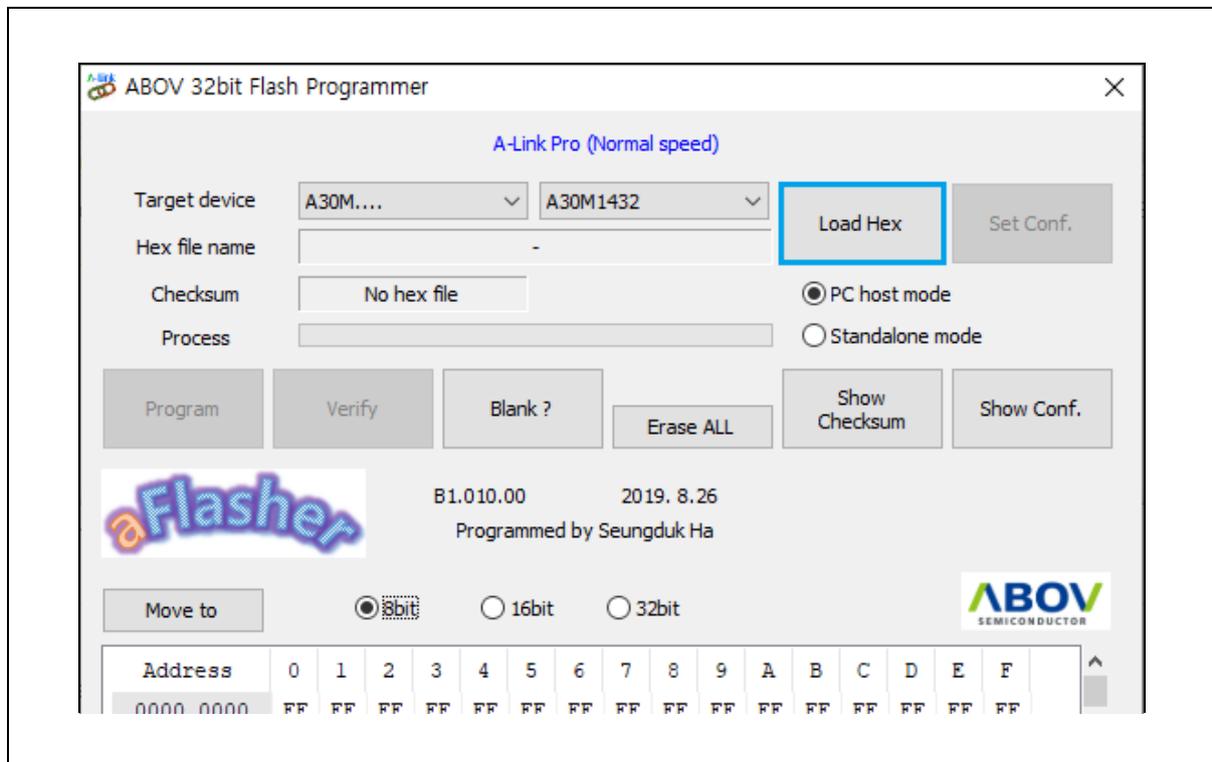


Figure 5. Load Hex File

3.2.4 Set Configuration Data

As described in the previous section, a Hex file does not have the Device Configuration Data. Users need to click on the 'Set Conf.' button to insert the Device Configuration Data in the Hex file or edit the file. Users can learn more of the settings by reference of a User's Manual of the corresponding device.

In Figure 6, the (a) shows an example window when the 'Set Conf' button is pressed for A31G1xx series. When the 'Set Conf' button is pressed for other devices than A31G1xx series, a window of the Read Protection settings shown in the (b) is displayed.

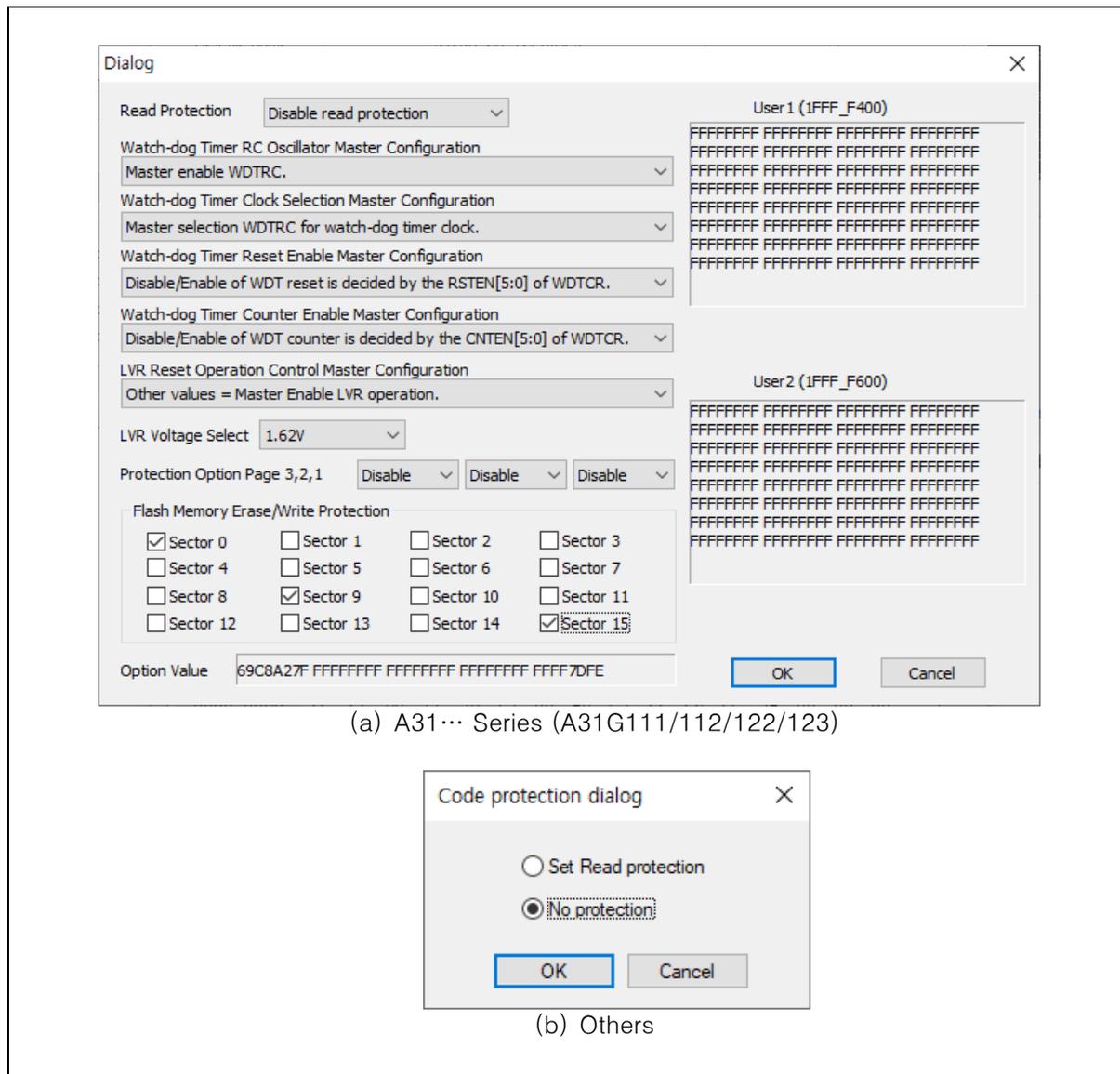


Figure 6. Example

3.3 Status Information

aFlasher32 program shows three information of the Hex file that a user loaded. The three kinds of information are as follows:

- Hex file name: It shows a name of a Hex file that was loaded most recently.
- Checksum: It shows a Checksum Value of a Hex file that was loaded most recently. By checking this value, users can confirm whether the Hex file was loaded normally.
- Process: It shows the current process that aFlasher32 program is performing.

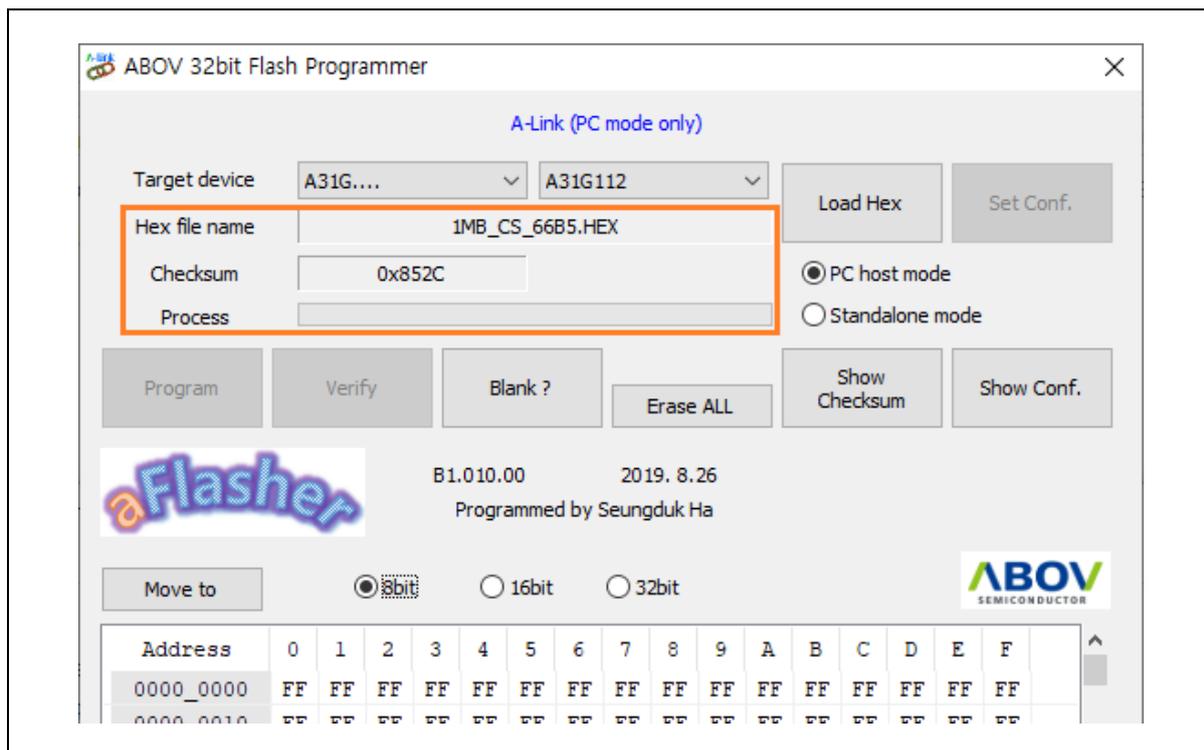


Figure 7. Status Information

3.4 Mode Selection

3.4.1 PC Host Mode

It supports programming the target device from the PC host. The target device is programmed with a Hex file and configuration data via the USB interface.

For USB communication, standard CMSIS-DAP commands are used. PC host mode is supported both A-Link and A-Link Pro, but its programming speed is relatively slow because all data and commands are transferred through a USB HID interface. Another professional programmers (for example, E-PGM+) are recommended for better ISP performance.

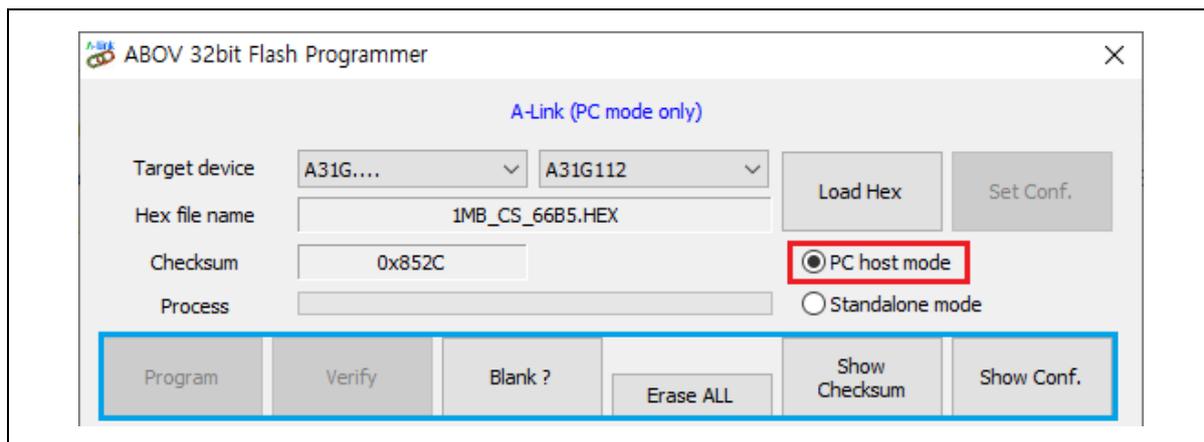


Figure 8. Select 'PC Host Mode'

3.4.2 Standalone Mode

It sends the programming algorithm to the main controller of A-Link Pro hardware. It also sends the target device's Hex file and configuration data to the external flash memory of the A-Link Pro hardware. It is enabled when A-Link Pro is detected, and changes the dongle over to a standalone programmer that operates without a PC.

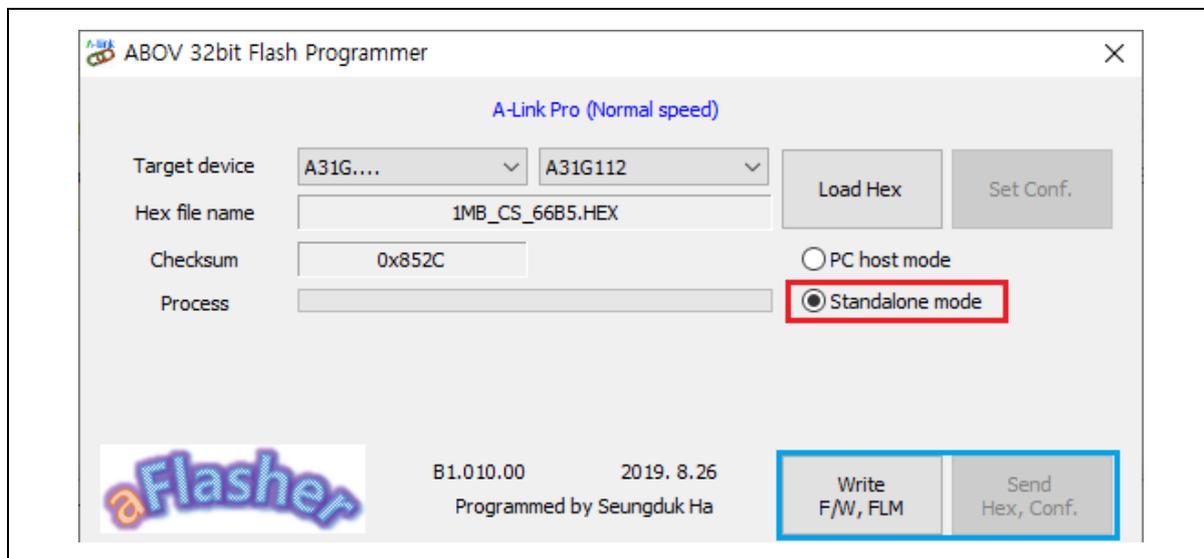


Figure 9. Select 'Standalone Mode'

3.5 Device Programming in PC Mode

When users select the PC host mode, buttons related Programming are activated as shown in Figure 10.

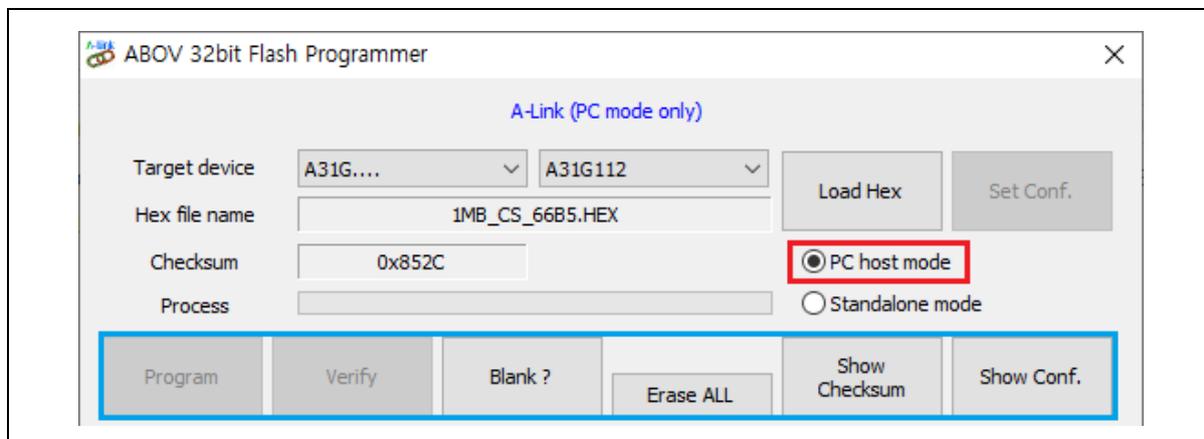


Figure 10. Select 'PC Host Mode'

3.5.1 Button 'Program'

Click this button to start programming a target device. This button remains disabled until a Hex file is loaded.

The programming sequence is as follows:

1. Erase all contents of the target device.
2. Send Hex data to program the target device.
3. Verify the target device for each byte.
4. Send device configuration to program the target device if available.
5. Verify the target device configuration bytes.

3.5.2 Button 'Verify'

Click this button to start verifying a target device checksum and configuration. This button remains disabled until a Hex file is loaded.

The verification sequence is as follows:

1. Verify the target device for each byte.
2. Verify the target device configuration bytes.

3.5.3 Button 'Blank?'

Using this button, users can check whether a target device is blank.

The blank sequence is as follows:

1. Verify whether the target device is blank or not.
2. Verify whether the target device configuration is blank or not.

3.6 Device Programming in Standalone Mode

When users select the Standalone mode, buttons related Programming are activated as shown in Figure 11. A-Link Pro debugger operates as the Standalone Mode when the Standalone mode is activated.

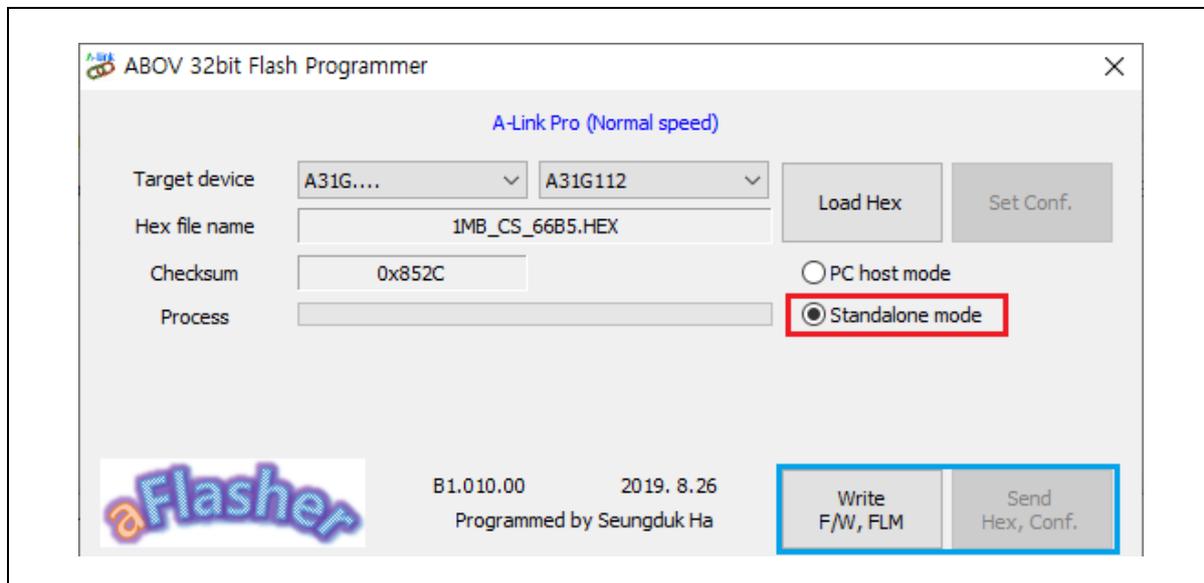


Figure 11. Select 'Standalone Mode'

3.6.1 Button 'Write F/W, FLM'

Click this button to send the following data:

- Dongle firmware to enable standalone mode programming. This includes a programming control algorithm specific to each device.
- Flash loader for programming the target device. It is executed on the target device's internal RAM.

3.6.2 Button 'Send Hex, Conf.'

Click this button to send the following data :

- Hex data for target flash code memory.
- Device configuration data.

3.7 Hex Viewer

aFlasher32 Program provides a function of Hex Viewer as shown in Figure 12. The Hex Viewer is located in the low of the Start menu, and shows Hex Data and Configuration Buffer values of the Hex file (Code) that is loaded. Users can select a unit for the Hex Data and view it using the unit.

The Hex Viewer is not edited to prevent keyboard inputs due to carelessness.

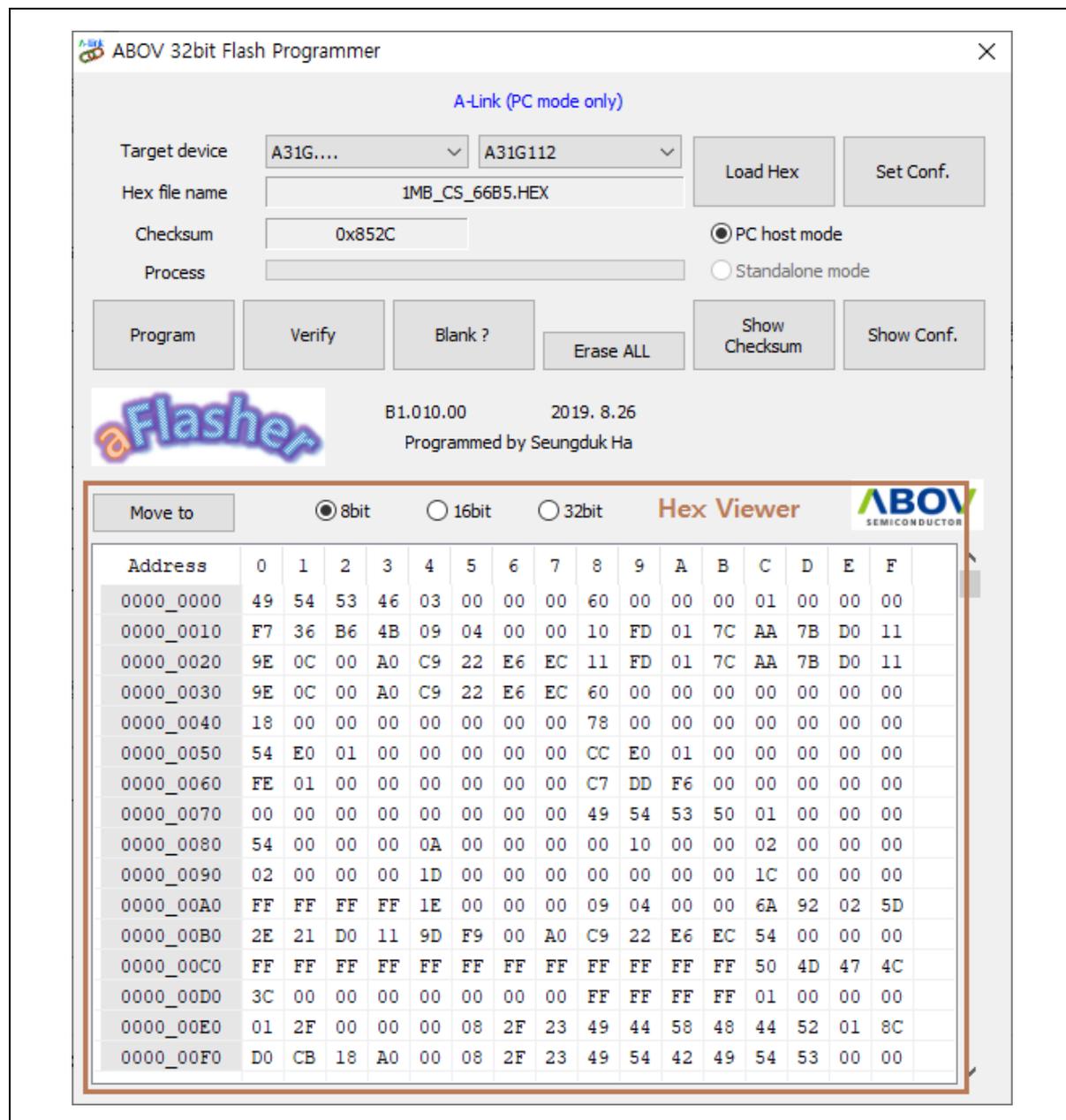


Figure 12. Hex Viewer

3.7.1 Button 'Move to'

On the Hex Viewer, users can move the Start address of screen output to the address that users want. To do this, click on the 'Move to' button.

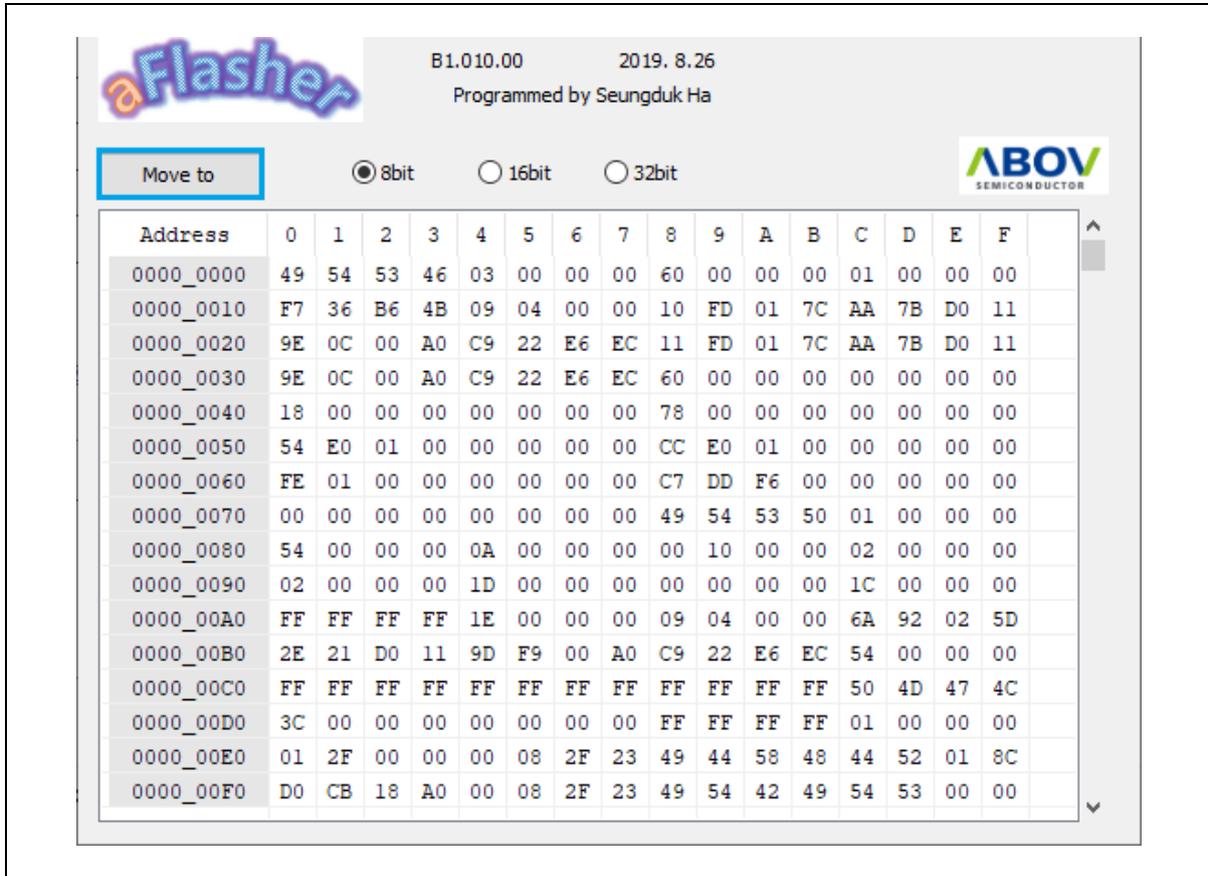


Figure 13. Button 'Move to'

When pressing the button, the 'Move to' dialog window displays on the screen. The address input value is 32-bit long by default.

On the Address input dialog window, the address input value is required to be divided into Upper 16-bit address and Lower 16-bit address as shown in Figure 14. After entering the address that users want, click on the 'OK' button.

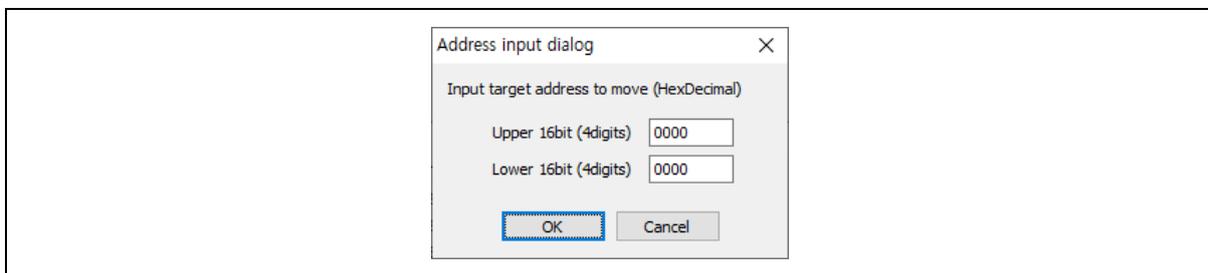


Figure 14. Dialog Window 'Move to'

3.7.2 Data Unit Selection

Users can select a Data Unit and use it to view the Code on the Hex Viewer. 8-bit, 16-bit, and 32-bit Data Units are available for the selection.

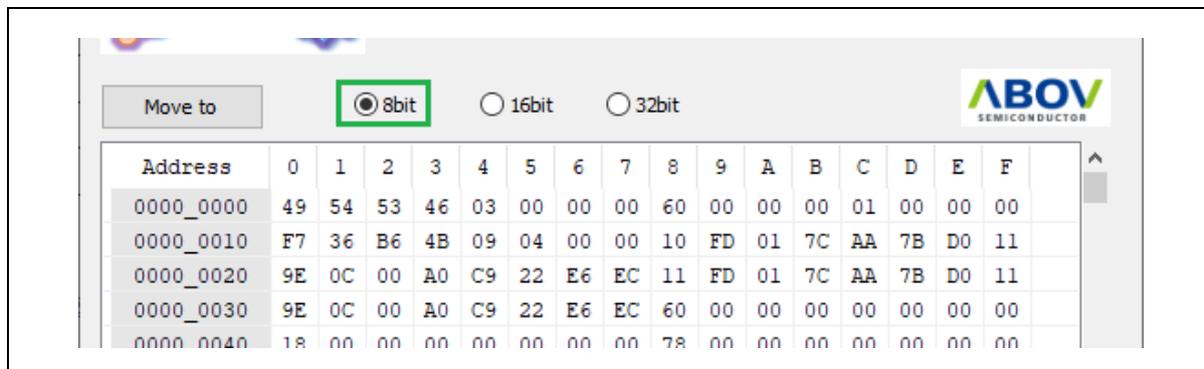


Figure 15. 8-bit Data Unit (Two Hex Digits)

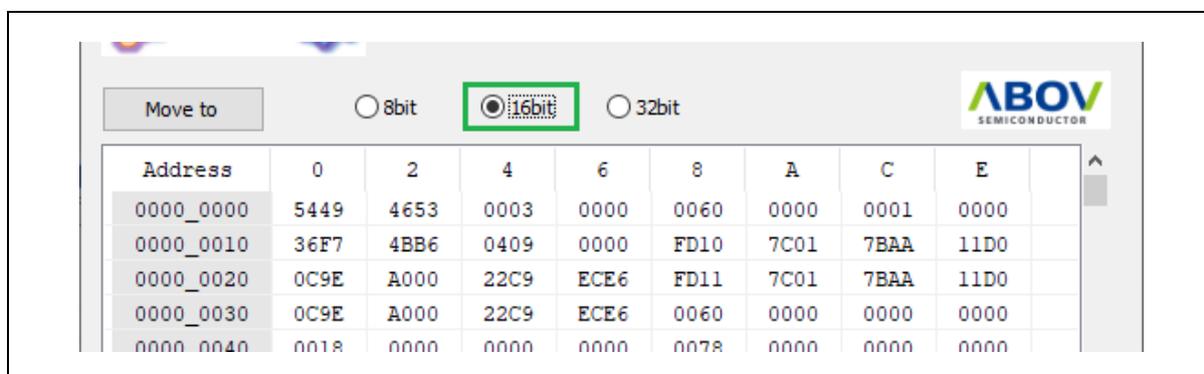


Figure 16. 16-bit Data Unit (Four Hex Digits)

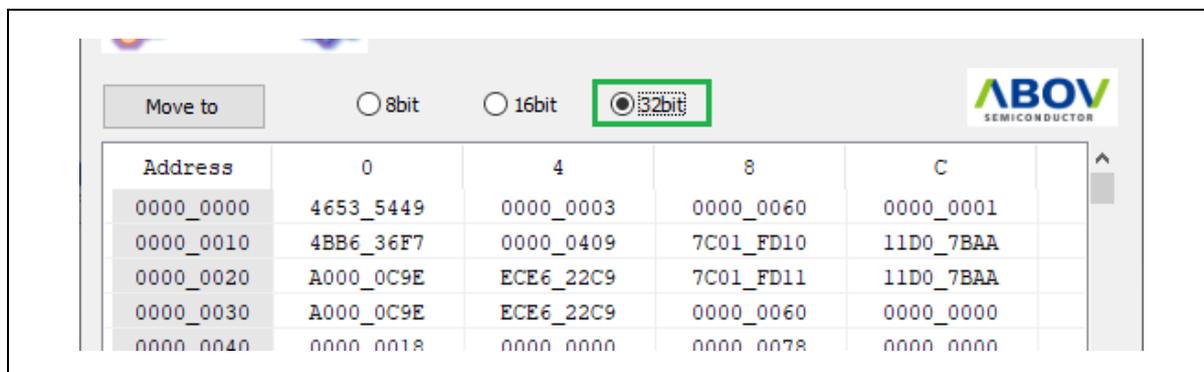


Figure 17. 32-bit Data Unit (Eight Hex Digits with the Under-bar for Readability)

4 Programming Precautions

4.1 Precautions

If a target device is powered before aFlasher32 starts control, the target device is running User Mode. This means that aFlasher32 cannot control the target device.

Both in PC Host Mode and in Standalone Mode, A-Link or A-Link Pro is powered from the target system's power source because it does not include a power generator and power control circuit. Especially, A-Link Pro's Standalone Mode relies only on the target system's power source.

Basically, the SWD interface uses VCC, VSS, SWCLK, and SWDIO. There are two optional pins (nReset and Boot) to improve the SWD interface connection. If the user code changes SWD I/O to GPIO, A-Link/A-Link Pro cannot initialize the target system because the target system is already running the user code and SWD interface is impossible.

Refer to the following:

- Device pin : nReset
 - We recommend connecting the nReset signal between the target device and A-Link / A-Link Pro.
 - If the target device's nReset is connected with a RESET IC directly, it conflicts with the A-Link/A-Link Pro nReset control signal. In this case, disconnect the RESET IC.
- Device pin : Boot
 - We recommend connecting the Boot pin to Boot Mode.
 - The Boot Mode port controls the booting order of the target device.
 - The booting code sets the GPIO port to the SWD port by default.

4.2 Avoid damage to A-Link/ A-Link Pro

A-Link and A-Link Pro do not include a power control circuit. So, you have to be aware of the following:

- A-Link and A-Link Pro does not support hot plugging. When the target system is powered, plugging A-Link or A-Link Pro may damage their hardware permanently.
- If the target device's read protection has been set, it cannot be programmed. In this case, use a POR (power on reset) and try programming again.
- A-Link and A-Link Pro are simple and cheap tools. They are suitable for use for a small number of units at the pre-production phase, but their protection circuits are not strong enough to endure mass production. For mass production, E-PGM+ or a third-party programmer is recommended.

Revision History

Version	Date	Description
1.0.0	Sep. 10, 2019	Last revised
1.0.1	Dec. 11, 2020	New format applied document.

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