/IPB/20_Software/SCDD Library/LVDC DSP_C

SCDD_IoHw

Software Component Detailed Design

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ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_1	heading	1 **Software Component Design Description**	n/a
SCDD_IoHw_2	heading	1.1 **Introduction**	n/a
SCDD_IoHw_3	information	This document describes the needed requirements for a SWC or BSWM.	n/a
SCDD_IoHw_4	information	This is module is the Software Component Detail Description. It contains each SW component of each SW architecture. It is always structured in: External Interface Internal Design Requirements	n/a

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_5		[2] **Attributes**	
	information		n/a
SCDD_IoHw_6	information	Agreed attributes for SWE.3 (ENG.6)	n/a
SCDD_IoHw_7	information	**Delta_ObjectType:** Showing the type of the Object. Values: - • tbd (default) -> To Be Discussed. • heading -> Object Represent Head for a collection of objects belong to same logical group. • feature • information • requirement	n/a
SCDD_IoHw_8	information	**Delta_SW_Construction_Status:** Showing the status of the implementation. Values: - • tbd (default) -> To Be Discussed. • ready for implementation -> Requirement is ready and can be implemented. • created -> internal design (inclusive design review) and source code is ready (inclusive code review). • finished -> module test (inclusive code review) done. • postponed -> requirement that is not part of the current release.	n/a
	information		n/a

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_9	information	**Delta_ReqStatus:** Showing the Implementation phase of the requirement. Values: - • In work (default) -> Requirement still in implementation phase. • ready for review -> Requirement is implemented and need to be reviewd. • point to clarify -> Requirement need clarifications. • Accepted by project -> Requirement is accepted and ready for implementation. • Discarded by project -> Requirement is rejected and won't implemented. • n/a -> Not Applicable for non requirements objects.	n/a
SCDD_IoHw_10	information	**Delta_FuSa_Relevance:** Showing the ASIL level of requirement.	n/a
SCDD_IoHw_11	information	**Delta_Testability:** Showing if requirement is testable.	n/a
SCDD_IoHw_12	information	**Delta_TestCase:** Showing the Status of test case that cover this requirement. Values: - • tbd(default) -> Requirement still in implementation phase. • Implemented ->Test cases is implemented. • In Progress -> Test cases is still in implementation. • n/a -> Not Applicable for non requirements objects.	n/a

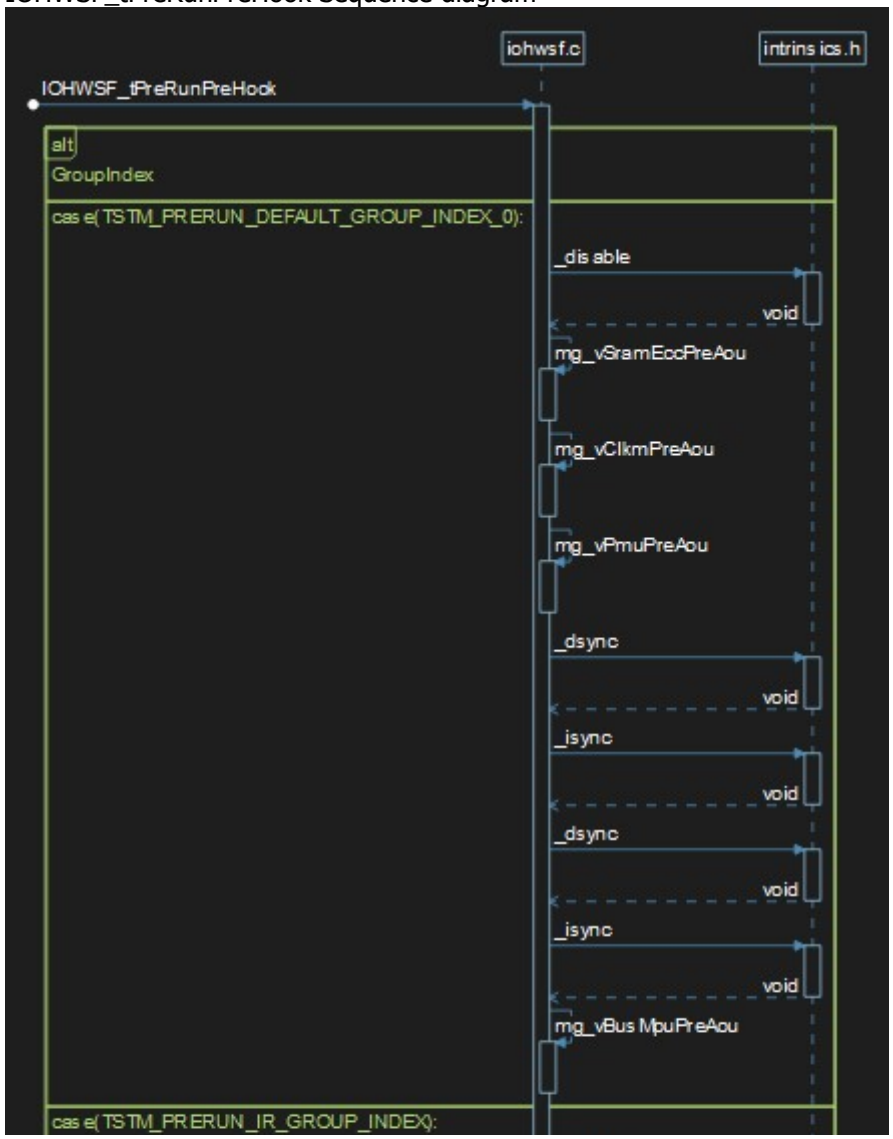
Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_13		3 **Views**	
SCDD_IoHw_14	information	**Review View**: This view is used for SCDD edit and review.	n/a

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_15	heading	4 **iohw**	n/a
SCDD_IoHw_16	information	4.1 **External Interfaces**	n/a
SCDD_IoHw_17		The function interface of this component are as following: IOHWSF_ACCESSPROT_vConfigureAccessProtection IOHWSF_vIsr_Call100us_SourceCheck IOHWSF_vIsr_Call10ms_SourceCheck ISR_DefaultHandler IOHWSF_vCheckRSRCON2_CSS0_Bit IOHWSF_vMcSafeStartUpChecks IOHWSF_vMcSafeSwitchToRunState IOHWSF_vDefaultErrorHandler IOHWSF_tPreRunPreHook IOHWSF_tPreRunPostHook	
SCDD_IoHw_18	heading	4.2 **Internal design**	n/a
SCDD_IoHw_124	information	IOHWSF_vMcSafeStartUpChecks Sequence diagram See Figure 1 on page 35.	Accepted by project
SCDD_IoHw_126	information	IOHWSF_vMcSafeSwitchToRunState Sequence diagram See Figure 2 on page 36.	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
ASIL B		Init	tbd	tbd	
ASIL B		Init	tbd	tbd	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_127	information	IOHWSF_tPreRunPreHook Sequence diagram 	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	tbd	tbd	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_127			project
SCDD_IoHw_128	information	IOHWSF_tPreRunPostHook Sequence diagram See Figure 3 on page 37.	Accepted by project
SCDD_IoHw_19	heading	4.3 **Requirements**	n/a
SCDD_IoHw_20	heading	4.3.1 **ASIL**	n/a
SCDD_IoHw_21	information	The iohw component is ASIL-B level.	n/a
SCDD_IoHw_22	heading	4.3.2 **Data Define**	n/a
SCDD_IoHw_23	information	The C code of this component can be found in following link: https://desoeap16.delta.corp/svn/IPB_PPE_auto_porsche/trunk/20_Design/23_Software/2304_Implementation/10_APPL/40_DcDcController/4010_HSFB_LVDC_B1_MBD/30_Bsw/iohw	n/a
SCDD_IoHw_24	heading	4.3.3 **iohw functions**	n/a
SCDD_IoHw_25	heading	4.3.3.1 **ASIL Functions**	n/a
SCDD_IoHw_26	heading	4.3.3.1.1 **IOHWSF_ACCESSPROT_vConfigureAccessProtection**	n/a
SCDD_IoHw_27	information	**Syntax:** void IOHWSF_ACCESSPROT_vConfigureAccessProtection(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	tbd	tbd	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_27		**Parameters(out):** None **Parameters(inout):** None **Description:** Function to grant the Access for the allowed masters to the functional blocks configuration registers **This function is calling :** mg_vSettingAccessRights mg_vWriteSafetyEndInitProtReg	project
SCDD_IoHw_28	requirement	This function set S bit in CPU_PSW register	Accepted by project
SCDD_IoHw_29	requirement	This function set IS and IT bit in CPU_SYSCON register	Accepted by project
SCDD_IoHw_30	requirement	This function configure bus masters Safe task on CPU0 and Cerberus to have access to safe peripheral through ACCEN register related to each peripheral	Accepted by project
SCDD_IoHw_31	requirement	This function configure bus masters Safe task on CPU0 and Cerberus to have access to Local SRAM through CPU0_SPROT_RGNACCENA/Bx registers	Accepted by project
SCDD_IoHw_32	requirement	This function configure bus masters Safe task on CPU0 and Cerberus to have access to CPU0 SFRs through CPU0_SPROT_ACCENA/B registers	Accepted by project
SCDD_IoHw_33	heading	4.3.3.1.2 **IOHWSF_vIsr_Call100us_SourceCheck**	n/a
SCDD_IoHw_34	information	**Syntax:** void IOHWSF_vIsr_Call100us_SourceCheck(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None	Discarded by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_34		**Parameters(out):** None **Parameters(inout):** None **Description:** Function to check the Isr_Call100us Interrupt source **This function is calling :** IOHWSF_vDefaultErrorHandler	project
SCDD_IoHw_35	requirement	This function check if GTM TOM1 Channel 11 is triggred with CCU0 trigger condition and if not reset should be triggred with IOHWSF_E_ISR_100U_SOURCE_ERR reason	Discarded by project
SCDD_IoHw_36	heading	4.3.3.1.3 **IOHWSF_vIsr_Call10ms_SourceCheck**	n/a
SCDD_IoHw_37	information	**Syntax:** void IOHWSF_vIsr_Call10ms_SourceCheck(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Function to check the Isr_Call10ms Interrupt source **This function is calling :** IOHWSF_vDefaultErrorHandler	Discarded by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_38	requirement	This function check if GTM TOM1 Channel 14 is triggred with CCU0 trigger condition and if not reset should be triggred with IOHWSF_E_ISR_10U_SOURCE_ERR reason	Discarded by project
SCDD_IoHw_39	heading	4.3.3.1.4 **ISR_DefaultHandler**	n/a
SCDD_IoHw_40	information	**Syntax:** void __attribute__ ((interrupt_handler)) ISR_DefaultHandler(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Function to handle all the not used ISRs **This function is calling :** IOHWSF_vDefaultErrorHandler	Accepted by project
SCDD_IoHw_41	requirement	This function trigger reset with reason IOHWSF_E_ISR_UNHANDLED_ISR	Accepted by project
SCDD_IoHw_42	heading	4.3.3.1.5 **IOHWSF_vCheckRSRCON2_CSS0_Bit**	n/a
SCDD_IoHw_43	information	**Syntax:** FUNC(void, iohw_CODE) IOHWSF_vCheckRSRCON2_CSS0_Bit(void) **Synchronization:** Synchronous	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	
ASIL B		Init	testable	tbd	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_43		**Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Function to Check the RSTCON2.CSS0 (Safe State Reached) before start the safety application **This function is calling :** IOHWSF_vDefaultErrorHandler	project
SCDD_IoHw_44	requirement	This function check over CSS0 bit in SCU_RSTCON2 register and if cleared will reset with reason IOHWSF_E_CORE0_NOT_IN_SAFE_STATE	Accepted by project
SCDD_IoHw_45	heading	4.3.3.1.6 **IOHWSF_vMcSafeStartUpChecks**	n/a
SCDD_IoHw_46	information	**Syntax:** void IOHWSF_vMcSafeStartUpChecks(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_46		**Description:** Initialize TstM module and use it execute all SafeTlib Pre Run Phase Test groups **This function is calling :** _disable Sl_ChkProgErrorPattern IOHWSF_vDefaultErrorHandler TstM_Init TstM_InvalidateData TstM_PreRunTst	project
SCDD_IoHw_47	requirement	This function disable interrupts before calling any further functions	Accepted by project
SCDD_IoHw_48	requirement	This function call SafetLib Sl_ChkProgErrorPattern function and check over its result and if failed then trigger reset with reason IOHWSF_E_FLASH_TEST_PATTERN_NOT_FLSHED	Accepted by project
SCDD_IoHw_49	requirement	This function initialize TstM moudle, invalidate its data and call SafetLib pre run test groups TSTM_PRERUN_DEFAULT_GROUP_INDEX_0, TSTM_PRERUN_DEFAULT_GROUP_INDEX_1, TSTM_PRERUN_IR_GROUP_INDEX and TSTM_PRERUN_LOCKSTEP_GROUP_INDEX	Accepted by project
SCDD_IoHw_50	heading	4.3.3.1.7 **IOHWSF_vMcSafeSwitchToRunState**	n/a
SCDD_IoHw_51	information	**Syntax:** void IOHWSF_vMcSafeSwitchToRunState(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	tbd	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_51		**Description:** Setup SMU FSP pin, configure SMU with runtime configuration and lock SMU configuration, Switch SafeTlib to run phase, execute SafeTlib runtime test groups, enable SMU NMI trap and, disable interrupts **This function is calling :** Smu_SetupErrorPin IOHWSF_vDefaultErrorHandler Sl_SwitchTstPhase TstM_Run mg_getCpuWatchdogPasswordInline mg_clearCpuEndinitInline mg_setCpuEndinitInline IOHWSF_vCheckRSRCON2_CSS0_Bit _disable	project
SCDD_IoHw_52	requirement	This function configure pin 8 in port c to be a push pull output pin	Accepted by project
SCDD_IoHw_53	requirement	This function call Smu_SetupErrorPin and check over its result if fail then trigger reset with reason IOHWSF_E_SETUP_FSP_PIN	Accepted by project
SCDD_IoHw_54	requirement	This function call Sl_SwitchTstPhase to switch TstHandler module to Run phase and check over its result if fail then trigger reset with reason IOHWSF_E_SMU_LOCK_CFG_TST and if passed call TstM_Run()	Accepted by project
SCDD_IoHw_55	requirement	This function call Sl_SwitchTstPhase to switch TstHandler module to Run phase and check over its result if fail then trigger reset with reason IOHWSF_E_SMU_LOCK_CFG_TST	Accepted by project
SCDD_IoHw_56	requirement	This function enable TRAP request for SMU through clearing SMUT bit in TRAPDIS register	Accepted by project
SCDD_IoHw_129	requirement	This function calls IOHWSF_vCheckRSRCON2_CSS0_Bit() to check whether the CPU(s) reached a stable state before reset	Accepted by project
SCDD_IoHw_57	requirement	This function disable all interrupts at end of its execution	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_58	heading	4.3.3.1.8 **IOHWSF_vDefaultErrorHandler**	n/a
SCDD_IoHw_59	information	**Syntax:** void IOHWSF_vDefaultErrorHandler(IOHWSF_E_ErrorType eError) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Start system reset throug SW reset request operation **This function is calling :** mg_vMcu_PerformReset	Accepted by project
SCDD_IoHw_60	heading	4.3.3.1.9 **IOHWSF_tPreRunPreHook**	n/a
SCDD_IoHw_61	information	**Syntax:** Std_ReturnType __attribute__ ((noinline)) IOHWSF_tPreRunPreHook (uint8 GroupIndex) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** GroupIndex: Configured Index of TstHandler Test Group **Parameters(out):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_61		**Parameters(inout):** None **Description:** Depending on GroupIndex, ensure AOU of SafeTlib tests mapped to test group, and if needed buffer any data or status changed during SafeTlib tests executions **This function is calling :** _disable mg_vSramEccPreAou mg_vClkmPreAou mg_vPmuPreAou MTCR mg_vBusMpuPreAou _enable mg_vPhlSramPreAou	project
SCDD_IoHw_62	requirement	In case executing TSTM_PRERUN_DEFAULT_GROUP_INDEX_0, TSTM_PRERUN_DEFAULT_GROUP_INDEX_1, and TSTM_PRERUN_LOCKSTEP_GROUP_INDEX SafetLib test groups this function disable all interrupts	Accepted by project
SCDD_IoHw_63	requirement	In case executing TSTM_PRERUN_IR_GROUP_INDEX SafetLib test group this function enable all interrupts	Accepted by project
SCDD_IoHw_64	requirement	In case executing TSTM_PRERUN_DEFAULT_GROUP_INDEX_0 SafetLib test group this function clear the first 8 byte in PSPR memory	Accepted by project
SCDD_IoHw_65	requirement	In case executing TSTM_PRERUN_DEFAULT_GROUP_INDEX_0 SafetLib test group this function clear CPU_DSTR and CPU_DATR registers	Accepted by project
SCDD_IoHw_66	heading	4.3.3.1.10 **IOHWSF_tPreRunPostHook**	n/a
SCDD_IoHw_67	information	**Syntax:** Std_ReturnType __attribute__ ((noinline)) IOHWSF_tPreRunPostHook (uint8 GroupIndex) **Synchronization:** Synchronous	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_67		**Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Depending on GroupIndex, ensure AOU of SafeTlib tests mapped to test group, and if needed restore any data or status changed during SafeTlib tests executions **This function is calling :** _disable mg_vSramEccPostAou mg_vBusMpuPostAou mg_vPhlSramPostAou	project
SCDD_IoHw_68	requirement	This function disable all interrupts at beginning of its execution	Accepted by project
SCDD_IoHw_69	heading	4.3.3.1.11 **mg_getSafetyWatchdogPassword**	n/a
SCDD_IoHw_70	information	**Syntax:** static inline uint16 mg_getSafetyWatchdogPassword(void) **Synchronization:** Synchronous **Reentrancy:** Reentrant **Return:** Currently installed password **Parameters(in):** None **Parameters(out):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_70		**Parameters(inout):** None **Description:** Rretrieve the endinit password currently installed in the safety watchdog **This function is calling :** None	project
SCDD_IoHw_71	heading	4.3.3.1.12 **mg_clearSafetyEndinit**	n/a
SCDD_IoHw_72	information	**Syntax:** static inline void mg_clearSafetyEndinit(uint16 password) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** password - Should be equal to installed password in the safety watchdog **Parameters(out):** None **Parameters(inout):** None **Description:** This API will disable ENDINIT functionality provided by Safety WDT Hardware module. User need to use this API call before modifying any safety ENDINIT protected register. **This function is calling :** None	Accepted by project
SCDD_IoHw_73	heading	4.3.3.1.13 **mg_setSafetyEndinit**	n/a

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	
n/a		n/a	n/a	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_74	information	**Syntax:** static inline void mg_setfetyEndinit(uint16 password) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** password - Should be equal to installed password in the safety watchdog **Parameters(out):** None **Parameters(inout):** None **Description:** This API will enable ENDINIT functionality provided by Safety WDT Hardware module. User need to use this API call after modifying any safety ENDINIT protected register. **This function is calling :** None	Accepted by project
SCDD_IoHw_75	heading	4.3.3.1.14 **mg_vWriteSafetyEndInitProtReg**	n/a
SCDD_IoHw_76	information	**Syntax:** static inline void mg_vWriteSafetyEndInitProtReg(volatile uint32 * pu32Register, uint32 u32Data) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** pu32Register -Eendinit protected register address **Parameters(in):** u32Data - Value to be written to the register **Parameters(out):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		n/a	not testable	n.a	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_76		**Parameters(inout):** None **Description:** This function clear safety endinit protection, write data to safety endinit protected register then set safety endinit protection again. **This function is calling :** mg_getSafetyWatchdogPassword mg_clearSafetyEndinit mg_setSafetyEndinit	project
SCDD_IoHw_77	heading	4.3.3.1.15 **mg_vSettingAccessRights**	n/a
SCDD_IoHw_78	information	**Syntax:** static inline void __attribute__((__always_inline__)) mg_vSettingAccessRights(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** This function set S bit (Safety Task Identifier) in PSW core register to mark caller function as safe task, also set IS and IT bits in SYSCON core register to set S bit when trap or interrupt occur **This function is calling :** __mfcr __isync mg_getSafetyWatchdogPassword	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_78		mg_clearSafetyEndinit __mtcr mg_setSafetyEndinit	project
SCDD_IoHw_79	heading	4.3.3.1.16 **mg_getCpuWatchdogPasswordInline**	n/a
SCDD_IoHw_80	information	**Syntax: static inline uint16 mg_getCpuWatchdogPasswordInline(Ifx_SCU_WDTCPU *watchdog)** **Synchronization: Synchronous** **Reentrancy: Reentrant** **Return: Currently installed password** **Parameters(in): watchdog - Start address CPU watchdog registers block** **Parameters(out): None** **Parameters(inout): None** **Description: Rretrieve the endinit password currently installed in the CPU watchdog** **This function is calling : None**	Accepted by project
SCDD_IoHw_81	heading	4.3.3.1.17 **mg_clearCpuEndinitInline**	n/a
SCDD_IoHw_82	information	**Syntax:** static inline void mg_clearCpuEndinitInline(Ifx_SCU_WDTCPU *watchdog, uint16 password) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_82		**Return:** None **Parameters(in):** watchdog - Start address CPU watchdog registers block **Parameters(in):** password - Should be equal to installed password in the CPU watchdog **Parameters(out):** None **Parameters(inout):** None **Description:** This API will disable ENDINIT functionality provided by CPU WDT Hardware module. User need to use this API call before modifying any CPU ENDINIT protected register. **This function is calling :** None	project
SCDD_IoHw_83	heading	4.3.3.1.18 **mg_setCpuEndinitInline**	n/a
SCDD_IoHw_84	information	**Syntax:** static inline void mg_setCpuEndinitInline(Ifx_SCU_WDTCPU *watchdog, uint16 password) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** watchdog - Start address CPU watchdog registers block **Parameters(in):** password - Should be equal to installed password in the CPU watchdog **Parameters(out):** None **Parameters(inout):** None **Description:** This API will enable ENDINIT functionality provided by CPU WDT Hardware module.	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_84		User need to use this API call after modifying any CPU ENDINIT protected register. **This function is calling :** None	project
SCDD_IoHw_85	heading	4.3.3.1.19 **mg_setProgramCache**	n/a
SCDD_IoHw_86	information	**Syntax:** static inline void mg_setProgramCache(boolean enable) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** enable - Program cache will be enable if true, and disabled otherwise **Parameters(out):** None **Parameters(inout):** None **Description:** Enable/Disable program cache, and nitiate invalidation of current cache contents before enabling it **This function is calling :** mg_getCpuWatchdogPasswordInline mg_clearCpuEndinitInline mg_setCpuEndinitInline __isync	Accepted by project
SCDD_IoHw_87	heading	4.3.3.1.20 **mg_setDataCache**	n/a
SCDD_IoHw_88	information	**Syntax:** static inline void mg_setDataCache(boolean enable) **Synchronization:** Synchronous	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_88		**Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** enable - Data cache will be enable if true, and disabled otherwise **Parameters(out):** None **Parameters(inout):** None **Description:** Enable/Disable data cache, and nitiate invalidation of current cache contents before enabling it **This function is calling :** mg_getCpuWatchdogPasswordInline mg_clearCpuEndinitInline mg_setCpuEndinitInline __isync	project
SCDD_IoHw_89	heading	4.3.3.1.21 **mg_vMcu_PerformReset**	n/a
SCDD_IoHw_90	information	**Syntax:** static void mg_vMcu_PerformReset(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_90		**Description:** Trigger System Reset By setting the SW bits in the RSTCON Register to 0x01 and loop idly till reset happen **This function is calling :** mg_getSafetyWatchdogPassword mg_clearSafetyEndinit mg_setSafetyEndinit NOP	project
SCDD_IoHw_91	heading	4.3.3.1.22 **mg_vSramEccPreAou**	n/a
SCDD_IoHw_92	information	**Syntax:** static void mg_vSramEccPreAou(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of SafeTlib SRAM ECC Test to be executed before executing SramEccTst_SramEccTst function **This function is calling :** mg_getCpuWatchdogPasswordInline mg_clearCpuEndinitInline mg_vMcu_PerformReset mg_setCpuEndinitInline	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_92		mg_getSafetyWatchdogPassword mg_clearSafetyEndinit mg_setSafetyEndinit	project
SCDD_IoHw_93	requirement	This function enable MTU clock before execute SafeTlib SRAM ECC Test and wait to to take effect, if MTU clock not enabled before timeout then function should trigger reset.	Accepted by project
SCDD_IoHw_94	requirement	This function set PTAG and DSPR memories bits in MTU_MEMTEST0 register to access MC14 _ECCD and MC17_ECCD related registers and enable error notifications and report to SMU alarms.	Accepted by project
SCDD_IoHw_95	requirement	Autoinitialize PTAG memory after toggle enable bit in MTU_MEMTEST0	Accepted by project
SCDD_IoHw_96	heading	4.3.3.1.23 **mg_vSramEccPostAou**	n/a

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	tbd	
n/a		n/a	n/a	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_97	information	**Syntax:** static void mg_vSramEccPostAou(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of SafeTlib SRAM ECC Test to be executed after executing SramEccTst_SramEccTst function **This function is calling :** mg_setProgramCache mg_setDataCache	Accepted by project
SCDD_IoHw_98	requirement	This function enable Program and Data cache after execution of SafetLib SRAM ECC test.	Accepted by project
SCDD_IoHw_99	heading	4.3.3.1.24 **mg_vClkmPreAou**	n/a
SCDD_IoHw_100	information	**Syntax:** static void mg_vClkmPreAou(void) **Synchronization:** Synchronous **Reentrancy:** Reentrant **Return:** None **Parameters(in):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		n/a	not testable	n.a	
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_100		**Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of SafeTlib Clock Monitor Test to be executed before executing ClkmTst_ClkmTst function **This function is calling :** Smu_ClearAlarmStatus	project
SCDD_IoHw_101	requirement	This function clear SMU alarms status related to clock monitoring before execution of SafetLib Clock Monitor Test	Accepted by project
SCDD_IoHw_102	heading	4.3.3.1.25 **mg_vPmuPreAou**	n/a

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_103	information	**Syntax:** static void mg_vPmuPreAou(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of PMU ECC and EDC Test to be executed before executing PmuEccEdcTst_EccEdcTst function **This function is calling :** mg_getCpuWatchdogPasswordInline mg_clearCpuEndinitInline mg_setCpuEndinitInline	Accepted by project
SCDD_IoHw_104	requirement	This function enable safety-ECC mode by writing FCON.NSAFECC register with reset value 0 before execution of SafetLib PMU ECC and EDC Test	Accepted by project
SCDD_IoHw_105	information	4.3.3.1.26 **mg_vBusMpuPreAou**	n/a
SCDD_IoHw_106	information	**Syntax:** static inline void __attribute__((__always_inline__)) mg_vBusMpuPreAou(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant **Return:** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		n/a	not testable	n.a	
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_106		**Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of SafeTlib CPU Bus MPU Test to be executed before executing CpuBusMpuLfmTst_LfmTest function **This function is calling :** MTCR Smu_ClearAlarmStatus MFCR	project
SCDD_IoHw_107	requirement	This function clear IED bit in CPU_PIETR register before execution of SafetLib PMU ECC and EDC Test	Accepted by project
SCDD_IoHw_108	requirement	This function clear SMU alarm of BUS MPU before execution of SafetLib PMU ECC and EDC Test	Accepted by project
SCDD_IoHw_109	requirement	This function store value of S bit in PSW register then clear it before execution of SafetLib PMU ECC and EDC Test	Accepted by project
SCDD_IoHw_110	information	4.3.3.1.27 **mg_vBusMpuPostAou**	n/a
SCDD_IoHw_111	information	**Syntax:** static inline void __attribute__((__always_inline__)) mg_vBusMpuPostAou(void) **Synchronization:** Synchronous **Reentrancy:** Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	Implemented	
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_111		**Parameters(inout):** None **Description:** Implement Assumption of use of SafeTlib CPU Bus MPU Test to be executed after executing CpuBusMpuLfmTst_LfmTest function **This function is calling :** MFCR	project
SCDD_IoHw_112	requirement	This function restore value of S bit to PSW stored before execution of SafetLib PMU ECC and EDC Test	Accepted by project
SCDD_IoHw_113	information	4.3.3.1.28 **mg_vPhlSramPreAou**	n/a
SCDD_IoHw_114	information	**Syntax:** static void mg_vPhlSramPreAou(void) **Synchronization:** Synchronous **Reentrancy:** Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of SafeTlib Peripheral SRAM Test to be executed before executing PhlSramTst_PhlSramTst function **This function is calling:** None	Discarded by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_115	requirement	This function store value of CAN divider and set it to value bigger than 0 before execution of SafetLib Peripheral SRAM Test.	Discarded by project
SCDD_IoHw_116	information	4.3.3.1.29 **mg_vPhlSramPostAou**	n/a
SCDD_IoHw_117	information	**Syntax:** static void mg_vPhlSramPostAou(void) **Synchronization:** Synchronous **Reentrancy:** Reentrant **Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of SafeTlib Peripheral SRAM Test to be executed after executing PhlSramTst_PhlSramTst function **This function is calling :** None	Discarded by project
SCDD_IoHw_118	requirement	This function restore value of CAN divider stored before execution of SafetLib Peripheral SRAM Test.	Discarded by project
SCDD_IoHw_132	information	4.3.3.1.30 **mg_vVlmPreAou**	n/a
SCDD_IoHw_133	information	**Syntax:** static void mg_vVlmPreAou(void) **Synchronization:** Synchronous **Reentrancy:** Non-Reentrant	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	
ASIL B		Init	testable	Implemented	
n/a		n/a	n/a	n.a	
ASIL B		n/a	not testable	n.a	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_133		**Return:** None **Parameters(in):** None **Parameters(out):** None **Parameters(inout):** None **Description:** Implement Assumption of use of Voltage monitoring Test to be executed before executing VltmTst_VltmTst function **This function is calling :** mg_getSafetyWatchdogPassword mg_clearSafetyEndinit mg_setSafetyEndinit	project
SCDD_IoHw_134	requirement	This function configures the voltage thresholds in registers EVROVMON and EVRUVMON before the execution of Safetlib Voltage monitor test	Accepted by project
SCDD_IoHw_136	information	4.3.3.1.31 **IOHWSF_FSPTEST**	n/a
SCDD_IoHw_151	information	IOHWSF_FSPTEST(void) Synchronization: Synchronous Reentrancy: Non-Reentrant Return: None Parameters(in): None Parameters(out): None	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
n/a		n/a	n/a	n.a	
ASIL B		n/a	tbd	tbd	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_151		Parameters(inout): None Description: Implement The Fsp signal test. This function is calling : Qspi_SBC_TxRxData Qspi_SBC_Unlock Qspi_SBC_Lockup IOHWSF_vDefaultErrorHandler Smu_SetAlarmStatus Smu_ClearAlarmStatus Smu_ReleaseFSP Smu_GetSmuState	project
SCDD_IoHw_150	requirement	The function backups the TLF configuration before the start of the test by Reading the configuration status Register of the TLF (RSYSPCFG1) using Qspi_SBC_TxRxData using the command R_RSYSPCFG1 and store it in the local variable u16SysconFigBackupData. Note: The transferred Data consists of 16 bit defined as : Bit0 : Parity Bit1-Bit8 : Data Bit9-Bit14 : Address Bit15 : R/W --> Read = 0 , Write = 1. Extraxt the 8 bit data from the recieved data. Assign the register address to the backedup data to make u16SysconFigBackupData a valid command to the restoration.	Accepted by project
SCDD_IoHw_149	requirement	The function Clears all System status flags in the TLF by writting 1 to all SYSSF register feilds by sending the command W_SYSSF_FF To the TLF.	Accepted by project
SCDD_IoHw_148	requirement	The function Unlocks the write access of the TLF protected registers by calling the function Qspi_SBC_Unlock.	Accepted by project
SCDD_IoHw_147	requirement	The function Requests to enable Err pins monitoring by writing the value 0x0F in the configuration register SYSPCFG1 using the command W_SYSPCFG1_0F	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	

ID	Delta_ObjectType	Software Component Detailed Design	Delta_ReqStatus
SCDD_IoHw_146	requirement	The function locks the write access of the TLF protected registers by calling the function Qspi_SBC_Lockup.	Accepted by project
SCDD_IoHw_145	requirement	The function Triggers alarm: ALM5[0] using the function Smu_SetAlarmStatus and Keep reading the SYSSF flags till ERRMISS feild is set or the response time reached 100us.	Accepted by project
SCDD_IoHw_144	requirement	The function checks the TimeOut doesn't reach the covery time 100us ,100us is represented by 64 loop So the function checks a counter that doesn't reach 64. And if the maximum time reached request reset.	Accepted by project
SCDD_IoHw_143	requirement	The function Clears alarm : ALM5[0] using the function Smu_ClearAlarmStatus and Return the SMU state to the RUN state using the function Smu_ReleaseFSP. And make sure that its return to run state. And if it doesn't go to the run state and kept in the fault state , a reset will occured.	Accepted by project
SCDD_IoHw_142	requirement	The function unlocks the write access of the TLF protected registers and Restores The TLF configuration by updating the register SYSPCFG1 using the command u16SysconFigBackupData. Then locks the write access of the TLF protected registers.	Accepted by project
SCDD_IoHw_141	requirement	The function Clears all System status flags in the TLF by writting 1 to all SYSSF register feilds by sending the command W_SYSSF_FF To the TLF.	Accepted by project
SCDD_IoHw_140	requirement	The function calls back all written registers to make sure that they are updated successfully ,a reset will occured if any register doesn't updated successfully.	Accepted by project

Delta_FuSa_Relevance	Delta_InternalComment	Delta_TestLevel_SCDD	Delta_Testability	Delta_TestCase	Delta_CommentTesting
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	
ASIL B		Init	testable	tbd	

Figure 1: From object 124 on page 5.

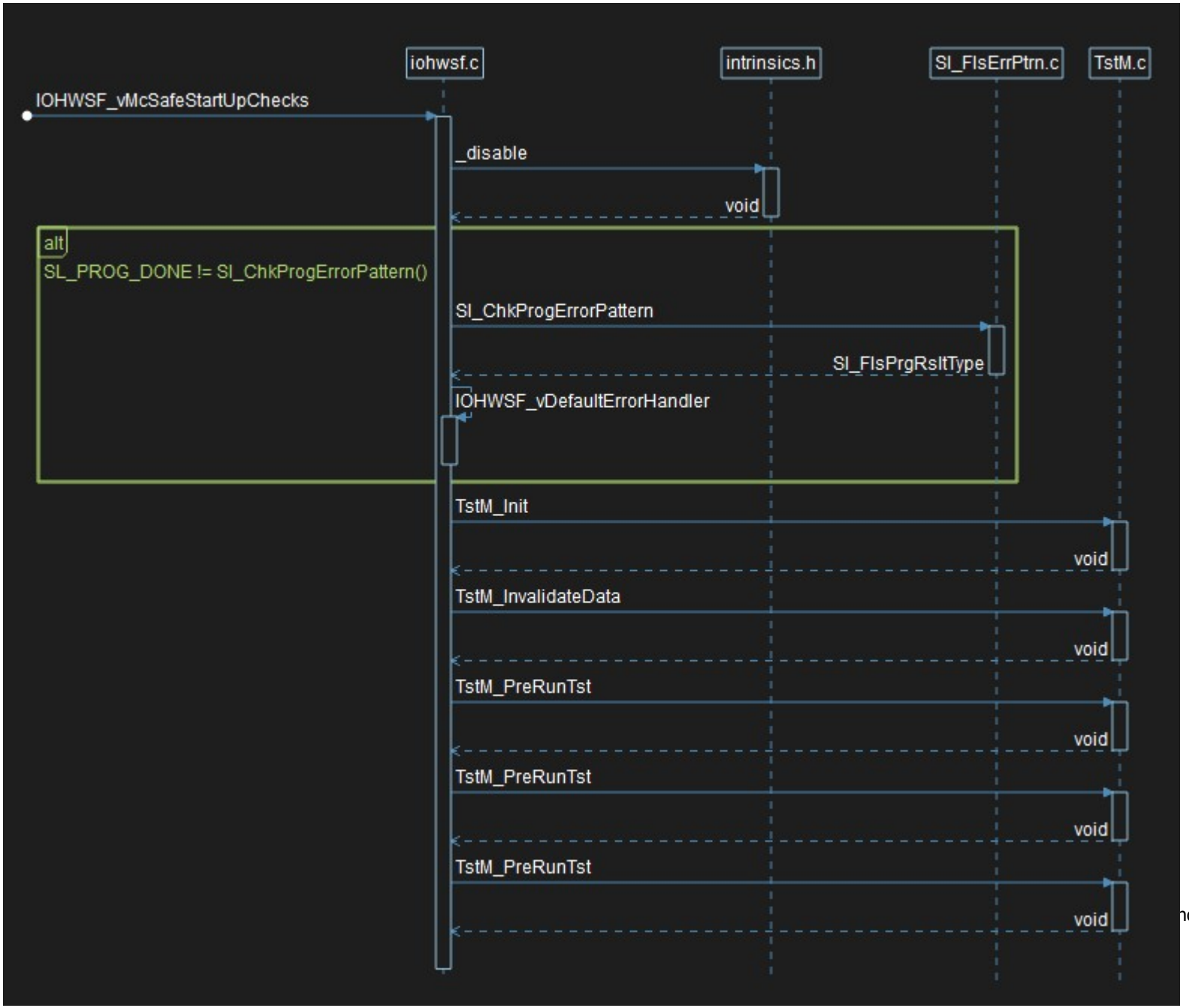


Figure 2: From object 126 on page 5.

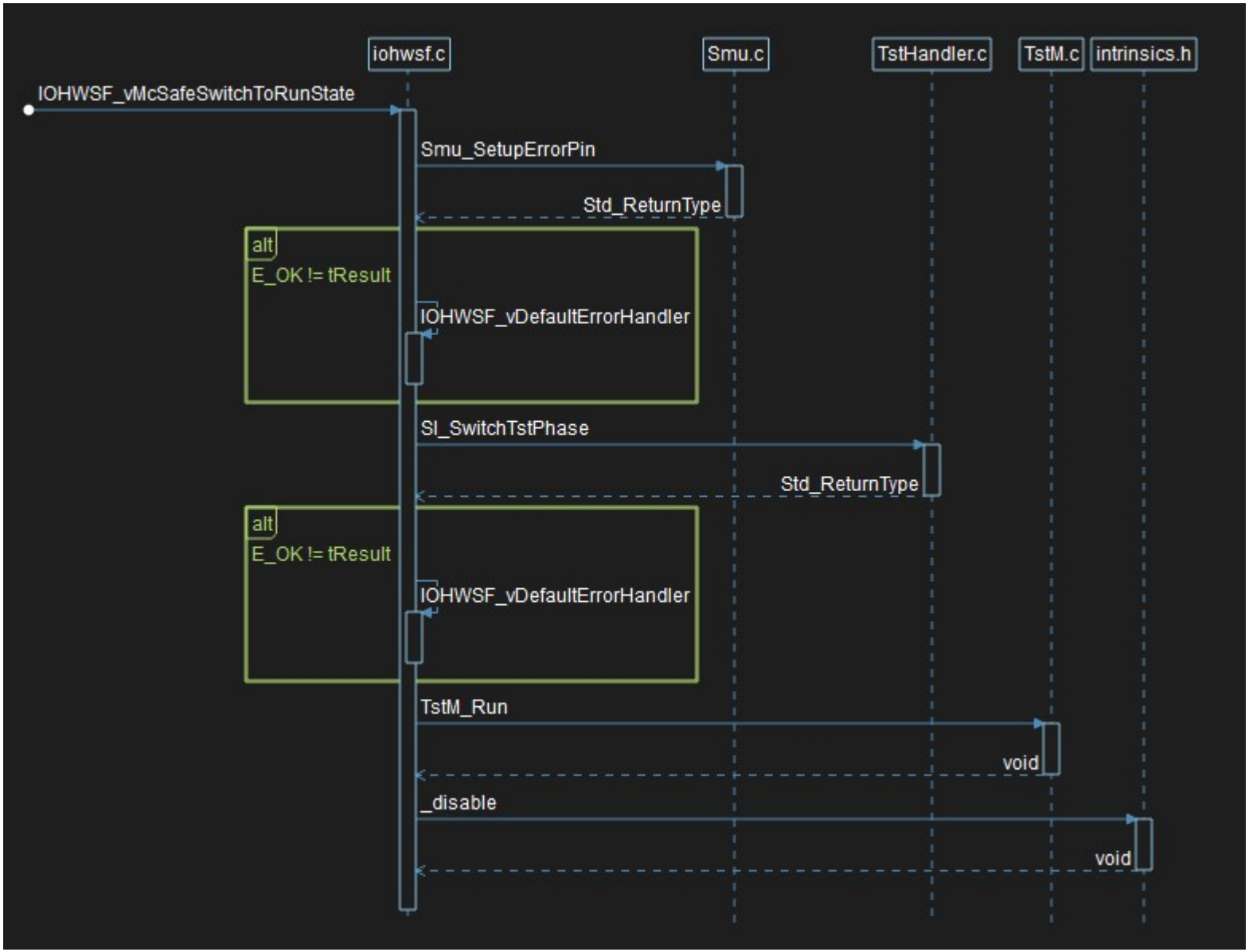


Figure 3: From object 128 on page 6.