User's Manual

# AUTOSAR MCAL R4.0.3
## User's Manual

SPI Driver Component Ver.1.0.7

Generation Tool User's Manual

Target Device:
RH850/P1x



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## Abbreviations and Acronyms

| Abbreviation / Acronym | Description |
|---|---|
| AUTOSAR | AUTomotive Open System ARchitecture |
| BSWMDT | Basic Software Module Description Template |
| CSIH | Enhanced Queued Clocked Serial Interface. |
| DEM | Diagnostic Event Manager |
| EB | External Buffer |
| ECU | Electronic Control Unit |
| e.g | Example |
| Hz | Hertz |
| HW | Hardware |
| IB | Internal Buffer |
| Id | Identifier |
| MCAL | MicroController Abstraction Layer |
| MCU | Micro Controller Unit |
| PCLK | Peripheral Clock |
| Rx | Receive |
| SPI | Serial Peripheral Interface |
| Tx | Transmit |
| XML | eXtensible Mark-up Language |

## Definitions

| Terminology | Description |
|---|---|
| BSWMDT File | This file is the template for the Basic Software Module Description. |
| Configuration XML File | This file contains the setting of command line options. |
| ECU Configuration Description File | Input file to SPI Driver Generation Tool. It is generated by ECU Configuration Editor. |
| Sl.No | Serial Number. |
| Translation XML File | This file contains the translation and device specific header file path. |

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# Chapter 1 Introduction

The SPI Driver component provides the service for initializing the whole SPI structure of the microcontroller.

The SPI Driver Component comprises of two sections as Embedded Software and the Generation Tool to achieve scalability and configurability.

The document describes the features of the SPI Driver Generation Tool. SPI Driver Generation Tool is a command line tool that extracts information from ECU Configuration Description File and generates SPI Driver C Source and C Header files (Spi_Cfg.h, Spi_Cbk.h, Spi_PBcfg.c and Spi_Lcfg.c).

This document contains information on the options, input and output files of the SPI Driver Generation Tool. In addition, this manual covers a step-by-step procedure for the usage of tool.

ECU Configuration Description File contains information about SPI configuration.

## 1.1 Document Overview

This user manual is organized as given in the table below:

| Section | Contents |
|---|---|
| Section 1 (Introduction) | Provides an introduction to the document and explains how information is organized in this manual. |
| Section 2 (Reference) | Provides a list of documents referred while developing this document. |
| Section 3 (SPI Driver Generation Tool Overview) | Provides the component overview of SPI Driver. |
| Section 4 (Input Files) | Provides information about ECU Configuration Description File. |
| Section 5 (Output Files) | Explains the output files that are generated by the SPI Driver Generation Tool. |
| Section 6 (Precautions) | Contains precautions to be taken during configuration of ECU Configuration Description File. |
| Section 7 (User Configuration Validation) | Describes about user configuration validation done by the SPI Driver Generation Tool. |
| Section 8 (Messages) | Describes all the Error/Warning/Information messages of R4.0.3 which helps the user to understand the probable reason for the same. |
| Section 9 (Notes) | Provides notes to help the user to understand this document better. |

# Chapter 2 Reference

## 2.1 Reference Documents

The following table lists the documents referred to develop this document:

| Sl.No. | Title | Version |
|---|---|---|
| 1. | AUTOSAR_SWS_SPIHandlerDriver.pdf | 3.2.0 |
| 2. | **P1M Parameter Definition File**<br><br>R403_SPI_P1M_04_05_12_13_20_21.arxml | 1.0.5 |
| 3. | **P1M Parameter Definition File**<br><br>R403_SPI_P1M_10_11_14_15_18_19_22_23.arxml | 1.0.5 |

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# Chapter 3 SPI Driver Generation Tool Overview

SPI Driver Generation Tool overview is shown below.

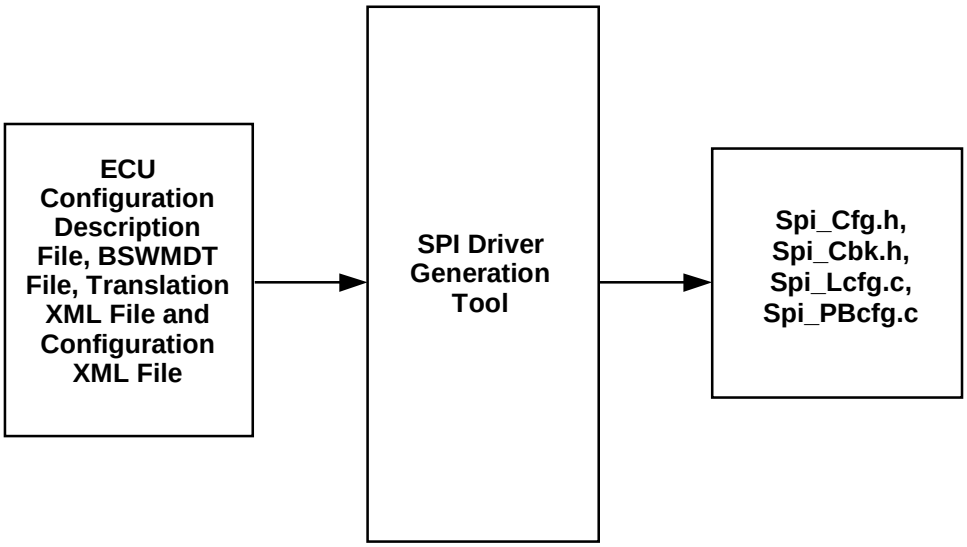


**Figure 3-1 Overview of SPI Driver Generation Tool**

SPI Driver Generation Tool is a command line tool that extracts, analyzes the configuration details provided in the input file and validates correctness of the data and provides scalability and configurability for SPI Driver module. It accepts ECU Configuration Description File(s), BSWMDT File, Translation XML File and Configuration XML File as input and displays appropriate context sensitive error messages for wrong input and exits. Tool creates the Log file Spi.log that contains the list of Error/Warning/Information messages in the output directory.

For the error free input file, the tool generates the following output files: Spi_Lcfg.c, Spi_PBcfg.c, Spi_Cfg.h and Spi_Cbk.h.

Spi_Cfg.h and Spi_Cbk.h will be compiled and linked with SPI Driver Component. Spi_Lcfg.c and Spi_PBcfg.c will be compiled and linked separately from the other C Source files and placed in flash.

ECU Configuration Description File can be created or edited using ECU Configuration Editor.

**Remark**

- In case of errors the generation tool returns a 1, in case of no errors the generation tool returns a 0.
- SPI Driver Generation Tool uses “Common Published Information” from SPI module specific BSWMDT File. SPI module specific BSWMDT File should not be updated manually since it is ”Static Configuration” file.

# Chapter 4 Input Files

SPI Driver Generation Tool accepts ECU Configuration Description File(s), BSWMDT File, Translation XML File and Configuration XML File as input. SPI Driver Generation Tool needs information about SPI Driver module. Hence ECU Configuration Description File should contain configuration of SPI Driver module. Generation Tool ignores any other AUTOSAR component configured in the ECU Configuration Description File. ECU Configuration Description File can be generated using configuration editor.

ECU Configuration Description File must comply with AUTOSAR standard ECU Configuration Description File format

**Remark** The detailed explanation about the parameters and containers are found in P1x Parameter Definition File referred in Reference Documents section.

# Chapter 5 Output Files

SPI Driver Generation Tool generates configuration details in C Header and C Source files (Spi_Lcfg.c, Spi_PBcfg.c, Spi_Cbk.h and Spi_Cfg.h).

The content of each output file is given in the table below:

**Table 5-1 Output Files Description**

| Output File | Details |
|---|---|
| Spi_Cfg.h | This file contains pre-compile time parameters and handles. |
| Spi_Cbk.h | This file contains callback function prototype declarations to be used by application. |
| Spi_PBcfg.c | This file contains post-build time parameters. |
| Spi_Lcfg.c | This file contains structures of link time parameters. |

**Remark** Output files generated by SPI Driver Generation Tool should not be modified or edited manually.

# Chapter 6 Precautions

- ECU Configuration Description File and BSWMDT File must comply with AUTOSAR standard for R4.0.3 ECU Configuration Description File and BSWMDT File respectively.
- The input file must contain SPI Driver module.
- Default Translation XML File (Spi_X1x.trxml) should be present in same location of Spi_X1x.exe when the variant specific trxml file is not given as input in command line.
- Default Configuration XML File (Spi_X1x.cfgxml) must be present in same location of Spi_X1x.exe.
- If Translation XML File is not provided on the command line, Spi_X1x.trxml which is present in same location of Spi_X1x.exe is considered as ‘default’ Translation XML File.
- If Configuration XML File is not provided on the command line, Spi_X1x.cfgxml which is present in same location of Spi_X1x.exe is considered as ‘default’ Configuration XML File.
- Translation XML File should contain the file extension ‘.trxml’.
- Configuration XML File should contain the file extension ‘.cfgxml’.
- All the function names and the string values configured should follow C syntax for variables. It can only contain alphanumeric characters and “_”. It should start with an alphabet.
- If the output files generated by SPI Driver Generation Tool are modified externally, then they may not produce the expected results or may lead to error/warning/Information messages.
- Short Name for a container should be unique within a name space.
- An error free ECU Configuration Description File generated from configuration editor has to be provided as input to the SPI Driver Generation Tool. Otherwise Tool may not produce the expected results or may lead to errors/warnings/information messages.
- User has to make sure that the respective device specific configuration file is used, otherwise Tool may not produce the expected results or may lead to errors/warnings/information messages.
- The description file should always be generated using AUTOSAR specified configuration editor and it should not be edited manually.

**Remark** Please refer the SPI Component User Manual for deviations from AUTOSAR specifications, if any.

# Chapter 7 User Configuration Validation

This section provides help to analyze the error, warning and information messages displayed during the execution of SPI Driver Generation Tool. It ensures conformance of input file with syntax and semantics. It also performs validation on the input file for correctness of the data.

For more details on list of Error/Warning/Information messages that are displayed as a result of input file(s) validation, refer Chapter 8 “*Messages*”.

The Generation Tool displays error or warning or information when the user has configured incorrect inputs. The format of Error/Warning/Information message is as shown below.

- ERR/WRN/INF<mid><xxx>: <Error/Warning/Information Message>.

  where,

<mid>: 083 - SPI Driver Module Id (083) for user configuration checks.

000 - for command line checks.

<xxx>: 001-999 - Message Id.

- File Name: Name of the file in which the error has occurred.
- Path: Absolute path of the container in which the parameter is present.

‘File Name’ and ‘Path’ need not be present for all Error/Warning/Information messages.

# Chapter 8 Messages

The messages help to identify the syntax or semantic errors in the ECU Configuration Description File. Hence it ensures validity and correctness of the information available in the ECU Configuration Description File.

The following section gives the list of error, warning and information messages displayed by the Generation Tool.

## 8.1 Error Messages

**ERR083001: Number of fields is not same for the entity 'Structure Name'.**

This error occurs, if the number of fields is not same in the structure that is to be generated in the output file.

**ERR083002: Field 'Field Name' is empty in the entity 'Structure Name'.**

This error occurs, if the structure fields that are to be generated in the output file are empty.

**ERR083003: 'SPI Driver/MCU Driver/DEM' Component is not present in the input file(s).**

This error will occur, if SPI Driver or MCU Driver or DEM component is not present in the input ECU Configuration Description File(s).

**ERR083004: The parameter 'parameter name' in the container 'container name' should be configured.**

This error occurs, if any of the mandatory configuration parameter(s) mentioned below is (are) not configured in ECU Configuration Description File. The list of mandatory parameters with respect to container is listed below:

| Parameter Name | Container Name |
|---|---|
| SpiCancelApi | SpiGeneral |
| SpiChannelBuffersAllowed | |
| SpiDevErrorDetect | |
| SpiHwStatusApi | |
| SpiInterruptibleSeqAllowed | |
| SpiLevelDelivered | |
| SpiSupportConcurrentSyncTransmit | |
| SpiVersionInfoApi | |
| SpiDmaMode | |
| SpiDataConsistencyCheckEnable | |
| SpiDataWidthSelection | |
| SpiMaxBaudrate | |
| SpiSyncSeqEndNotificationEnable | |
| SpiPersistentHWConfiguration | |
| SpiDmaTypeUsed | |
| SpiHighPriorityHwHandlingEnable | |
| SpiCriticalSectionProtection | |

| Parameter Name | Container Name |
|---|---|
| SpiDeviceName | SpiGeneral |
| SpiAlreadyInitDetCheck | |
| SpiVersionCheckExternalModules | |
| SpiSeqStartNotificationEnable | |
| SpiTimeOut | |
| SpiMaxChannel | SpiDriver |
| SpiMaxJob | |
| SpiMaxSequence | |
| SpiChannelId | SpiChannel |
| SpiChannelType | |
| SpiDataWidth | |
| SpiEbMaxLength | |
| SpiIbNBuffers | |
| SpiTransferStart | |
| SpiCsPolarity | SpiExternalDevice |
| SpiDataShiftEdge | |
| SpiShiftClockIdleLevel | |
| SpiCsIdentifier | |
| SpiEnableCs | |
| SpiHwUnit | |
| SpiTimeClk2Cs | |
| SpiClk2CsCount | |
| SpiBaudrateConfiguration | |
| SpiInputClockSelect | |
| SpiInterruptDelayMode | |
| SpiParitySelection | |
| SpiFifoTimeOut | |
| SpiBroadcastingPriority | |
| SpiClockFrequencyRef | |
| SpiJobId | SpiJob |
| SpiJobPriority | |
| SpiDeviceAssignment | |
| SpiInterruptibleSequence | SpiSequence |
| SpiSeqStartNotification | |
| SpiSequenceId | |
| SpiHighPriorityHwSequence | |
| SpiJobAssignment | |
| SpiHwUnitSelection | SpiMemoryMode |
| SpiMemoryModeSelection | |
| SpiTxDmaChannel | SpiDma |
| SpiRxDmaChannel | |
| SpiDmaHwUnit | |
| SPI_E_HARDWARE_ERROR | SpiDemEventParameterRefs |
| SPI_E_DATA_TX_TIMEOUT_FAILURE | |
| SpiChannelIndex | SpiChannelList |
| SpiChannelAssignment | |
| SpiMaxHwUnit | SpiPublishedInformation |

**Remark** If the containers SpiMemoryMode and SpiDmaMode are configured, then the respective parameters which are mandatory should be configured.

**ERR083005: In general per configuration set, the value of 'SpiChannelId' parameter should start with <0> and should be sequential without any gaps.**

This error occurs, if the value for parameter SpiChannelId present in the container SpiChannel is not starting with zero and also not sequential or with gaps for any given configuration set.

**ERR083006: The value of the parameter 'SpiChannelType' in the container 'SpiChannel' should be same for SPI Channels (having same channel Id) across multiple configuration sets.**

This error occurs, if the value of parameter SpiChannelType in the container SpiChannel is not same for SPI Channels (having same channel Id) across multiple configuration sets.

**ERR083007: The number of SPI channels configured should be same across the multiple configurations set container 'SpiDriver'.**

This error occurs, if the number of SPI channels configured is not same across the multiple configurations set container SpiDriver.

**ERR083008: The value of the parameters 'SpiEbMaxLength' and 'SpiIbNBuffers' in the container 'SpiChannel' should be same for SPI Channels (having same channel Id) across multiple configuration sets.**

This error occurs, if the value for parameters SpiEbMaxLength and SpiIbNBuffers are not same for all SPI Channels (having same channel Id) across multiple configuration sets in ECU Configuration Description File.

**ERR083009: The short name of the container 'SpiChannel' should be same for channel having same 'SpiChannelId' <value for SpiChannelId> across multiple configurations set container 'SpiDriver'.**

This error occurs, if the short name of the container SpiChannel is not same for channel having same SpiChannelId across multiple configurations set in the container SpiDriver.

**ERR083010: The value of the parameter 'SpiChannelType' in the container 'SpiChannel' should be configured as <EB>, since the value of the parameter 'SpiChannelBuffersAllowed' in the container 'SpiGeneral' is configured as <1>.**

This error occurs, if SpiChannelBuffersAllowed in the container SpiGeneral is configured as 1 and the parameter SpiChannelType in the container SpiChannel is not configured as EB.

**ERR083011: The value of the parameter 'SpiChannelType' in the container 'SpiChannel' should be configured as <IB>, since the value of the parameter 'SpiChannelBuffersAllowed' in the container 'SpiGeneral' is configured as <0>**.

This error occurs, If SpiChannelBuffersAllowed in the container SpiGeneral is configured as 0 and the parameter SpiChannelType in the container SpiChannel is not configured as IB.

**ERR083012: The SPI channels configured for a specific job should not be repeated when the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' is configured as <DUAL_BUFFER_MODE/ TX_ONLY_MODE>.**

This error occurs, if the value for channels configured for a specific job is repeated when the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE.

**ERR083013: The SPI channels configured for a specific job should have same value for the parameter 'SpiDataWidth' of container 'SpiChannel' since the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' is configured as <value of SpiMemoryModeSelection> within a sequence.**

This error occurs, if the value for channels configured for a specific job is not same for the parameter SpiDataWidth of container SpiChannel when the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE or FIFO_MODE.

**ERR083014: The total number of buffers configured for all jobs linked to one CSIH HW Unit should be less than or equal to <64/128> since the value of the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' is configured as <TX_ONLY_MODE> and the parameter 'SpiDataWidth' in the container 'SpiChannel' is configured as less than or equal to <16>.**

This error occurs, if the total number of buffers configured for all jobs linked to one CSIH HW Unit is more than 64/128 when the value of the parameter SpiMemoryModeModeSelection in the container SpiMemoryModeMode is configured as TX_ONLY_MODE and the parameter SpiDataWidth in the container SpiChannel is configured as less than or equal to 16.

**ERR083015: The total number of buffers configured for all jobs linked to one CSIH HW Unit should be less than or equal to <32/64> since the value of the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' is configured as <DUAL_BUFFER_MODE> and the parameter 'SpiDataWidth' in the container 'SpiChannel' is configured as greater than <16>.**

This error occurs, if the total number of buffers configured for all jobs linked to one CSIH HW Unit is more than 32/64 when the value of the parameter SpiMemoryModeModeSelection in the container SpiMemoryModeMode is configured as DUAL_BUFFER_MODE and the parameter SpiDataWidth in the container SpiChannel is configured as greater than 16.

**ERR083016: The value of the parameter 'SpiDataWidth' in the container 'SpiChannel' is not in the range of <7 to 8> since the parameter 'SpiDataWidthSelection' in the container 'SpiGeneral' is configured as<BITS_8>.**

This error occurs, if the value of the parameter SpiDataWidth in the container SpiChannel is not in the range of 7 to 8 when the parameter SpiDataWidthSelection in the container SpiGeneral is configured as BITS_8.

**ERR083017: The value of the parameter 'SpiDataWidth' in the container 'SpiChannel' is not in the range of <7 to 16> since the parameter 'SpiDataWidthSelection' in the container 'SpiGeneral' is configured as <BITS_16>.**

This error occurs, if the value of the parameter SpiDataWidth in the container SpiChannel is not in the range of 7 to 16 when the parameter SpiDataWidthSelection in the container SpiGeneral is configured as BITS_16.

**ERR083018: In general per configuration set, the value of 'SpiJobId' parameter should start with <0> and should be sequential without any gaps.**

This error occurs, if the value for parameter SpiJobId present in the container SpiJob is not sequential or with gaps and also not starting with zero for any given configuration set in the ECU Configuration Description File.

**ERR083019: The number of SPI Jobs configured should be same across the multiple configurations set container 'SpiDriver'.**

This error occurs, if the number of SPI jobs configured is not same across the multiple configurations set container SpiDriver.

**ERR083020: The value of the parameter 'SpiJobEndNotification' configured in the container 'SpiJob' should be unique for jobs with hardware units of different memory modes.**

This error occurs, if the parameter SpiJobEndNotification of the container SpiJob is not unique for jobs with hardware units of different memory modes.

**ERR083021: The value of the parameter 'SpiJobEndNotification' present in the container 'SpiJob' should be same for SPI jobs (having same Job Id).**

This error occurs, if the parameter SpiJobEndNotification in the container SpiJob is not same for SPI jobs (having same Job Id) across multiple configuration sets in ECU Configuration Description File.

**ERR083022: The value for the parameter 'SpiHwUnitSynchronous' in the container 'SpiJob' should be same for jobs that are associated with same sequence.**

This error occurs, if the value for the parameter SpiHwUnitSynchronous in the container SpiJob is not same for jobs that are associated with same sequence. In general, the transfer mode of the jobs (that are associated with same sequence) should be same.

**ERR083023: The value of the parameter 'SpiHwUnitSynchronous' in the container 'SpiJob' should be same for all jobs that are having same value for the parameter 'SpiHwUnit' in the container 'SpiExternalDevice' within a configuration set.**

This error occurs, if the value of the parameter SpiHwUnitSynchronous in the container SpiJob is different for all jobs that are having same value for the parameter SpiHwUnit in the container SpiExternalDevice within a configuration set.

**ERR083024: The value configured for the parameter 'parameter name' should follow C Syntax <[a-zA-Z][a-zA-Z0-9_]>**.

This error occurs, if the value of configuration parameters mentioned below does not adhere to C syntax i.e., the value should not contain characters other than (a-z, A-Z, 0-9 or "_") and it also should start with an alphabet.

| Parameter Name | Container Name |
|---|---|
| SpiJobEndNotification | SpiJob |
| SpiSeqEndNotification | SpiSequence |

**ERR083025: The jobs configured for the parameter 'SpiJobAssignment' in the container 'SpiSequence' should not be repeated since the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' is configured as <DUAL_BUFFER_MODE/TX_ONLY_MODE>.**

This error occurs, if the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE and the jobs configured for the parameter SpiJobAssignment in the container SpiSequence is repeated.

**ERR083026: The value of the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' should be same across the multiple configurations set container 'SpiDriver'**.

This error occurs, if the value of the parameter SpiMemoryModeSelection in the container SpiMemoryMode is not same across the multiple configurations set container SpiDriver.

**ERR083027: The value of the parameter ‘SpiHwUnit’ in the container ‘SpiExternalDevice’ should be same when the parameter ‘SpiMemoryModeSelection’ in the container ‘SpiMemoryMode’ is configured as <value of the parameter SpiMemoryModeSelection> within a sequence.**

This error occurs, if the value of the parameter SpiHwUnit in the container SpiExternalDevice is not same when the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DUAL_BUFFER_MODE and TX_ONLY_MODE within sequence.

**ERR083028: The short name of the container ‘SpiJob’ should be same for job having same 'SpiJobId' <value for SpiJobId> across multiple configurations set container ‘SpiDriver’.**

This error occurs, if the short name of the container SpiJob is not same for SPI jobs (having same job Id) across multiple configurations set container SpiDriver.

**ERR083029: The value of the parameter ‘SpiHwUnit’ in the container ‘SpiExternalDevice’ is configured as <value of SpiHwUnit>. The value <value of SpiHwUnit> is not configured for the parameter ‘SpiHwUnitSelection’ in the container ‘SpiMemoryMode’.**

This error occurs, if the value of the parameter SpiHwUnit in the container SpiExternalDevice is configured as CSIHn and the same value is not configured to the parameter SpiHwUnitSelection in the container SpiMemoryMode. Here n is integer numbers e.g. 0, 1, etc.

**ERR083030: The value of the parameter 'SpiHwUnit' in the container ‘SpiExternalDevice’ is not configured for the same memory mode as the memory mode of the other jobs in the respective sequence.**

This error occurs, if the value of the parameter SpiHwUnit in the container SpiExternalDevice is not configured for the same memory mode as the memory mode of the other jobs in the respective sequence.

**ERR083031: The value <value of SpiHwUnitSelection> configured for the parameter 'SpiHwUnitSelection’ present in the container 'SpiMemoryMode’ should be unique within configuration set container**
**'SpiDriver'.**

This error occurs, if the value of the parameter SpiHwUnitSelection in the container SpiMemoryMode is not unique within configuration set container SpiDriver.

**ERR083032: The same value should be configured for the parameter ‘SpiHwUnit’ in the container 'SpiExternalDevice' across the multiple configuration sets.**

This error occurs, if the value configured for the parameter SpiHwUnit in the container SpiExternalDevice is not same across multiple configuration sets.

**ERR083033: The value of the parameter 'SpiHwUnitSelection' in the container 'SpiMemoryMode' is configured as <value for SpiHwUnitSelection>, but none of the container 'SpiExternalDevice' has configured 'SpiHwUnit' as <value for SpiHwUnitSelection>.**

This error occurs, if the hardware unit configured in the container SpiMemoryMode is not present in any of the SpiExternalDevice container.

**ERR083034: The number of SPI sequences configured should be same across multiple configurations set container ‘SpiDriver’.**

This error occurs, if the numbers of SPI sequences configured are not same across the multiple configurations set container SpiDriver.

**ERR083035: The value of parameter 'SpiSeqEndNotification' present in the container 'SpiSequence' should be unique for the sequences having jobs with hardware units of different memory modes.**

This error occurs, if the value of parameter SpiSeqEndNotification present in the container SpiSequence is not unique for the sequences having jobs with hardware units of different memory modes.

**ERR083036: The parameter ‘SpiSeqEndNotification’ in the container ‘SpiSequence’ should be same for sequences having same 'SpiSequenceId' <value for SpiSequenceId> across multiple configurations set container ‘SpiDriver’.**

This error occurs, if the parameter SpiSeqEndNotification in the container SpiSequence is not same for SPI Sequences (having same Sequence Id) across multiple configurations set container SpiSequence.

**ERR083037: In general per configuration set, the value of ‘SpiSequenceId’ parameter should start with <0> and should be sequential without any gaps.**

This error occurs, if the parameter SpiSequenceId is not sequential or with gaps and also not starting with zero within the container SpiSequence for any of the given configuration set.

**ERR083038: The short name of the container ‘SpiSequence’ should be same for sequence having same 'SpiSequenceId' <value for SpiSequenceId> across multiple configurations set container ‘SpiDriver’.**

This error occurs, if the short name of the container SpiSequence is not same for SPI Sequences (having same Sequence Id) across multiple configurations set container ‘SpiDriver’.

**ERR083039: The value of parameter ‘SpiPortPinSelect’ in the container ‘SpiJob’ should not be configured as <value of the parameter SpiPortPinSelect> since the value of the parameter ‘SpiCsSelection’ present in the container ’SpiExternalDevice’ is configured as <value of the parameter SpiCsSelection>.**

This error occurs, if the value of the parameter SpiPortPinSelect in the container SpiJob is configured as CSLn and the parameter SpiCsSelection present in the container SpiExternalDevice is configured as CS_VIA_GPIO. Here n is the integer number e.g. 0, 1, etc.

**ERR083040: The value of parameter ‘SpiPortPinSelect’ in the container ‘SpiJob’ should not be configured as <value of the parameter SpiPortPinSelect> since the value of the parameter ‘SpiCsSelection’ present in the container ’SpiExternalDevice’ is configured as <value of the parameter SpiCsSelection>.**

This error occurs, if the value of the parameter SpiPortPinSelect in the container SpiJob is configured as Port group related pins and the parameter SpiCsSelection present in the container SpiExternalDevice is configured as CS_VIA_PERIPHERAL_ENGINE.

**ERR083041: The value of parameter ‘SpiChannelType’ in the container ‘SpiChannel’ should be configured as <IB> since the parameter ‘SpiMemoryModeSelection’ in the container ‘SpiMemoryMode’ is configured with one of the values from <value of the parameter SpiMemoryModeSelection>.**

This error occurs, if the value of the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE and the parameter SpiChannelType in the container SpiChannel is not configured as IB.

The value of the parameter SpiChannelType in the SpiChannel container can be configured as EB, if the parameter SpiHighPriorityHwHandlingEnable is configured as true in SpiGeneral container and if this channel is linked to a job which is linked to a high priority sequence.

**ERR083042: The parameter ‘SpiHwUnit’ present in the container ‘SpiExternalDevice’ is configured as <value of the parameter SpiHwUnit> and all of the following parameters (SpiCsIdleEnforcement, SpiCsIdleTiming, SpiCsHoldTiming, SpiCsInterDataDelay and SpiCsSetupTime) should be configured.**

This error occurs, if the parameter SpiHwUnit present in the container SpiExternalDevice is configured as CSIHm and any of the parameters SpiCsIdleEnforcement, SpiCsIdleTiming, SpiCsHoldTiming, SpiCsInterDataDelay and SpiCsSetupTime is not configured. Here m is integer number e.g. 0, 1, etc.

**ERR083043: The parameter ‘SpiPortPinSelect’ in the container ‘SpiJob’ configured should be only one unique value, since the value of parameter ‘SpiHwUnit’ present in the container ‘SpiExternalDevice’ is configured as <value of the parameter SpiHwUnit>.**

This error occurs, if the value of the parameter SpiHwUnit present in the container SpiExternalDevice is configured as CSIGn and more than one unique value is configured for the parameter SpiPortPinSelect in the container SpiJob. Here n is integer number e.g. 0, 1, etc.

**ERR083044: The value of the parameter ‘SpiMaxChannel’ should be equal to the total number of 'SpiChannel' container configured within each 'SpiDriver' container.**

This error occurs, if the value of the parameter SpiMaxChannel present in container SpiDriver is not equal to total number of channels configured within each SpiDriver container in ECU Configuration Description File.

**ERR083045: The value of the parameter ‘SpiMaxJob’ should be equal to the total number of 'SpiJob' container configured within each 'SpiDriver' container.**

This error occurs, if the value of the parameter SpiMaxJob in the container SpiDriver is not equal to the total number of jobs configured within each SpiDriver container in ECU Configuration Description File.

**ERR083046: The value of the parameter ‘SpiMaxSequence’ should be equal to the total number of 'SpiSequence' container configured within each 'SpiDriver' container.**

This error occurs, if the value of the parameter SpiMaxSequence in the container SpiDriver is not equal to the total number of jobs configured within each SpiDriver container in ECU Configuration Description File.

**ERR083048: The value of the parameter ‘SpiMemoryModeSelection’ in the container ‘SpiMemoryMode’ should be configured as <DIRECT_ACCESS_MODE> since the value configured for the parameter ‘SpiLevelDelivered’ in the container ‘SpiGeneral’ is <0>.**

This error occurs, if the value configured for the parameter SpiLevelDelivered in the container SpiGeneral is 0 and the value of the parameter SpiMemoryModeSelection in the container SpiMemoryMode is not configured as DIRECT_ACCESS_MODE.

**ERR083049: At least one instance of the container 'SpiDma' should be configured as the value of parameter 'SpiDmaMode' present in the container 'SpiGeneral' is configured as <true>.**

This error occurs, if the parameter SpiDmaMode present in the container SpiGeneral is configured as true and no instance of the container SpiDma is configured.

**ERR083050: The value configured for the parameters ‘SpiTxDmaChannel’ and ‘SpiRxDmaChannel’ should be unique within a configuration set.**

This error occurs, if the same DMA channel is configured for SpiTxDmaChannel or SpiRxDmaChannel of SpiDma container for hardware units (SpiDmaHwUnit) within a configuration set. DMA channel (Tx or Rx) should be unique within a configuration set.

**ERR083051: The number of SPI DMA configured should be same across multiple configurations set container ‘SpiDriver’.**

This error occurs, if the number of SPI DMA configured is not same across multiple configurations set container SpiDriver.

**ERR083052: The value configured in the parameters ‘SpiTxDmaChannel’ and ‘SpiRxDmaChannel’ in the container ‘SpiDma’ should be same across multiple configuration sets.**

This error occurs, if the value configured in the parameters SpiTxDmaChannel and SpiRxDmaChannel in the container SpiDma is not same across multiple configuration set.

**ERR083053: The value configured for the parameter 'SpiDmaHwUnit' in the container 'SpiDma' should be configured in any of the hardware units selected for jobs.**

This error occurs, if the value configured for the parameter SpiDmaHwUnit in the container SpiDma is not configured in any of the hardware units selected for jobs.

**ERR083054: The value of the parameter 'SpiDataWidth' in the container 'SpiChannel' should not be greater than 16, since the corresponding channel is associated with DMA HW unit <Configured as DMA HW Unit>.**

This error occurs, if the configured value of the parameter SpiDataWidth in the container SpiChannel is greater than 16 and the corresponding HW Unit is configured for DMA.

**ERR083055: The value of parameter 'SpiPortPinSelect' <value of the SpiPortPinSelect> in the container 'SpiJob' should not be same since the hardware units configured for respective jobs are not same.**

This error occurs, if the value of parameter SpiPortPinSelect is configured in the container SpiJob is same and the hardware units configured for respective jobs are different. This error is applicable only for CSIG hardware unit related jobs.

**ERR083056: The DMA HW unit configured in 'SpiDmaHwUnit' parameter of the container 'SpiDma' is invalid as 'SpiDmaMode' parameter is configured as <true> and the same DMA HW unit is configured as <SYNCHRONOUS> in the parameter ‘SpiHwUnitSynchronous’ of the container ‘SpiJob’.**

This error occurs, if the SpiDmaMode parameter is configured as true and the same DMA HW unit is configured as SYNCHRONOUS in the parameter SpiHwUnitSynchronous of the container SpiJob.

**ERR083057: The value of the parameter 'SpiChannelIndex' configured in container 'SpiChannelList' should be <Expected value of SpiChannelIndex>. In general per Spi Job, the value of 'SpiChannelIndex' parameter should start with <0> and should be sequential without any gaps.**

This error occurs, if value of the parameter SpiChannelIndex in the container SpiChannelList is not starting with 0 and not sequential for any SpiJobId parameter in the container SpiJob.

**ERR083058: The reference path <path> provided for the parameter 'parameter name' in the container 'container name', having short name<container short name> is incorrect.**

This error occurs, if incorrect reference provided for any of the reference parameters (SPI_E_HARDWARE_ERROR, SpiClockFrequencyRef, SpiDeviceAssignment, SpiChannelAssignment and SpiJobAssignment).

**ERR083059: The value of the parameter 'SpiHwUnitSynchronous' in the container 'SpiJob' should be same for all jobs that are having same value for the parameter 'SpiHwUnit' in the container 'SpiExternalDevice' across multiple configurations set container 'SpiDriver'.**

This error occurs, if the value of the parameter SpiHwUnitSynchronous in the container SpiJob is different for all jobs that are having same value for the parameter SpiHwUnit in the container SpiExternalDevice across multiple configurations set container SpiDriver.

**ERR083061: The value of the parameter 'SpiCsSelection' in the container 'SpiExternalDevice' should not be configured as <value of the parameter SpiCsSelection> since the value of the parameter 'SpiHwUnit' is configured as <value of the parameter SpiHwUnit>.**

This error occurs, if the value of the parameter SpiHwUnit in the container SpiExternalDevice is configured as CSIG<n> and the value of the parameter SpiCsSelection in the container SpiExternalDevice is configured as CS_VIA_PERIPHERAL_ENGINE. Here <n> is an integer number e.g. 0, 1 etc.

**ERR083062: The value of the parameter 'SpiCsSelection' in the container 'SpiExternalDevice' should be configured, since the value of the parameter 'SpiEnableCs' in the container 'SpiExternalDevice' is configured as <true>.**

This error occurs, if the value of the parameter SpiEnableCs in the container SpiExternalDevice is configured as true and the parameter SpiCsSelection in the container SpiExternalDevice is not configured.

**ERR083063: The value of the parameter 'SpiPortPinSelect' in the container 'SpiJob' should be configured, since the value of the parameter 'SpiEnableCs' in the container 'SpiExternalDevice' is configured as <true>.**

This error occurs, if the value of the parameter SpiEnableCs in the container SpiExternalDevice is configured as true and the parameter SpiPortPinSelect in the container SpiJob is not configured.

**ERR083064: The value of the parameter 'SpiCsSelection' in the container 'SpiExternalDevice' should not be configured, since the value of the parameter 'SpiEnableCs' in the container 'SpiExternalDevice' is configured as <false>.**

This error occurs, if the value of the parameter SpiEnableCs in the container SpiExternalDevice is configured as false and the parameter SpiCsSelection in the container SpiExternalDevice is configured.

**ERR083065: The value of the parameter 'SpiPortPinSelect' in the container 'SpiJob' should not be configured, since the value of the parameter 'SpiEnableCs' in the container 'SpiExternalDevice' is configured as <false>.**

This error occurs, if the value of the parameter SpiEnableCs in the container SpiExternalDevice is configured as false and the parameter SpiPortPinSelect in the container SpiJob is configured.

**ERR083066: The DMA HW unit is configured in 'SpiDmaHwUnit' parameter of 'SpiDma' container is invalid as the memory mode of the respective hardware unit is configured as <Configured memory mode>.**

This error occurs, if DMA HW unit configured for the parameter SpiDmaHwUnit in the container SpiDma is configured with the memory mode of TX_ONLY_MODE or DUAL_BUFFER_MODE.
If SpiHighPriorityHwHandlingEnable is configured as true in SpiGeneral container then the DMA HW unit configured for the parameter SpiDmaHwUnit in the container SpiDma can be configured with the memory mode of TX_ONLY_MODE.

**ERR083067: The value of the parameter 'SpiHwUnitSynchronous' in the container 'SpiJob' should be configured, since the value of the parameter 'SpiLevelDelivered' in the container 'SpiGeneral' is configured as <2>.**

This error occurs, if the value of the parameter SpiLevelDelivered in the container SpiGeneral is configured as 2 and the parameter SpiHwUnitSynchronous in the container SpiJob is not configured.

**ERR083068: The value for the parameter 'SpiLevelDelivered' in the container 'SpiGeneral' is configured as <2> and the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' should be configured as <DIRECT_ACCESS_MODE>, since the respective HW Unit is configured for <SYNCHRONOUS> in the parameter 'SpiHwUnitSynchronous' of the container 'SpiJob'.**

This error occurs, if the value of the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DIRECT_ACCESS_MODE and the respective HW Unit is configured for SYNCHRONOUS in the parameter SpiHwUnitSynchronous of the container SpiJob with the value configured for the parameter SpiLevelDelivered in the container SpiGeneral is 2.

**ERR083069: The SPI channel configured across jobs should not be repeated when the parameter ' SpiMemoryModeSelection' in the container ' SpiMemoryMode' is configured as <DUAL_BUFFER_MODE/ TX_ONLY_MODE>.**

This error occurs, if the value of the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE and the channels configured for respective jobs are repeated.

**ERR083070: The parameter 'SpiInterruptibleSequence' in the container 'SpiSequence' should be configured as <false>, since the jobs connected to the sequence having the value of the parameter 'SpiMemoryModeSelection' in the container 'SpiMemoryMode' is configured as <DUAL_BUFFER_MODE/TX_ONLY_MODE>.**

This error occurs, if the jobs connected to the sequence having the value of the parameter SpiMemoryModeSelection in the container SpiMemoryMode is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE and the value of the parameter SpiInterruptibleSequence in the container SpiSequence is not configured false.

**ERR083072: The value of the parameter ‘SpiDataWidth’ in the container ‘SpiChannel’ is not in the range of <2 to 32> since the value of the parameter ‘SpiHwUnit’ in the container SpiExternalDevice’ is configured as CSIHn.**

This error will occur, if the value of the parameter SpiDataWidth in the container SpiChannel is not in the range of 2 to 32 and the value of the parameter SpiHwUnit in the container SpiExternalDevice is configured as CSIH<n>. Here <n> is integer numbers e.g. 0, 1, etc.

**ERR083075: The chip select for the job <SpiJob short name> should not be configured as <Chip select value>, since this chip select is associated with a sequence <SpiSequence short name> which is having ‘SpiHighPriorityHwSequence' parameter is configured as <true>.**

This error occurs, if the chip select for the job is configured as Chip select value and this chip selects is associated with sequence which is having SpiHighPriorityHwSequence parameter is configured as true.

**ERR083076: Maximum acceptable baud rate for the Job <SpiJob short name> should be less than or equal to PCLK/4 in external device <SpiExternal device short name> in the configuration set <SpiDriver short name>.**

This error occurs, when maximum acceptable baud rate for the job is greater than PCLK/4.

**ERR083078: The value of parameter ‘SpiHighPriorityHwSequence' present in the container ‘SpiSequence' should be configured as <true> for at least one of the sequences, since the parameter ‘SpiHighPriorityHwHandlingEnable' present in the container 'SpiGeneral' is configured as <true>.**

The error occurs, if the value of the parameter SpiHighPriorityHwSequence present in the container SpiSequence is not configured as true for none of the sequences and the value of parameter SpiHighPriorityHwHandlingEnable present in the container SpiGeneral is configured as true.

**ERR083080: The value configured for the parameter 'SpiSeqStartNotification' should follow C Syntax < [a-zA-Z] [a-zA-Z0-9_]>.**

This error occurs, if the value of configuration parameters mentioned below does not adhere to C syntax i.e., the value should not contain characters other than (a-z, A-Z, 0-9 or “_”) and it also should start with an alphabet.

**ERR083081: The value of parameter 'SpiSeqStartNotification' present in the container 'SpiSequence' should be unique for the sequences having jobs with hardware units of different memory modes.**

The error occurs, if the value configured for the parameter 'SpiSeqStartNotification' in the 'SpiSequence' container is same for the sequences having jobs with hardware units of different memory modes.

**ERR083082: The short name of the container ‘SpiSequence’ should be same for sequence having same 'SpiSequenceId' <value for SpiSequenceId> across multiple configurations set container ‘SpiDriver’.**

This error occurs, if the short name of the container SpiSequence is not same for SPI Sequences (having same Sequence ID) across multiple configurations set container ‘SpiDriver’.

**ERR083084: The parameter ‘SpiSeqStartNotification’ in the container ‘SpiSequence’ should be same for sequences having same 'SpiSequenceId' <value for SpiSequenceId> across multiple configurations set container ‘SpiDriver’.**

This error will occur, if the parameter SpiSeqStartNotification in the container SpiSequence is not same for SPI Sequences (having same Sequence ID) across multiple configurations set container SpiSequence.

| Parameter Name | Container Name |
|---|---|
| SpiSeqStartNotificationEnable | SpiGeneral |
| SpiSeqStartNotification | SpiSequence |

**ERR083085: The parameter 'SpiSeqEndNotification' in the container 'SpiSequence' should not be configured, when the parameter 'SpiHwUnitSynchronous' in the container 'SpiJob' is configured with value 'SYNCHRONOUS' since the pre-compile parameter 'SpiSyncSeqEndNotificationEnable' in the 'SpiGeneral' container is configured as false.**

This error will occur if value of the parameter SpiHwUnitSynchronous in the container 'SpiJob' is configured as 'Synchronous' , when the parameter 'SpiSyncSeqEndNotificationEnable' in SpiGeneral container is FALSE and the sequence to which the 'SpiJob' belongs has Sequence end notification configured.

| Parameter Name | Container Name |
|---|---|
| SpiSyncSeqEndNotificationEnable | SpiGeneral |
| SpiSeqEndNotification | SpiSequence |

**ERR083086: The value of the parameter 'SpiInputClockSelect' in the container '/Renesas/Spi0/SpiDriverx/SpiExternalDevicex' should be same for all Jobs using the same SpiHwUnit 'CSIHx'.**

The error occurs, if value of the parameter 'SpiInputClockSelect' in the container SpiExternalDevice is not same for all jobs using the same SpiHwUnit.

**ERR083087: The value of the parameter 'SpiBaudrateConfiguration' for 'CSIH_BAUDRATE_REGISTER_x' in the container '/Renesas/Spi0/SpiDriverx/SpiExternalDevicex' should be same for all Jobs using the same SpiHwUnit 'CSIHx'**

The error occurs, if value of the parameter 'SpiBaudrateConfiguration' for a baudrate register in the container SpiExternalDevice is not same for all SpiExternalDevices using the same baudrate register for all jobs using the same SpiHwUnit.

**ERR083088: The value of the parameter 'SpiPortPinSelect' in the container '/Spi0/SpiDriverx/SpiJobz' used for '/Renesas/Spi0/SpiDriverx/SpiExternalDevicex' should not be used for '/Renesas/Spi0/SpiDriverx/SpiExternalDevicey' in '/Spi0/SpiDriver0/SpiJobw'.**

The error occurs, if the same value of the parameter SpiPortPinSelect used by an SpiExternalDevice in a SpiJob container is configured for an another SpiPortPinSelect used by another SpiExternalDevice in an another SpiJob.

**ERR083089: The value of the parameter 'SpiCsPolarity' in the container 'SpiExternalDevice5' used for 'CSIH0' should be same as value of the parameter 'SpiCsPolarity' in the container 'SpiExternalDevice0' used for 'CSIH0'.**

The error occurs, if the value of the parameter SpiCsPolarity in the container SpiExternalDevice, is not same across all the external devices using the same SpiHwUnit CSIHx using the same chipselect.

**ERR083090: The value of the parameter 'SpiFifoTimeOut' across the containers 'SpiExternalDevicex' and 'SpiExternalDevicey' should be same as they are referring the same SpiHw 'CSIHn'.**

This error occurs, if the value of the parameters SpiCsInactiveAfterLastData, SpiShiftClockIdleLevel, SpiInputClockSelect, SpiInterruptDelayMode, and SpiFifoTimeOut in the SpiExternalDevice container are not same across the External devices mapped to the same SpiHw Unit.

**ERR083091: The value of the parameter 'SpiTransferStart' across the containers 'SpiChannelx' and 'SpiChannely' should be same as they are referring the same SpiHw 'CSIHn'.**

The error occurs, if value of the parameters SpiDataWidth, SpiTransferStart present in SpiChannel container are not same across all the channel containers using the same SpiHw Unit and SpiPersistentHWConfiguration is configured as true.

In case of CSIHx SpiHw Unit the values of the parameters SpiDataWidth, SpiTransferStart present in SpiChannel container are not same across all the channel containers using the same CSIHx SpiHw and the same chipselect lines and SpiPersistentHWConfiguration is configured as true.

In case of CSIGn SpiHw Unit the values of the parameters SpiDataWidth, SpiTransferStart present in SpiChannel container are not same across all the channel containers using the same CSIGn SpiHw and SpiPersistentHWConfiguration is configured as true.

| Container | Parameters |
|---|---|
| SpiChannel | SpiDataWidth |
| | SpiTransferStart |
| SpiGeneral | SpiPersistentHWConfiguration |

**ERR083092: The reference path <path> provided for the parameter ‘parameter name’ in the container ‘container name’, having short**

**name <container short name> is incorrect.**

This error occurs, if incorrect reference provided for the reference parameter (‘SPI_E_DATA_TX_TIMEOUT_FAILURE’).

**ERR083093: The reference path <path> provided for the parameters ‘parameter name’ and ‘parameter name’ in the container ‘container name’ should be unique.**

This error occurs, if the reference path provided for the parameters SPI_E_HARDWARE_ERROR and SPI_E_DATA_TX_TIMEOUT_FAILURE, are not unique.

**ERR083094: The reference path for parameter 'SPI_E_DATA_TX_TIMEOUT_FAILURE/ SPI_E_HARDWARE_ERROR' in the container 'SpiDemEventParameterRefs' should be same across multiple configuration set.**

This error occurs, if the reference path provided for the parameters 'SPI_E_DATA_TX_TIMEOUT_FAILURE/ SPI_E_HARDWARE_ERROR is not same across multiple configuration sets.

**ERR083107: The value configured for the parameter ‘SpiDmaTrigCtrlOnCS’ should be same across multiple configuration set.**

This error occurs, when the value configured for the parameterSpiDmaTrigCtrlOnCS is not same across multiple configuration set.

**ERR083108: When the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma, then the parameter ‘SpiPortPinSelect’ should be configured as <value of parameter SpiPortPinSelect> (only one chip select) in the container SpiJob".**

This error occurs, when the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and the parameter SpiPortPinSelect is configured other than <value of parameter SpiPortPinSelect> in the container SpiJob.

**ERR083109: When the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma, then the parameter 'SpiPortPinSelect' should be configured as <value of parameter SpiPortPinSelect> (only one chip select) in the container SpiJob".**

This error occurs, when the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and multiple chip selects are configured for the parameter SpiPortPinSelect other than <value of parameter SpiPortPinSelect> in the container SpiJob.

**ERR083110: When the parameter ' SpiDmaHwUnit' is configured as <value of parameter SpiDmaHwUnit> then the parameter 'SpiDmaTrigCtrlOnCS' should be configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container 'SpiDma' and the parameter 'SpiPortPinSelect' should be configured as <value of parameter SpiPortPinSelect> in the container SpiJob.**

This error occurs, when the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and the parameter SpiPortPinSelect' is not configured as <value of parameter SpiPortPinSelect> in the container SpiJob.

**ERR083111: When the parameter ' SpiDmaHwUnit' is configured as <value of parameter SpiDmaHwUnit> then the parameter 'SpiDmaTrigCtrlOnCS' should be configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container 'SpiDma' and the parameter 'SpiPortPinSelect' should be configured as <value of parameter SpiPortPinSelect>(one chip select) in the container SpiJob.**

This error occurs, when the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and the parameter SpiPortPinSelect is configured with multiple chip select values in the container SpiJob.

**ERR083112: When the parameter 'SpiDmaHwUnit' is configured as <value of parameter SpiDmaHwUnit> and the parameter 'SpiDmaTrigCtrlOnCS' is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container 'SpiDma' then the parameter 'SpiPortPinSelect' should be configured as <value of parameter SpiPortPinSelect> only in the container SpiJob.**

This error occurs, When the parameter SpiDmaHwUnit is configured as <Value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and the parameter SpiPortPinSelect is configured other than <value of parameter SpiPortPinSelect> in the container SpiJob.

**ERR083113: When the parameter 'SpiDmaHwUnit' is configured as <value of parameter SpiDmaHwUnit> and the parameter 'SpiDmaTrigCtrlOnCS' is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container 'SpiDma' then the parameter 'SpiPortPinSelect' should be configured as <value of parameter SpiPortPinSelect> only in the container SpiJob.**

This error occurs, when the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and the parameter SpiPortPinSelect is configured with multiple chip selects in the container SpiJob.

**ERR083114: When the parameter 'SpiDmaHwUnit' is configured as <value of parameter SpiDmaHwUnit> and the parameter 'SpiDmaTrigCtrlOnCS' is configured as <value of parameter SpiDmaTrigCtrlOnCS> or <value of parameter <SpiDmaTrigCtrlOnCS> in the container 'SpiDma', then at least one <value of chip select> should be configured for the parameter 'SpiPortPinSelect' in the container SpiJob.**

This error occurs, when the parameter SpiDmaHwUnit' is configured as <value of parameter SpiDmaHwUnit> and the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> or <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma, then at least one <value of chip select> should be configured for the parameter SpiPortPinSelect in the container SpiJob.

**ERR083115: When the parameter ' SpiDmaHwUnit' is configured as <value of parameter SpiDmaHwUnit> then the parameter 'SpiDmaTrigCtrlOnCS' should be configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container 'SpiDma' and the parameter 'SpiPortPinSelect' should be configured as <value chip select> only in the container SpiJob.**

This error occurs, When the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> then the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and the parameter SpiPortPinSelect is not configured as <value chip select> only in the container SpiJob.

**ERR083116: When the parameter ‘ SpiDmaHwUnit’ is configured as <value of parameter SpiDmaHwUnit> then the parameter ‘SpiDmaTrigCtrlOnCS’ should be configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container ‘SpiDma’ and the parameter ‘SpiPortPinSelect’ should be configured as <value chip select> only in the container SpiJob.**

This error occurs, when the parameter SpiDmaHwUnit is configured as <value of parameter SpiDmaHwUnit> then the parameter SpiDmaTrigCtrlOnCS is configured as <value of parameter SpiDmaTrigCtrlOnCS> in the container SpiDma and the parameter SpiPortPinSelect is configured with multiple chip selects in the container SpiJob.

**ERR083117: The value of parameter ‘SpiCsSelection‘ in the container ‘SpiExternalDevice’ should not be configured as <CS_VIA_GPIO> since the value of the parameter ‘SpiHwUnit’ is configured as < CSIH>.**

This error occurs, if the value of the parameter SpiHwUnit in the container SpiExternalDevice is configured as CSIH<n> and the value of the parameter SpiCsSelection in the container SpiExternalDevice is configured as CS_VIA_GPIO. Here <n> is an integer number e.g. 0, 1 etc.

**ERR083119: The parameter ' SPI_E_READBACK_FAILURE' in the container 'SpiDemEventParameterRefs' has to be configured when the parameter 'SpiReadBackConfiguration' is configured as <TRUE> in 'SpiGeneral' container.**

This error occurs, if the parameter SPI_E_READBACK_FAILURE is not configured in the container SpiDemEventParameterRefs when the parameter SpiReadBackConfiguration is configured as <TRUE> in 'SpiGeneral' container.

**ERR083120: The parameter 'SpiPortPinSelect' value in the container 'SpiJob<x>', should be configured as CSL<n> since 'CSIH<x>' is configured.**

This error will occur if SpiPortPinSelect is not configured when SpiHwUnit is configured with CSIHn device.

**ERR083121: The value of the parameter ‘SpiDataWidth’ in the container ‘SpiChannel’ is not in the range of <7 to 32> since the value of the parameter ‘SpiHwUnit’ in the container ‘SpiExternalDevice’ is configured as CSIGn.**

This error will occur, if the value of the parameter SpiDataWidth in the container SpiChannel is not in the range of 7 to 32 and the value of the parameter SpiHwUnit in the container SpiExternalDevice is configured as CSIG<n>. Here <n> is integer numbers e.g. 0, 1, etc.

**ERR083122: The SPI channel having channel id <value of the parameter SpiChannelId> configured in the container 'SpiChannel' should be referred by any of the SPI job.**

This error occurs, if configured SPI channel is not referred by any of the SPI job.

## 8.2 Warning Messages

**WRN083002: The value of parameter 'SpiDeviceAssignment' from the container 'short name of SpiJob container of one SpiPortPinSelect' and 'short name of SpiJob container of another SpiPortPinSelect' should be same since the value of parameter 'SpiPortPinSelect' of respective jobs is same, the memory mode of the respective Job's hardware unit is configured as <DUAL_BUFFER_MODE or TX_ONLY_MODE> and the respective jobs belong to the same sequence.**

This warning occurs, if SpiDeviceAssignment parameter in SpiJob is not same for the jobs having same SpiHwUnit and SpiPortPinSelect with in the same SpiSequence and the memory mode of the respective Job's hardware unit is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE.

**WRN083004: The value for 'SpiDmaMode' should be configured as <false> since the value of the parameter 'SpiLevelDelivered' is configured as <0>. Hence configuration value for DMA will be ignored for this configuration.**

This warning occurs, if the value for parameter SpiLevelDelivered is 0 and SpiDmaMode is configured as true.

**WRN083005: The value of parameter 'SpiDataWidth' from 'SpiChannel' container is <value of parameter SpiDataWidth> and the value of parameter 'SpiDefaultData' is <value of parameter SpiDefaultData>. Hence only Least Significant Byte is considered from the value of parameter 'SpiDefaultData'.**

This warning occurs, if the value configured in the parameter SpiDefaultData of container SpiChannel is greater than the value (2 SpiDataWidth – 1) of the same container when, the value of SpiDataWidthSelection in the container SpiGeneral is configured as BITS_8.

**WRN083006: The value of parameter 'SpiDataWidth' from 'SpiChannel' container is <value of parameter SpiDataWidth> and the value of parameter 'SpiDefaultData' is <value of parameter**

**SpiDefaultData>. Hence only Least Significant Word is considered from the value of parameter 'SpiDefaultData'.**

This warning occurs, if the value configured in the parameter SpiDefaultData of container SpiChannel is greater than the value (2 SpiDataWidth – 1) of the same container when, the value of SpiDataWidthSelection in the container SpiGeneral is configured as BITS_16.

**WRN083007: The SPI jobs having Job Id <value of the parameter'SpiJobId'> configured in the container 'SpiJob' should be referred by any of the SPI sequence.**

This warning occurs, if configured SPI job is not referred by any of the SPI sequence in ECU Configuration Description File.

**WRN083009: The value of parameter 'SpiDmaMode' from the container 'SpiGeneral' is configured as <false> and the container 'SpiDma' is configured. In this case, the configuration provided in 'SpiDma' container is ignored.**

This warning occurs, if the value of parameter SpiDmaMode from the container SpiGeneral is configured as false and the container SpiDma is configured. In this case, the configuration provided in SpiDma container is ignored.

**WRN083010: The value for parameter 'SpiCsPolarity', 'SpiCsInactive', 'SpiInterruptDelayMode', 'SpiInputClockSelect' or 'SpiBaudrateConfiguration' from the container 'SpiExternalDevice' should be same since the memory mode of the respective hardware unit is configured as <DUAL_BUFFER_MODE or TX_ONLY_MODE> and the respective jobs belong to the same sequence. Only the configured value(s) for the first Job is considered.**

This warning occurs, if the value for parameter SpiCsPolarity, SpiCsInactive, SpiInterruptDelayMode, SpiInputClockSelect or SpiBaudrateConfiguration from the container SpiExternalDevice is not same, the memory mode of the respective hardware unit is configured as DUAL_BUFFER_MODE or TX_ONLY_MODE and the respective jobs belong to the same sequence. Only the configured value(s) for the first Job is considered.

**WRN083012: SpiMemoryModeSelection for Spi jobs value of the SpiJob short name of the value of the SpiSequence should be <TX_ONLY_MODE>, since the parameter SpiHighPriorityHwSequence in the SpiSequence container is configured as <true> for this sequence. Hence the generation tool ignores the value configured for the parameter SpiHighPriorityHwSequence for this sequence.**

This warning occurs, if the SpiMemoryModeSelection for Spi jobs value of the SpiJob short name of the value of the SpiSequence should be <TX_ONLY_MODE>, since the parameter SpiHighPriorityHwSequence in

the SpiSequence container is configured as <true> for this sequence. Hence the generation tool ignores the value configured for the parameter SpiHighPriorityHwSequence for this sequence.

**WRN083079: The parameter 'SpiSeqStartNotification' in the container 'SpiSequence' should not be configured, since the pre-compile parameter, SpiSeqStartNotificationEnable' in the 'SpiGeneral' container is configured as false.**

The warning occurs if value is configured for the parameter 'SpiSeqStartNotification ‘in the container 'SpiSequence' when the parameter 'SpiSeqStartNotificationEnable' in the 'SpiGeneral' container is configured as false.

**WRN083080: The value of the parameters 'SpiCsIdleEnforcement' and 'SpiCsInactiveAfterLastData' in the container 'SpiExternalDevice0' are ignored for any CSIG HW Unit.**

The warning will occur if the values are configured for parameters SpiCsIdleEnforcement and SpiCsInactiveAfterLastData in the container SpiExternalDevice for a CSIG HW Unit.

**WRN083081: The value of the parameter 'SpiCsInactiveAfterLastData' in the container 'SpiExternalDevice' is ignored for any CSIH HW Unit as 'SpiCsIdleEnforcement' is configured as true.**

The warning will occur if the values are configured for parameters SpiCsIdleEnforcement is true and SpiCsInactiveAfterLastData is false in the container SpiExternalDevice for a CSIH HW Unit.

**WRN083084: The parameter ‘SpiLevelDelivered’ is configured as <0> and ‘SpiInterruptibleSeqAllowed’ in the container ‘SpiGeneral’ is configured as <true>. Hence the value of parameter ‘SpiInterruptibleSeqAllowed’ in the container ‘SpiGeneral’ is ignored.**

This warning occurs, if the parameter SpiLevelDelivered is configured as 0 (SPI Level 0 Driver) and SpiInterruptibleSeqAllowed in the container SpiGeneral is configured as true. Hence value of the parameter SpiInterruptibleSeqAllowed in the container SpiGeneral is ignored.

**WRN083085: The parameter 'SpiHighPriorityHwSequence' in the container ‘SpiSequence’ should not be configured as <true>. Since the pre-compile parameter 'SpiHighPriorityHwHandlingEnable' in the ‘SpiGeneral’ container is configured as <false>. Hence the generation tool ignores the value configured for the parameter 'SpiHighPriorityHwSequence'.**

This warning occurs, if the value of the parameter SpiHighPriorityHwSequence configured in the container SpiSequence is not to be configured as true. And the parameter

SpiHighPriorityHwHandlingEnable in the container SpiGeneral should be false. On that moment Generation tool ignores the value configured for the parameter SpiHighPriorityHwSequence.

## 8.3 Information Messages

**INF083001: The value of the parameter 'SpiShiftClockIdleLevel' in the container 'SpiExternalDevice' configured is ignored since the value of parameter 'SpiHwUnit' present in the container 'SpiExternalDevice' is configured as <CSIGn>.**

This information occurs, if the value of parameter SpiHwUnit present in the container SpiExternalDevice is configured as CSIG<n> and the value of the parameter SpiShiftClockIdleLevel in the container SpiExternalDevice is configured. In this case the value of SpiShiftClockIdleLevel in the container SpiExternalDevice is ignored. Here <n> is integer number e.g. 0, 1, etc.

**INF083003: Calculated SPI baud rate for job 'SpiJob' in configuration set 'SpiDriver' should be equal to <Calculated Buadrate Hz>.**

This information occurs to provide the calculated SPI baud rate for job (SpiJob) in configuration set SpiDriver.
The calculation of baud rate is done as follows:

Baudrate = (Referred peripheral clock from MCU) /
[(2^m) * SpiBaudrateConfiguration * 2]

| SpiInputClockSelect | m |
|---|---|
| PCLK | 0 |
| PCLK_DIVBY_2 | 1 |
| PCLK_DIVBY_4 | 2 |
| PCLK_DIVBY_8 | 3 |
| PCLK_DIVBY_16 | 4 |
| PCLK_DIVBY_32 | 5 |
| PCLK_DIVBY_64 | 6 |

**INF083005: The parameters 'SpiCsIdleEnforcement', 'SpiCsIdleTiming', 'SpiCsHoldTiming', 'SpiCsInterDataDelay' and 'SpiCsSetupTime' from the container 'SpiExternalDevice' should not be configured since the parameter 'SpiHwUnit' present in the container 'SpiExternalDevice' is configured as <CSIGn>.**

This information occurs, if the parameters SpiCsIdleEnforcement, SpiCsIdleTiming, SpiCsHoldTiming, SpiCsInterDataDelay and SpiCsSetupTime are configured when the parameter SpiHwUnit in the container SpiExternalDevice is configured as CSIG<n>. Here <n> is integer number e.g. 0, 1, etc.

**INF083006: The HW unit <value of the parameter SpiSynchHwUnit> published in the parameter 'SpiSynchHwUnit' of the container**

**‘SpiCsig<m>/SpiCsih<n>’ is not configured as <SYNCHRONOUS> for any of the hardware units selected for jobs.**

This information occurs, if the value of the parameter SpiSynchHwUnit configured in the container SpiCsig<m> or SpiCsih<n> is not configured as SYNCHRONOUS for hardware units selected for any of the jobs. Here <m> and <n> are integer numbers e.g. 0, 1, etc.

**INF083008: The DMA trigger configured for hardware unit "CSIH1" mentioned in the parameter 'SpiDmaTrigCtrlOnCS' does not match with the hardware unit "CSIH0" of the parameter 'SpiDmaHwUnit' in the container 'SpiDma', hence the value configured for the parameter 'SpiDmaTrigCtrlOnCS' is ignored.**

This information occurs, if the hardware unit configured in the parameter SpiDmaTrigCtrlOnCS does not match with the hardware unit configured in the parameter SpiDmaHwUnit of SpiDma container.

# Chapter 9 Notes

“Generation Tool” and “Tool” terminologies are used interchangeably to refer SPI Driver Generation Tool.

## Revision History

| Sl.No. | Description | Version | Date |
|---|---|---|---|
| 1. | Initial Version | 1.0.0 | 24-Oct-2013 |
| 2. | Error message numbers updated. | 1.0.1 | 28-Jan-2014 |
| 3. | Error message ERR083093 and ERR083094 are updated and ERR083118 and ERR083119 are added. | 1.0.2 | 29-Apr-2014 |
| 4. | The information message INF083003 is updated for baud rate formula. | 1.0.3 | 12-May-2014 |
| 5. | 1. Parameter SpiReadBackConfiguration is removed from table of Error message ERR083004.<br>2. The information message INF083008 is added.<br>3. Parameter SpiLoopBackSelfTest is added in table of Error message ERR083004.<br>4. Error message ERR083119 is removed, INF083004 is made as WRN083084, ERR083072 is updated and ERR083121 is added.<br>5. INF083007 is made as WRN083085, Error message ERR083085 is reformulated and for ERR083084 table is added.<br>6. ERR083120 is added. | 1.0.4 | 23-Jul-2014 |
| 6. | 1. Error message ERR083118 is removed.<br>2. Description of error message ERR083041 is updated.<br>3. Reference Documents section is updated.<br>4. Chapter 4 remark section is updated.<br>5. Chapter 6 is updated for the precautions.<br>6. Parameter SpiLoopBackSelfTest is removed in table of Error message ERR083004.<br>7. Parameter SPI_E_SELF_TEST_FAILURE is removed from error messages ERR083093 and ERR083094. | 1.0.5 | 22-Oct-2014 |
| 7. | 1. Error messages ERR083005, ERR083018 and ERR083037 are rephrased. | 1.0.6 | 19-Nov-2014 |
| 8. | Following changes are made:<br><br>1. Updated section 2.1 ‘Reference Documents’ to correct the name and version of Parameter Definition Files.<br>2. Section 8.1 and Section 8.2 is modified for removing warning and adding error message ( WRN083001 to ERR083122) | 1.0.7 | 16-May-2015 |

# AUTOSAR MCAL R4.0.3 User's Manual
# SPI Driver Component Ver.1.0.7
# Generation Tool User's Manual

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