



SmartDesign MSS

Configurator Overview

Doc Version 1.0

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Introduction

The SmartDesign MSS Configurator is a specialized SmartDesign for MSS configuration. If you are familiar with SmartDesign then the MSS Configurator will be very familiar.

This document explains the overall flow for using the MSS Configurator, as well as the details on how to use the SmartDesign MSS Configurator.

The MSS Configurator allows you to configure your SmartFusion Microcontroller subsystem, including peripheral configuration, MSS I/O settings, and firmware generation.

The MSS Configurator has multiple views, each allowing configuration of a different part of your Microcontroller Subsystem design. The views are:

- **Canvas** – Graphical block diagram of SmartFusion Microcontroller Subsystem
- **I/O Editor** – I/O attribute editor for MSS I/Os
- **Firmware** – Compatible firmware

For details on how to use each view, refer to the appropriate section below.

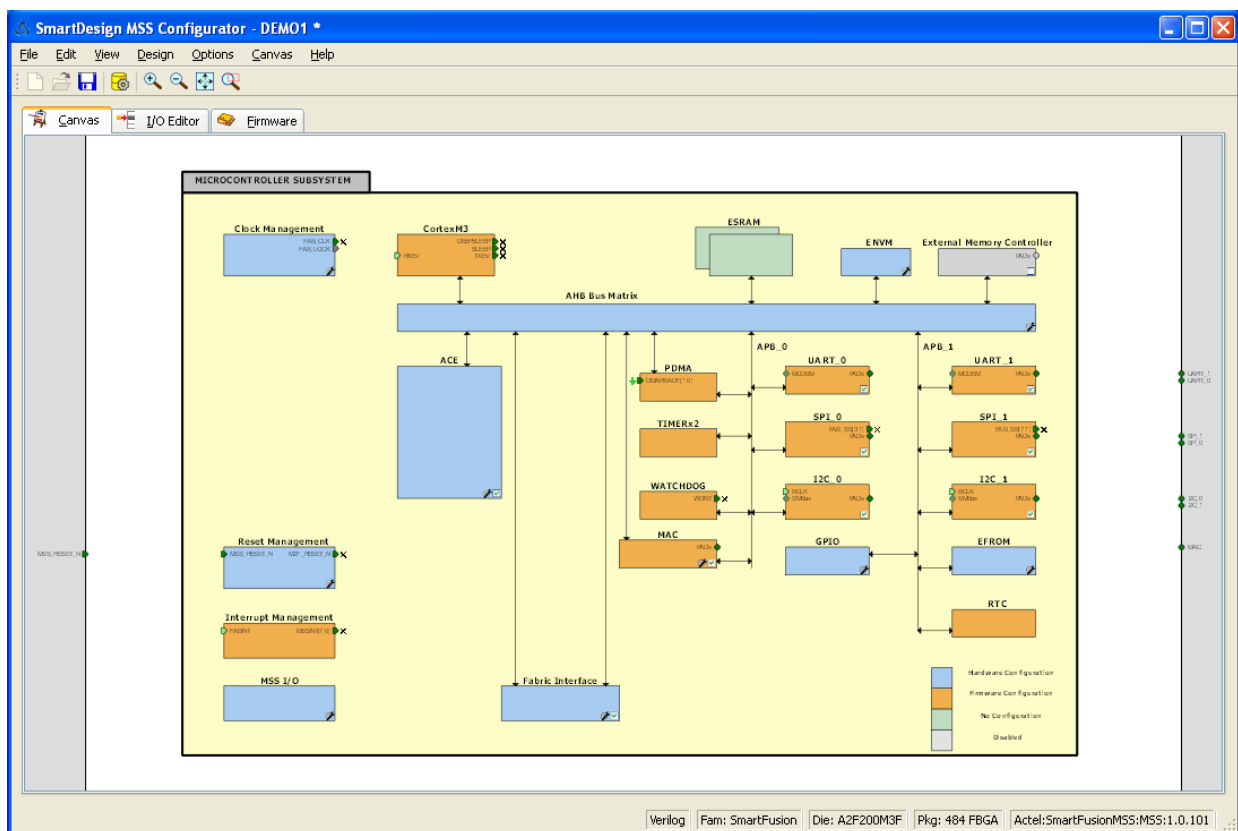


Figure 1: SmartDesign MSS Configurator

Design Flow

There are two basic design flows when designing with SmartFusion MSS. Most users will use the Libero® IDE tool suite to design their MSS configuration and fabric extension, this is explained in the MSS Configuration with Peripheral Extension below.

Users who are more focused on embedded software development have the option of using the MSS configurator in a standalone configuration, integrated into your Software tool suite. This is described in the Standalone MSS Configuration section later in this document. It is important to point out that in Standalone mode, you will only be able to affect the MSS configuration and not your FPGA fabric.

Libero Flow - MSS Configuration with Peripheral Extension

In this flow, you will use the SmartDesign MSS Configurator that is integrated into the Libero IDE tool suite. The following flow diagram illustrates the design flow:

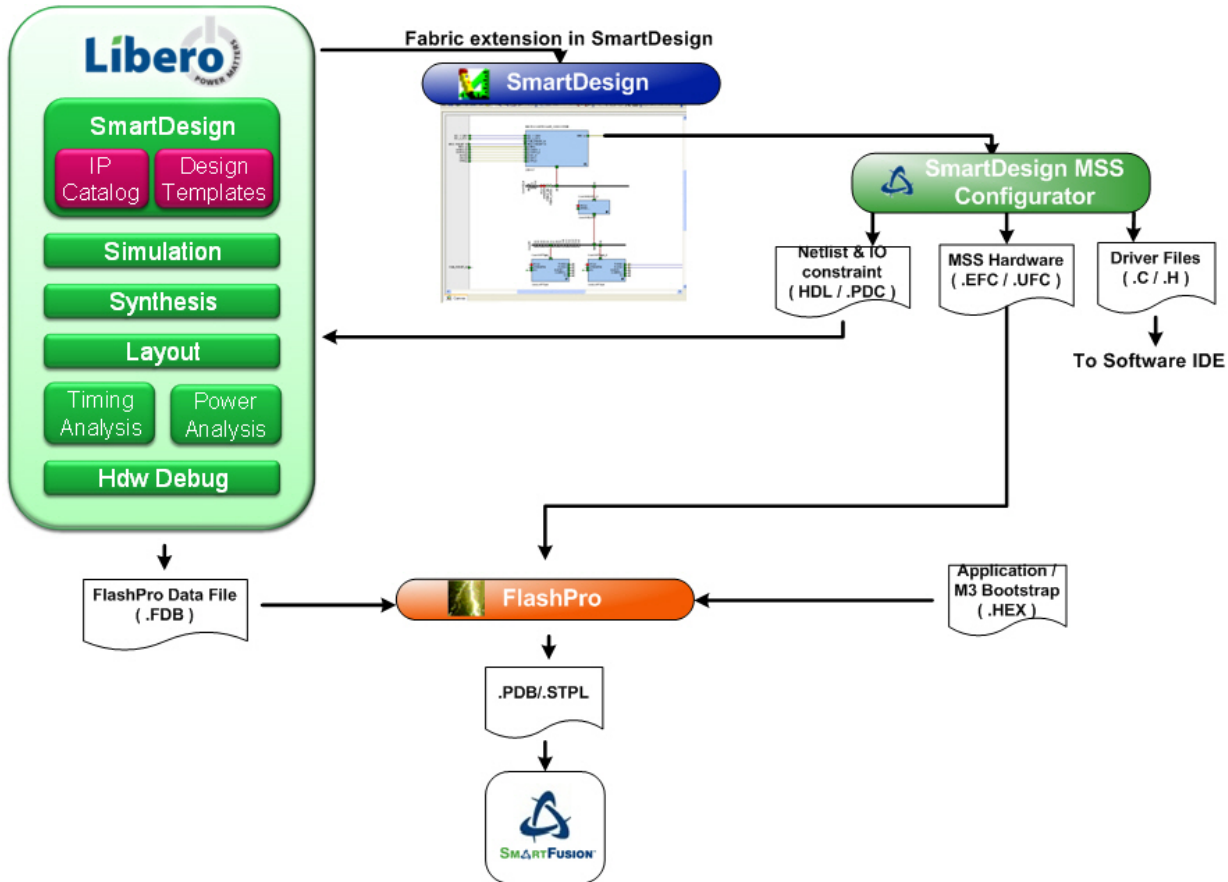


Figure 2: SmartFusion MSS Configuration in Libero IDE

Note that FlashPro/SmartDesign/SmartDesign MSS Configurator tools are shown separately from Libero IDE to clarify the design flow diagram. These tools are actually integrated and managed within the Libero IDE tool suite.

You will need to use this flow if you want to add any logic in your FPGA fabric. As the above diagram illustrates, your MSS configuration is performed using the SmartDesign MSS Configuration tool. Once that is complete, you will then use the regular SmartDesign and Libero IDE tools to add the FPGA fabric portion of your design. The files are described in more detail in the Generation section below.

[Refer to the tutorials](#) for details on how to create a SmartFusion design.

Standalone MSS Configuration

In this flow, you use the SmartDesign MSS Configurator and integrate it into your Software tool suite, such as, SoftConsole, Keil, or IAR Embedded Workbench. The following flow diagram illustrates the design flow:

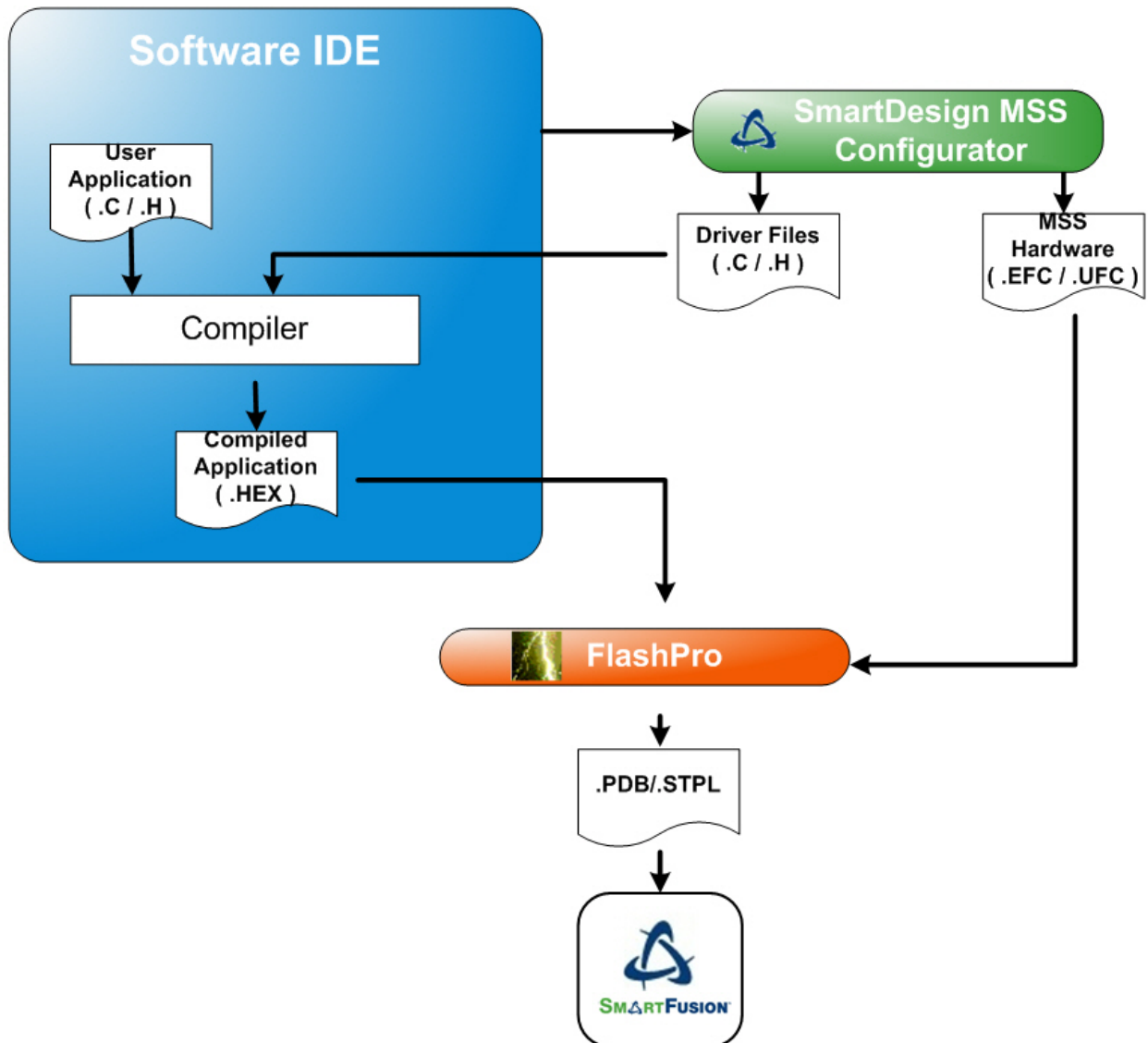


Figure 3: SmartFusion MSS Configuration Standalone Flow

You can use this flow if you will only be working with the embedded software development portion of your SmartFusion design. By integrating the MSS Configurator in your software environment, you can make configuration changes to the MSS as well as use it to generate the required driver files for your design. The files are described in more detail in the Generation section below.

Refer to the [Tutorials](#) section of the SmartFlow documentation for a short tutorial on how to use this flow.

Generation

After configuring your SmartFusion MSS, you can generate your design by clicking the Generate button. This produces all the necessary MSS files so that you can proceed through the rest of the design flow.

The MSS Configurator produces the following files:

- EFC: MSS configuration that is programmed into ENVM.
 - Generated by SmartDesign MSS Configurator to <project>\component\work\<mss>\MSS_ENVM_0\MSS_ENVM_0.efc
 - Used by FlashPro
- UFC: eFROM configuration that is programmed into eFROM
 - Generated by MSS Configurator eFROM to <project>\component\work\<mss>\MSS_UFROM_0\MSS_UFROM_0.ufc
 - Used by FlashPro
- PDC: MSS I/O constraint file.
 - Generated by MSS Configurator (exported only if there are any I/O constraints) to <project>\component\work\<mss>\<mss>.pdc
 - Used by Designer
- C/H: Design firmware and Fabric Memory Map.
 - Produced by MSS Configurator to <project>\firmware
 - Consumed by Software IDE (SoftConsole, Keil, IAR)

Important Information about eNVM User Pages Usage

The MSS configurator uses a certain number of user eNVM pages to store the MSS configuration. These pages are located at the top of the eNVM address space. The number of pages is variable based on your MSS configuration (ACE, GPIOs and eNVM Init Clients). Your application code should not write in these user pages as it will most likely cause a runtime failure for your design. Note also that if these pages have been corrupted by mistake, the part will not boot again and will need to be re-programmed.

The first 'reserved' address can be computed as follows. After the MSS has been successfully generated, open the eNVM configurator and record the number of available pages shown in the Usage Statistics group on the main page. The first 'reserved' address is defined as follows:

$$\text{first_reserved_address} = 0x60000000 + (\text{available_pages} * 128)$$

Options Menu

Note: this menu is only available when the SmartDesign MSS Configurator is launched independently of Libero IDE. When launched from Libero IDE, the SmartDesign MSS Configurator uses Libero IDE settings

Vault/Repositories Settings Dialog Box

Use this dialog box to view and set your Vault location, and add/remove repositories.

A vault is a local directory (either local to your machine or on the local network) that contains cores downloaded from one or more repositories.

A repository is a location on the web that contains cores that can be included in your design.

Click **Repositories** to add or remove repositories, as shown in the figure below.

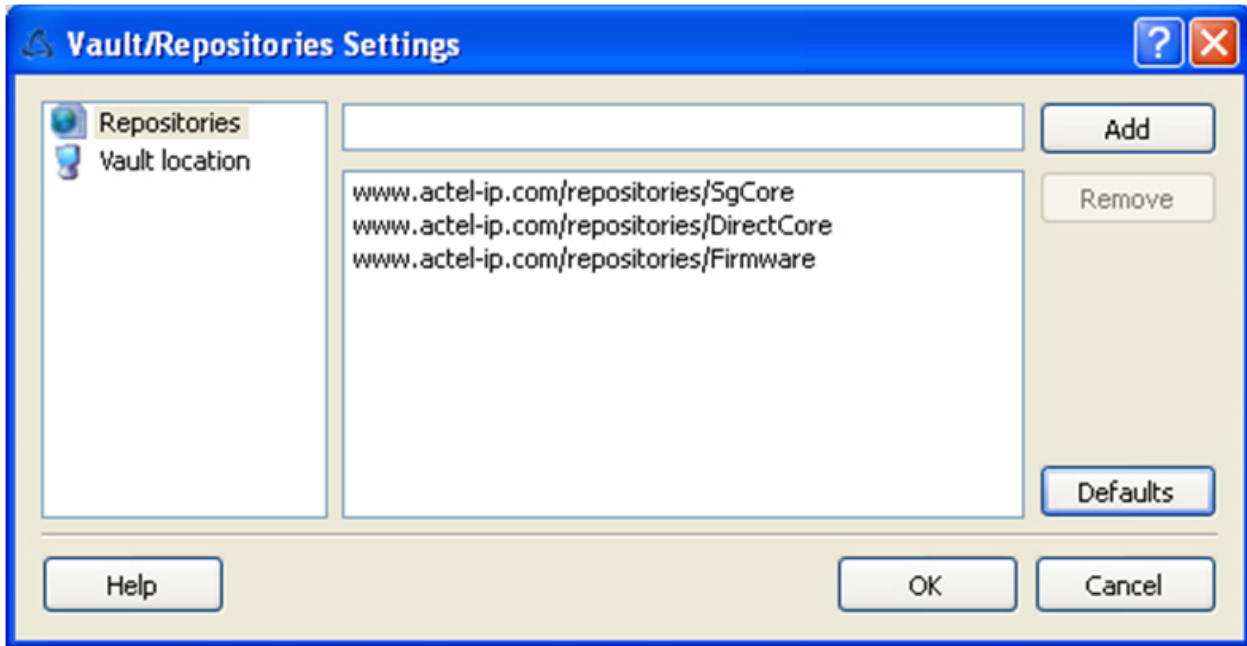


Figure 4: Vault/Repositories Dialog Box

Click **Add** to add a new repository, **Remove** to remove an existing repository, and **Defaults** to restore the Vault/Repositories settings to their default.

Click Vault location to view/change the settings for your vault, as shown in the figure below.

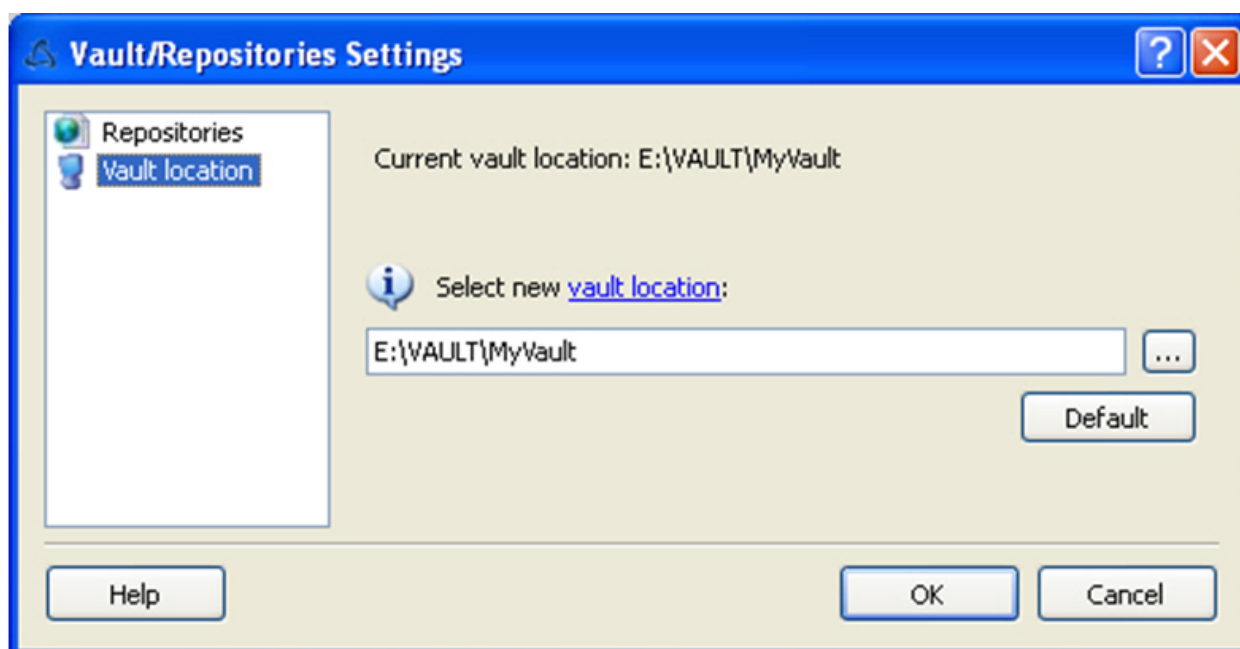


Figure 5: Change Vault Location

Click the Browse button to navigate to a new default Vault location.

Preferences Dialog Box





The Preferences dialog box enables you to set your proxy settings.

Proxy Settings



Use a proxy server / Proxy name – set this option if you use a proxy server to connect to the Internet. Enter your proxy server as required.

SmartDesign MSS Configurator Menus

File Menu

Command	Icon	Shortcut	Function
New		Ctrl+N	Opens the New Project dialog, enables you to create a new project. This option is not available when the SmartDesign MSS Configurator is invoked from Libero.
Open		Ctrl+O	Opens an existing project. This option is not available when the SmartDesign MSS Configurator is invoked from Libero.
Save		Ctrl+S	Saves the current project
Execute Script...			Opens the Execute Script dialog box, enables you to run a Tcl script with any additional arguments and show the script report when it is complete
Export Script File...			Opens the Export Script dialog box; enables you to export a Tcl script for use at a later time
Exit		Ctrl + Q	Quits the SmartDesign MSS Configurator


Edit Menu

Command	Icon	Shortcut	Function
Undo		Ctrl+Z	Undo the last action
Redo		Ctrl+Y	Redo the last undone action

View Menu

Command	Icon	Shortcut	Function
Log			Show the Log Window. To hide the log window, click the "x" icon on the log window pane.

Design Menu

Command	Icon	Shortcut	Function
Show Memory Map / Datasheet			Generates the Memory Map / Datasheet of the Microcontroller Subsystem and opens your default browser to display it.
Generate			Generates the design

Options Menu

Only available when opened in standalone mode.

Command	Icon	Shortcut	Function
Add Core to Vault			Enables you to add a core to your vault using a .CPZ file
Vault / Repositories Settings			Opens the Vault/Repositories Settings dialog box. Use the dialog box to set locations for your vault and add repositories.
Preferences			Opens the Preferences dialog box; enables you to set your Proxy settings

Help Menu

Command	Icon	Shortcut	Function
Help Topics			Opens the Libero online help
SmartFusion Microcontroller Subsystem (MSS)			Help topics that are specific to SmartFusion MSS
Actel Technical Support			Opens the Actel Technical Support web page in your default browser (if you have an active internet connection)
Actel Web Site			Opens the Actel web page (www.actel.com) in your default browser (if you have an active internet connection)
About SmartDesign			Lists your SmartDesign MSS Configurator release information

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