
SmartFusion2 MSS System Services Driver

Release Notes

Version 2.9

Changes since previous version

1. Updated the existing Flash Freeze, fabric Digest Check, IAP and ISP system service to prevent Glitchless Clock Multiplexer Switching Issue by dynamically divides down fclk, pclk0, pclk1 and clk_fic64 to the divided by 32 versions.

Resolved issues in version 2.9

Driver issues are tracked as software action requests (SAR).

SAR #	SAR Resolution
80563	Before issuing Flash Freeze command, if the device is 010/025/050/090/150 device, Cortex-M3 firmware dynamically divides down fclk, pclk0, pclk1 and clk_fic64 to the divided by 32 versions. If the device is 05 device, firmware will load the divisor values in sequenced from the start setting to the divide by 32 setting. If the device is 060 device, then firmware will compare the divisor values of fclk, pclk0, pclk1 and clk_fic64, and if the divisor values are equal to each other, then firmware will send flash freeze command otherwise flash freeze function will return MSS_SYS_CLK_DIVISOR_ERROR error.

Version 2.8

Changes since previous version

1. Updated the existing IAP and ISP system service to prevent corruption of FACC2 register.
2. Added ASSERT statement in Zeroization system service to inform to the user that zeroization is not enabled in hardware design.
3. Added volatile keyword in the “g_request_in_progress” variable definition in mss_comblk.c file.

Resolved issues in version 2.8

Driver issues are tracked as software action requests (SAR).

SAR #	SAR Resolution
71649	The variable “g_request_in_progress” is updated in interrupt service routine, so add volatile keyword in the “g_request_in_progress” variable definition in mss_comblk.c file.
76584	To set standby clock only while performing IAP/ISP - Program and Verify operation. And correct the value written in MSSDDR FACC2 register, while configuring standby clock mux.
74647	Add ASSERT statement in Zeroization system service before waiting for response.

Version 2.7

Changes since previous version

1. Updated the existing SmartFusion2 MSS System Service example project with latest CMSIS and hal v2.3.103
2. Added new SmartFusion2 MSS System Service example project for SoftConsole v4 tool chain.

- Enhanced the existing DRBG system service example project by providing separate handle for all three DRBG instance.

Version 2.6

Changes since previous version

- Updated *asynchronous_event_handler()* function to handle asynchronous message when no application call-back function is registered.
- Updated create/delete User activation code/key code service to release eNVM-1 lock after completing create/delete operation.
- Updated fetch PUF key service to return buffer location where key is copied through function argument pp_key.

Resolved issues in version 2.6

Driver issues are tracked as software action requests (SAR).

SAR #	SAR Resolution
63468	In asynchronous message handler function, add conditional check to determine whether the call back function is registered or not. If registered, then only call the application call back function, otherwise ignore the received message.
64754	In create/delete User activation code/key code function, call get number of enrolled keys function to release eNVM-1 lock before exiting function.

Version 2.5

Changes since previous version

- Updated In-System Programming (ISP) and In-Application Programming (IAP) system service to perform fabric digest check before performing verification operation.

Resolved issues in version 2.5

Driver issues are tracked as software action requests (SAR).

SAR #	SAR Resolution
59911	Perform fabric digest check before performing IAP verification. If fabric digest check is performed before IAP verification, then IAP verification will be successful as RLOCK sensing function is called as a part of fabric digest check.
61596	Perform fabric digest check before performing ISP verification. If fabric digest check is performed before ISP verification, then ISP verification will be successful as RLOCK sensing function is called as a part of fabric digest check.

Version 2.4

Changes since previous version

- Elliptic Curve services
Added ECC system service to perform point addition and point multiplication.
- PUF services
Added PUF services to perform device authentication and key generation.
- Tamper Control service
Added tamper control service to detect various tamper events and also to control the Power ON/OFF to the PUF after every key fetch, key creation or import or get seed.

4. Update Cryptography example project
Added common function to read data from UART terminal.
5. Update system service driver to handle asynchronous messages.
6. Updated the existing digest check service to handle private eNVM factory and user digest check.
7. Secondary Device certificate
Added new system service driver to read secondary device certificate.
8. In-Application Programming
Added In-Application Programming(IAP) system service to provide another field upgrade method of the hardware design programmed in FPGA fabric.
9. Flash Freeze system service
Updated flash freeze example project to handle clock switching while entering and exiting flash freeze.
Removed flash freeze options for eNVM0 and eNVM1.
10. In-System Programming (ISP) system service
Updated In-System Programming example project to handle clock switching while entering and exiting flash freeze.

Resolved issues in version 2.4

Driver issues are tracked as software action requests (SAR).

SAR #	SAR Resolution
55683	New asynchronous message are added in G4X device. System service driver will process asynchronous event and a call-back handle will be called to provide the event OPCODE and associated message to the user.
52834	Digest check service is modified for eNVM issue. Execute the Digest check service for both release and debug mode and check the status. Expected Output - Control should come back to MSS after execution of service and the status should be SUCCESS
43959	Firmware has been modified to handle enabling of 1MHz and 50 MHz RC oscillator using fabric alignment clock controller 2 configuration register before issuing the ISP/IAP command.
59121	Firmware has been updated to handle clock switching issue during ISP programming.
58304	Flash Freeze service is updated only to handle FPGA and MSS PLL power down. Removed eNVM0 and eNVM1 power down options from flash freeze.

Version 2.3

Changes since previous version

1. Programming Services:
Modified the implementation of functions *MSS_SYS_start_isp()* and *isp_sys_completion_handler()* to ensure correct programming of the eNVM for all SmartFusion2 devices.

Resolved issues in version 2.3

Driver issues are tracked as software action requests (SAR).

SAR #	SAR Resolution
57545	eNVM frequency range must be set to its maximum to ensure correct programming of the eNVM as part of In-System Programming.

Version 2.1

Changes since previous version

2. Programming Services
Updated System Controller ISP service to perform the switchover from source clock to this newly configured standby clock once it receives the programming request in order to avoid the need for user to configure the Standby clock for Cortex-M3 during programming.
Modified API of functions *MSS_SYS_start_isp()* and *MSS_COMBLK_send_paged_cmd()* to make use of typedefs for callback/handler function prototypes.
3. Non-deterministic random bit generator
Added function *MSS_SYS_nrbg_reset()* function to facilitate NRBG reset service.
4. Cryptographic Services
Changed assignment of *op_type* to parameter[4] instead of parameter[3] in function *MSS_SYS_CRI_pseudo_puf_challenge()*. Also changed the *MSS_SYS_CRI_pseudo_puf_challenge()* and *MSS_SYS_CRI_key_tree()* function name to *MSS_SYS_challenge_response()* and *MSS_SYS_key_tree()* respectively to maintain naming consistency.
5. Zeroization
The Zeroization system service is not available on M2S050 rev A, rev B and rev C silicon. Zeroization system service is only supported on rev-D silicon. Revision checks are added in *MSS_SYS_zeroize_device()* function to restrict execution of this service only on the silicon revision that supports it.
6. Asynchronous Messages
Updated the COMBLK Rx handler i.e. *handle_rx_okay_irq()* function to provide the capability to the driver to handle asynchronous messages.
7. System service dependence on Silicon version
Some of the system services are available only on Rev-D silicon and not on previous version (Rev-C PP). When executed, this driver will ASSERT the service which is not available on Rev-C PP devices. Below is the list of Services which will result into ASSERT when executed on RevC PP device.
 - Zeroization
 - Check-Digest
 - HMAC cryptographic service.

Resolved issues in version 2.1

Driver issues are tracked as software action requests (SAR).

SAR #	SAR Resolution
47740	The asynchronous event will be processed and a call-back handle will be called to provide the event OPCODE and associated message to the user.
43299	<i>MSS_SYS_CRI_pseudo_puf_challenge</i> function name is changed to <i>MSS_SYS_challenge_response()</i> function and <i>params[3] = op_type</i> statement is corrected to <i>params[4] = op_type</i> .
47523	<i>MSS_SYS_nrbg_reset()</i> function is added to driver to resolve this SAR.
43959	The SysReg setting suggested by Ciaran in SAR 43959 is implemented before starting IAP/ISP service.

Version 2.0

Initial public release.

SmartFusion2 MSS System Services Driver source code SVN revision numbers

The table below lists the SVN revision number of the files making up the SmartFusion2 MSS System Services driver. These revision numbers can be seen at the top of each source file. They can be used to identify the version of driver used in an existing project.

File	SVN revision								
	Version 2.0	Version 2.1	Version 2.3	Version 2.4	Version 2.5	Version 2.6	Version 2.7	Version 2.8	Version 2.9
drivers/ mss_sys_services /mss_sys_services.h	5591	6082	6082	6840	6840	7294	7294	8345	8680
drivers/ mss_sys_services /mss_sys_services.c	5615	6082	6445	6840	6978	7294	7294	8345	8688
drivers/ mss_sys_services /mss_comblk.h	5160	6082	6082	6348	6348	7294	7294	8345	8345
drivers/ mss_sys_services /mss_comblk.c	5615	6082	6082	6389	6389	7178	7178	8345	8345
drivers/mss_sys_services/ mss_comblk_page_handler.h	-	6082	6082	6082	6082	7178	7178	8345	8345