

TMX320F2810/F2812 Alpha Flash Programming Utilities

The alpha flash utilities are intended for TMX product evaluation purposes.

These algorithms currently work with the SDFlash utility. SDFlash is a product Spectrum Digital Inc. (www.spectrumdigital.com).

Release Notes:

- ❑ The TMX F2810/12 Alpha programming utilities require an **XCLKIN of 30MHz** and the **PLL must be enabled (XF_XPLLDIS = 1 at reset)**. The programming utilities will automatically change the PLL multiplier to x 10/2 for a SYSCLKOUT of 150MHz. Failure to meet this requirement can affect your ability to erase or program the flash.

The ability to configure the utilities for different clock speeds will be provided in a future release.

- ❑ Some traditional programming utilities had separate operations for “Clear” and “Erase”. These two operations have been combined into one operation referred to only as “Erase”.

Note: The CSM will be permanently locked if the CSM password locations are loaded with all 0x0000 and the device is secured. During the combined “Erase” function, a sector clear is immediately followed by an erase operation without resetting the device. This will help avoid permanently locking the CSM. Do not program the CSM passwords with all 0x0000.

- ❑ Erase/Program/Verify of the OTP memory is not supported at this time. It will be available in a future release.
- ❑ An API and Code Composer Plug-in are not provided at this time. They will be available in a future release.
- ❑ You should not run SDFlash and Code Composer at the same time. Else, you would have two different applications trying to control the DSP.
- ❑ The utilities will disable the watchdog and interrupts. SDFlash will have complete control of the device during programming. That is no user application code can be running in parallel.
- ❑ Install File Directories:

<INSTALLDIR>\SDConfig	- Root level for emulator configuration
<INSTALLDIR>\SDFlash	- Root level for flash programmer
<INSTALLDIR>\SDFlash\bin	- SDFlash .exe, .dvr and .dat files
<INSTALLDIR>\SDFlash\projects	- Sample F2810 and F2812 flash project files
<INSTALLDIR>\SDFlash\algo\28x\doc	- Documentation (this file)
<INSTALLDIR>\SDFlash\algo\28x\2810\flash28	- F2810 programming algorithm
<INSTALLDIR>\SDFlash\algo\28x\2810\image	- F2810 sample image file for programming the flash
<INSTALLDIR>\SDFlash\algo\28x\2812\flash28	- F2812 programming algorithm
<INSTALLDIR>\SDFlash\algo\28x\2812\image	- F2812 sample image file for programming the flash

Quick Start:

For a quick start do the following:

- 1) Run SDConfig to make sure your target/emulator are setup properly.
- 2) Run SDFlash.
- 3) Load an existing project, File->Open Project. Browse to "<INSTALLDIR>\specdig\sdf\flash\projects" and select the F2810 or F2812 sample project.

The sample projects erase, program, and verify each sector on the device. The image programmed into the device is a data = address pattern. The code security module password locations are left erased (all FFFF's) so that the CSM can easily be unlocked.

- 4) If you changed your emulator settings in SDConfig then do the following:
 - ☐ Project->Settings->Emulator Address/ID
 - ☐ Select the current setting or a new setting if it does NOT match your SDConfig setting.
 - ☐ Then select OK. You should get a message that the current driver was unloaded and a new driver has been loaded.

This operation is required to "sync" SDFlash project settings to SDConfig settings.

- 5) Reset your target with, Device->Reset. You will get a pass/fail message in the output window.
- 6) Program your device with, Device->Flash.

Check or un-check the operation(s) you want to perform then select start. Each checked operation is executed from left to right, with continue on success and abort on fail. You can abort any operation by pressing stop.

- 7) You can view the programmed data with, Buffer->Target Load, fill in the start and end address and the memory page/space. Then do View->Target Buffer. You can view a maximum of 32K words. If you want to view more then reissue Buffer->Target Load with new parameters

Selecting Which Sectors To Erase

For the erase operation, User Option 1 indicates which sectors should be erased prior to programming. This information is provided in the form of a mask value where set bit indicates that the sector will be erased.

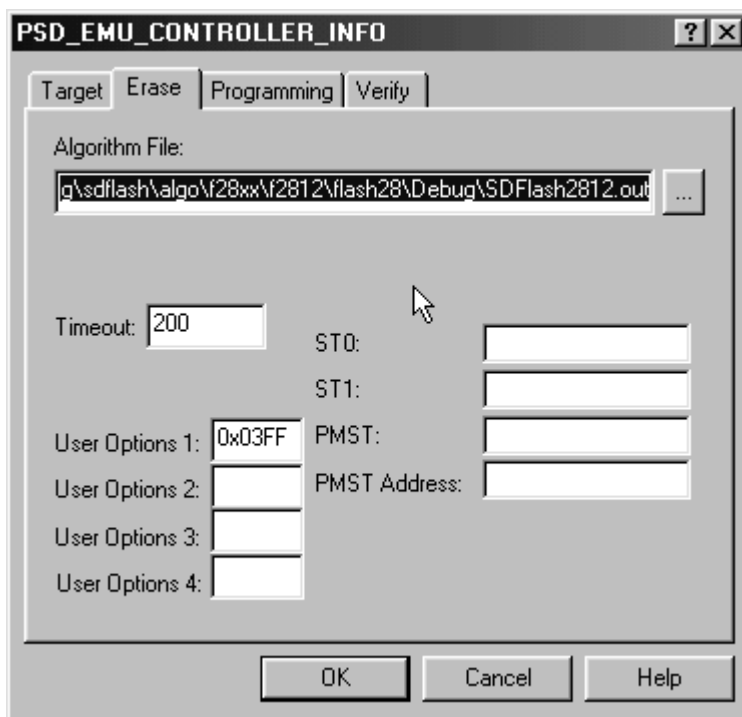
This mask is entered from the Project -> Settings menu. For the example shown on the right, all sectors for the F2812 would be erased prior to programming.

F2810 Sectors:

F2810 Sector Mask Value:

Bit 0 = Erase Sector A
 Bit 1 = Erase Sector B
 Bit 2 = Erase Sector C
 Bit 3 = Erase Sector D
 Bit 4 = Erase Sector E
 Bit 5-15 = ignored

F2810 Sector Addresses:



ADDRESS RANGE	PROGRAM AND DATA SPACE
0x3E 8000 0x3E BFFF	Sector E, 16K x 16
0x3E C000 0x3E FFFF	Sector D, 16K x 16
0x3F 0000 0x3F 3FFF	Sector C, 16K x 16
0x3F 4000 0x3F 5FFF	Sector B, 8K x 16
0x3F 6000	Sector A, 8K x 16
0x3F 7FF6 0x3F 7FF7	Boot-to-Flash Entry Point (program branch instruction here)
0x3F 7FF8 0x3F 7FFF	Security Password (128-Bit)

F2812 Sectors:**F2812 Sector Mask Value:**

Bit 0 = Erase Sector A
 Bit 1 = Erase Sector B
 Bit 2 = Erase Sector C
 Bit 3 = Erase Sector D
 Bit 4 = Erase Sector E
 Bit 5 = Erase Sector F
 Bit 6 = Erase Sector G
 Bit 7 = Erase Sector H
 Bit 8 = Erase Sector I
 Bit 9 = Erase Sector j
 Bit 10-15 = ignored

F2812 Sector Addresses:

ADDRESS RANGE	PROGRAM AND DATA SPACE
0x3D 8000 0x3D 9FFF	Sector J, 8K x 16
0x3D A000 0x3D BFFF	Sector I, 8K x 16
0x3D C000 0x3D FFFF	Sector H, 16K x 16
0x3E 0000 0x3E 3FFF	Sector G, 16K x 16
0x3E 4000 0x3E 7FFF	Sector F, 16K x 16
0x3E 8000 0x3E BFFF	Sector E, 16K x 16
0x3E C000 0x3E FFFF	Sector D, 16K x 16
0x3F 0000 0x3F 3FFF	Sector C, 16K x 16
0x3F 4000 0x3F 5FFF	Sector B, 8K x 16
0x3F 6000	Sector A, 8K x 16
0x3F 7FF6 0x3F 7FF7	Boot-to-Flash Entry Point (program branch instruction here)
0x3F 7FF8 0x3F 7FFF	Security Password (128-Bit)

Troubleshooting Tips:

1) All Operations:

- ☐ Run SDConfig to make sure your target/emulator are setup properly.
- ☐ Make sure the utility can unlock the Code Security Module (CSM). The algorithm attempts to unlock the CSM before an erase, program, or verify operation. The algorithm uses the keys provided in the SDFlash28x_CsmKeys.asm file to attempt to unlock the CSM. By default the password locations are all erased (FFFFs). It is suggested that the CSM passwords be left erased (FFFFs) for initial development. Refer to the System Control and Interrupts Peripheral Reference Guide for details.
- ☐ Make sure that XCLKIN is 30MHz and that the PLL is enabled. Observe XCLKOUT during the operation. XCLKOUT is SYSCLKOUT/4 at reset. Thus, after the algorithms initialize XCLKOUT should be 150MHz/4.
- ☐ SD Flash should have full control of the device. That is no user application should be running, no interrupts firing and CCS should be shut down, etc prior to using SDFlash.
- ☐ Make sure that VDD3VFL = 3.3V. This voltage is required for read operations as well as programming.
- ☐ Check the part using Code Composer Studio. Using CCS, check the SARAMS and that you can unlock the CSM.

2) Erase Fails:

- ☐ Make sure a valid sector mask is specified for User Option 1 for the erase operation. At least one sector must be specified.

3) Programming Fails:

- ☐ Check to make sure you are not programming a region of memory outside of the flash. To see what sections SDFlash will program, use the View->Coff/Hex File Status utility and look for sections labeled "load" outside of the flash memory region. Refer to the Linker in the C28x Assembler Reference Guide for more information on preparing your code for programming.
- ☐ Make sure you erased the sectors being programmed prior to programming them.

4) Verify Fails:

- ☐ Check that algorithm is able to unlock the CSM. If you programmed new passwords this may no longer be the case. To avoid having to change the CSM passwords for different operations, It is suggested that the CSM passwords be left erased (FFFFs) for initial development.