TRAVEO™ T2G family AUTOSAR MCAL SPI release notes

SRN223399 version 1.19

About this document

Scope and purpose

Thank you for your interest in the TRAVEO™ T2G family AUTOSAR MCAL SPI driver version 1.19. This document lists the installation requirements, software changes, limitations, and known issues.

Intended audience

This document is intended for anyone who uses the serial peripheral interface (SPI) driver of the TRAVEO™ T2G family.

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1 System requirements and recommendations

Software prerequisites	Supported version
EB tresos Studio package for Infineon	26.2.0

1.1 Supported compilers

Green Hills Software, compiler v2017.1.4

IAR Embedded Workbench 8.0, EWARM FS 8.22.3

1.2 Compiler options

This section summarizes the compiler options used to build and test the module. When changing the compiler options, the module must be considered untested.

Compiler	Option (Cortex®-M4F core)
Green Hills Software, compiler v2017.1.4	`-cpu=cortexm4f -thumb -thumb_lib -C99 --short_enum -align4 --no_commons --no_alternative_tokens -asm3g -preprocess_assembly_files -nostartfiles -globalcheck=normal -globalcheck_qualifiers --prototype_errors -Wformat -Wimplicit-int -Wshadow -Wtrigraphs -Wundef -reject_duplicates -c -list -Ospeed -OI -Olink -Ointerproc -Omax -fsingle`

Compiler	Option (Cortex®-M7 core)
Green Hills Software, compiler v2017.1.4	`-cpu=cortexm7 -thumb -thumb_lib -C99 --short_enum -align4 --no_commons --no_alternative_tokens -asm3g -preprocess_assembly_files -nostartfiles -globalcheck=normal -globalcheck_qualifiers --prototype_errors -Wformat -Wimplicit-int -Wshadow -Wtrigraphs -Wundef -reject_duplicates -c -list -Ospeed -OI -Olink -Ointerproc -Omax -fhard`

Compiler	Option (Cortex®-M4F core)
IAR Embedded Workbench 8.0, EWARM FS 8.22.3	`--debug --endian=little --cpu=Cortex-M4 -e --fpu=VFPv4_sp -Ohs --no_size_constraints`

Compiler	Option (Cortex®-M7 core)
IAR Embedded Workbench 8.0, EWARM FS 8.22.3	`--debug --endian=little --cpu=Cortex-M7 -e --fpu=VFPv5_d16 -Ohs --no_size_constraints`

1.3 Library compiler options

If a binary library has been delivered with this module, it has been built using the following options:

Compiler	Option (Cortex®-M4F core)
Green Hills Software, compiler v2017.1.4	`-cpu=cortexm4f -thumb -thumb_lib -C99 --short_enum -align4 --no_commons --no_alternative_tokens -asm3g -preprocess_assembly_files -nostartfiles -globalcheck=normal -globalcheck_qualifiers --prototype_errors -Wformat -Wimplicit-int -Wshadow -Wtrigraphs -Wundef -reject_duplicates -c -list -Ospeed -OI -Olink -Ointerproc -Omax -fsingle`

Compiler	Option (Cortex®-M7 core)
Green Hills Software, compiler v2017.1.4	`-cpu=cortexm7 -thumb -thumb_lib -C99 --short_enum -align4 --no_commons --no_alternative_tokens -asm3g -preprocess_assembly_files -nostartfiles -globalcheck=normal -globalcheck_qualifiers --prototype_errors -Wformat -Wimplicit-int -Wshadow -Wtrigraphs -Wundef -reject_duplicates -c -list -Ospeed -OI -Olink -Ointerproc -Omax -fhard`

Compiler	Option (Cortex®-M4F core)
IAR Embedded Workbench 8.0, EWARM FS 8.22.3	`--debug --endian=little --cpu=Cortex-M4 -e --fpu=VFPv4_sp -Ohs --no_size_constraints`

Compiler	Option (Cortex®-M7 core)
IAR Embedded Workbench 8.0, EWARM FS 8.22.3	`--debug --endian=little --cpu=Cortex-M7 -e --fpu=VFPv5_d16 -Ohs --no_size_constraints`

1.4 Memory consumption

GHS (Spi_lib) section	Size (in bytes)
.text	17472
.data	1
.bss	7
.rodata	8
Combined	17488

GHS (Spi_src) section	Size (in bytes)
.text	2826
.bss	444
.rodata	376
Combined	3646

IAR (Spi_lib) section	Size (in bytes)
.text	13988
.bss	5
.data	3
.rodata	3
Combined	13999

IAR (Spi_src) section	Size (in bytes)
.text	2584
.bss	444
.rodata	320
Combined	3348

Note: *The memory consumption of *_src.lib depends on the configuration.*

Note: *The listed memory consumption will vary depending on customer configuration.*

Explanatory notes for this section

Section	Description
.text	Program code
.data	Variables with explicitly initialized values
.bss	Variables that are not explicitly initialized
.rodata	Read-only data

1.5 Stack consumption

1.5.1 Green Hills Software

Function	Max stack usage (in bytes)
`Spi_Init`	180
`Spi_DeInit`	104
`Spi_WriteIB`	56
`Spi_AsyncTransmit`	180
`Spi_ReadIB`	28
`Spi_SetupEB`	40
`Spi_GetStatus`	20
`Spi_GetJobResult`	20
`Spi_GetSequenceResult`	20
`Spi_GetVersionInfo`	20
`Spi_SyncTransmit`	328
`Spi_GetHWUnitStatus`	24
`Spi_Cancel`	20

Function	Max stack usage (in bytes)
Spi_SetAsyncMode	44
Spi_GetBufferStatus	52
Spi_MainFunction_Handling	236
Spi_Terminate	228
Spi_ChangeOvsSetting	24
Spi_Interrupt_SCB0_Cat1	232
Spi_Interrupt_SCB0_Cat2	232
Spi_Interrupt_SCB1_Cat1	232
Spi_Interrupt_SCB1_Cat2	232
Spi_Interrupt_DMA_CH8_Isr_Cat1	232
Spi_Interrupt_DMA_CH8_Isr_Cat2	232
Spi_Interrupt_DMA_CH9_Isr_Cat1	232
Spi_Interrupt_DMA_CH9_Isr_Cat2	232

Note: *Stack consumption has been evaluated using the gstack utility program, which is part of the Green Hills release package. To enable the measurement of stack consumption in your project, build the source code according to the instructions given in the "Measuring Stack Consumption" section of the module's user guide.*

Note: *The listed stack consumption will vary depending on customer configuration.*

Note: *The GHS stack consumption listed in the release notes was measured using the additional compile option "-gs". The GHS compiler cannot measure stack consumption for the selected optimization level (see compilation options). Green Hills cannot exclude possible effects of "-gs" on optimization and stack consumption. Therefore, Infineon cannot guarantee the accuracy of these values. For more information on measuring GHS stack consumption, see the section gstack utility program in Build_arm.pdf.*

1.5.2 IAR Embedded Workbench

Function	Max stack usage (in bytes)
Spi_Init	104
Spi_DeInit	72
Spi_WriteIB	52
Spi_AsyncTransmit	144
Spi_ReadIB	32
Spi_SetupEB	96
Spi_GetStatus	24
Spi_GetJobResult	32
Spi_GetSequenceResult	32
Spi_GetVersionInfo	16
Spi_SyncTransmit	272
Spi_GetHWUnitStatus	24

Function	Max stack usage (in bytes)
Spi_Cancel	16
Spi_SetAsyncMode	48
Spi_GetBufferStatus	52
Spi_MainFunction_Handling	232
Spi_Terminate	192
Spi_ChangeOvsSetting	32
Spi_Interrupt_SCB0_Cat1	224
Spi_Interrupt_SCB0_Cat2	224
Spi_Interrupt_SCB1_Cat1	224
Spi_Interrupt_SCB1_Cat2	224
Spi_Interrupt_DMA_CH8_Isr_Cat1	224
Spi_Interrupt_DMA_CH8_Isr_Cat2	224
Spi_Interrupt_DMA_CH9_Isr_Cat1	224
Spi_Interrupt_DMA_CH9_Isr_Cat2	224

Note: *To enable the measurement of stack consumption in your project, build the source code with the linker option "`--enable_stack_usage --log call_graph`". See stack usage analysis of the IAR C/C++ development guide for details.*

Note: *The listed stack consumption will vary depending on customer configuration.*

1.6 Note on "*_Bswmd.arxml"

Note that the <*Module*>*_Bswmd.arxml* files are templates that can be freely modified by the customer or RTE vendor.

These are in the *output\generated\swcd* subfolder of your project folder.

Named files are not tested.

1.7 Release details

Module software version
1.19.x (x=software patch version; see the delivery notes for details)

AUTOSAR specification version (ASR)
4.2.2

Target
MXS40

MCAL configuration settings	Supported derivatives
See the resource release notes	See the resource release notes

Corresponding Spi_MemMap.h stub file version
1.0.1

2 Installation

See the installation manual for EB tresos Studio for INFINEON AUTOSAR software products and installation manual for MCAL42-TRAVEO.

3 Deviations from AUTOSAR

T2MC-3007 - Behaviour of EB channels

Title: Behaviour of EB channels
Description: [SWS_Spi_00280] [The buffer provided by the application for the SPI Handler Driver may have a different size.] ()

Reason for rejection: This requirement is irrelevant for the SPI driver development because it is in the responsibility of the user.

T2MC-3050 - LEVEL 2, Enhanced behaviour

Title: LEVEL 2, Enhanced behaviour

Description: [SWS_Spi_00131] [Jobs associated with the prearranged SPI bus shall not belong to Sequences containing Jobs associated with another SPI bus. In other words, mixed Sequences (synchronous with asynchronous Jobs) shall not be allowed.] ()

Reason for rejection: `Spi_SyncTransmit` and `Spi_AsyncTransmit` accept any sequence, independently of sync/async setting of jobs.

T2MC-3053 - LEVEL 2, Enhanced behaviour

Title: LEVEL 2, Enhanced behaviour

Description: [SWS_Spi_00140] [If SpiHwUnitSynchronous is set to "Synchronous" for a job, the associated bus defined by SpiHwUnit behave same as prearranged bus. It means that all requirements valid for prearranged bus will be valid also for the bus assigned to this job.] ()

Reason for rejection: There is no prearranged synchronous bus. The SPI driver allows every bus in synchronous or asynchronous manner according to its configuration, independently of whether it is transferred synchronously or asynchronously.

T2MC-3048 - LEVEL 2, Enhanced behaviour

Title: LEVEL 2, Enhanced behaviour

Description: [SWS_Spi_00130] [The so-called synchronous Sequences shall only be composed of Jobs that are associated to the prearranged SPI bus. These Sequences shall be used with synchronous services[3] only.] ()

Reason for rejection: No prearranged SPI busses are used.

T2MC-3015 - LEVEL0, Simple synchronous behaviour

Title: LEVEL0, Simple synchronous behaviour

Description: [SWS_Spi_00084] [If different Jobs (and consequently also Sequences) have common Channels, the SPI Handler/Driver' environment shall ensure that read and/or write functions are not called during transmission.] (SRS_Spi_12170)

Reason for rejection: This is out of the scope of the SPI handler driver. The user shall take care about prevention of overwriting common used channels.

T2MC-3503 - Not applicable requirements

Title: Not applicable requirements

Description: [SWS_Spi_00999] [These requirements are not applicable to this specification.] (SRS_BSW_00301, SRS_BSW_00302, SRS_BSW_00306, SRS_BSW_00307, SRS_BSW_00308, SRS_BSW_00309, SRS_BSW_00312, BSW00324, SRS_BSW_00325, SRS_BSW_00326, SRS_BSW_00328, SRS_BSW_00330, SRS_BSW_00331, SRS_BSW_00334, SRS_BSW_00341, SRS_BSW_00342, SRS_BSW_00343, SRS_BSW_00347, SRS_BSW_00355, SRS_BSW_00375, SRS_BSW_00399, SRS_BSW_00400, SRS_BSW_00401, SRS_BSW_00413, SRS_BSW_00416, SRS_BSW_00417, BSW00420, SRS_BSW_00422, SRS_BSW_00423, SRS_BSW_00424, SRS_BSW_00426, SRS_BSW_00427, SRS_BSW_00428, SRS_BSW_00429, BSW00431, SRS_BSW_00432, SRS_BSW_00433, BSW00434, SRS_BSW_00005, SRS_BSW_00006, SRS_BSW_00009, SRS_BSW_00010, SRS_BSW_00161, SRS_BSW_00164, SRS_BSW_00168, SRS_BSW_00170, SRS_BSW_00172, SRS_SPAL_12267, SRS_SPAL_12068, SRS_SPAL_12069, SRS_SPAL_12063, SRS_SPAL_12129, SRS_SPAL_12067, SRS_SPAL_12077, SRS_SPAL_12078, SRS_SPAL_12092, SRS_SPAL_12265)

Reason for rejection: Named RQMs are not applicable.

T2MC-3059 - Scheduling advices

Title: Scheduling advices

Description: [SWS_Spi_00271] [In case call end notification function and rescheduling are fully done by hardware, the order could not be configured as required; the order shall be completely documented.] ()

Reason for rejection: HW does not support scheduling.

T2MC-3360 – Variants

Title: Variants

Description: [SWS_Spi_00148] [VARIANT-POST-BUILD: Parameters with "Pre-compile time", "Link time" and "Post-build time" are allowed in this variant.] (SRS_BSW_00404, SRS_BSW_00405)

Reason for rejection: Link-time variant is not supported.

T2MC-3359 – Variants

Title: Variants

Description: [SWS_Spi_00076] [VARIANT-LINK-TIME: Only parameters with "Pre-compile time" and "Link time" are allowed in this variant.] (SRS_BSW_00396, SRS_BSW_00398, SRS_BSW_00405, SRS_SPAL_12263)

Reason for rejection: Link-time variant is not supported.

T2MC-3094 - { OBSOLETE } Debugging

Title: { OBSOLETE } Debugging

Description: [SWS_Spi_00367] { OBSOLETE } [The states SPI_UNINIT, SPI_IDLE, SPI_BUSY shall be available for debugging.] ()

Reason for rejection: Common / uniform / standardized debugging from AUTOSAR not supported.

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4 Limitations

T2MC-97519 - [SPI] AUTOSAR C implementation rules

Title: [SPI] AUTOSAR C implementation rules

Description: The MCAL modules shall fulfill all design and implementation guidelines as described in specification of C implementation rules AUTOSAR_TR_CImplementationRules.pdf.

Limitation: Out of scope: keyword macros 'CONST' and 'VAR' are not required for declaration/definition of the local variable, function parameter, and structure/union fields.

T2MC-3097 - Imported types

Title: Imported types

Description: [SWS_Spi_00174] ⌈ Dem_EventIdType shall be imported from Dem_Types.h.⌋ (SRS_BSW_00357)

Limitation: The SPI handler/driver module is not affected by the choice of file in which `Dem_EventIdType` is defined. It is sufficient for `Dem_EventIdType` to be imported through *Dem.h*.

T2MC-3046 - LEVEL 2, Enhanced behaviour

Title: LEVEL 2, Enhanced behaviour

Description: [SWS_Spi_00128] ⌈ The LEVEL 2 SPI Handler/Driver shall offer a synchronous transfer service for all SPI HW units configured as synchronous and it shall also offer an asynchronous transfer service for all other SPI buses.⌋ ()

Limitation: Synchronous and asynchronous transmissions need to be separated. The separation can be achieved either by using hardware units for synchronous transfer that are different from for asynchronous transfer or by temporal separation i.e., do not transfer synchronously and asynchronously on the same HW unit at the same time.

T2MC-3090 - SPI state checking

Title: SPI state checking

Description: [SWS_Spi_00046] ⌈ If default error detection for the SPI module is enabled and the SPI Handler/Driver's environment calls any API function before initialization, an error should be reported to the DET with the error value SPI_E_UNINIT according to the configuration.⌋ (SRS_BSW_00406)

Limitation: `Spi_Init` and `Spi_GetVersionInfo` allow normal operation (i.e., no error is detected) when the module is not initialized.

T2MC-3225 - Spi_SetupEB

Title: `Spi_SetupEB`

Description: [SWS_Spi_00180] ⌈ Std_ReturnType `Spi_SetupEB`(Spi_ChannelType Channel, const Spi_DataBufferType* SrcDataBufferPtr, Spi_DataBufferType* DesDataBufferPtr, Spi_NumberOfDataType Length)

Service name:	`Spi_SetupEB`
Syntax:	Std_ReturnType `Spi_SetupEB`(

	Spi_ChannelType Channel, const Spi_DataBufferType* SrcDataBufferPtr, Spi_DataBufferType* DesDataBufferPtr, Spi_NumberOfDataType Length)	
Service ID[hex]:	0x05	
Sync/Async:	Synchronous	
Reentrancy:	Reentrant	
Parameters (in):	Channel	Channel ID.
	SrcDataBufferPtr	Pointer to source data buffer.
	DesDataBufferPtr	Pointer to destination data buffer in RAM.
	Length	Length (number of data elements) of the data to be transmitted from SrcDataBufferPtr and/or received from DesDataBufferPtr Min.: 1 Max.: Max of data specified at configuration for this channel
Parameters (in-out):	None	
Parameters (out):	None	
Return value:	Std_ReturnType	E_OK: Setup command has been accepted E_NOT_OK: Setup command has not been accepted
Description:	Service to setup the buffers and the length of data for the EB SPI Handler/Driver Channel specified.	

] ()

Limitation: `SrcDataBufferPtr` and `DesDataBufferPtr` must be aligned according to the data width of the given channel (`SpiDataWidth`). If `SpiDataWidth` is in range [4..8], there is no limitation on buffer alignment. If `SpiDataWidth` is in the range [9..16], the buffer addresses must be a multiple of 2. If `SpiDataWidth` is greater than 16, the buffer addresses must be a multiple of 4. In case of unaligned buffers, the development error SPI_E_PARAM_POINTER is reported.

T2MC-3409 – SpiBaudrate

Title: SpiBaudrate

Description:

SWS Item	ECUC_Spi_00208:		
Name	SpiBaudrate		
Description	This parameter is the communication baudrate - This parameter allows using a range of values, from the point of view of configuration tools, from Hz up to MHz.		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	0 .. INF		
Default value	--		
Post-Build Variant Value	True		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE

	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: The assignable value is limited as follows: clk/4, clk/5. ..., clk/16 clk : The peripheral clock (input clock to SCB unit).

T2MC-3389 - SpiChannelId

Title: SpiChannelId

Description:

SWS Item	ECUC_Spi_00200:		
Name	SpiChannelId		
Description	SPI Channel ID, used as parameter in SPI API functions.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 255		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

Limitation: The value range is 0 to 254, unique, zero-based, and consecutive.

T2MC-3398 – SpiChannelIndex

Title: SpiChannelIndex

Description:

SWS Item	ECUC_Spi_00234:		
Name	SpiChannelIndex		
Description	This parameter specifies the order of Channels within the Job.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: The value range is limited to 0 … 254.

T2MC-3412 – SpiCsSelection

Title: SpiCsSelection

Description:

SWS Item	ECUC_Spi_00239:		
Name	SpiCsSelection		
Description	When the Chip select handling is enabled (see SpiEnableCs), then this parameter specifies if the chip select is handled automatically by Peripheral HW engine or via general purpose IO by Spi driver.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	CS_VIA_GPIO	chip select handled via gpio by Spi driver.	
	CS_VIA_PERIPHERAL_ENGINE	chip select is handled automatically by Peripheral HW engine.	
Default value	CS_VIA_PERIPHERAL_ENGINE		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: SpiEnableCs		

Limitation: When CS_VIA_PERIPHERAL_ENGINE (hardware CS) is selected, the width of data of all channels that belong to the job should be the same.

T2MC-3391 – SpiDataWidth

Title: SpiDataWidth

Description:

SWS Item	ECUC_Spi_00202:
Name	SpiDataWidth
Description	This parameter is the width of a transmitted data unit.
Multiplicity	1
Type	EcucIntegerParamDef

Range	1 .. 32		
Default value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: The range is limited from 4 to 32. When hardware CS is selected, the width of data of all channels that belong to the job should be the same.

T2MC-3372 – SpiDevErrorDetect

Title: SpiDevErrorDetect

Description:

SWS Item	ECUC_Spi_00228:		
Name	SpiDevErrorDetect		
Description	Switches the Default Error Tracer (Det) detection and notification ON or OFF. - true: enabled (ON). - false: disabled (OFF).		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

Limitation: Setting this parameter to 'false' will disable notification of development errors via DET. However, in contrast to AUTOSAR specification, detection of development errors is still enabled and errors will be reported via `SpiErrorCalloutFunction`.

T2MC-3393 – SpiEbMaxLength

Title: SpiEbMaxLength

Description:

SWS Item	ECUC_Spi_00204:
Name	SpiEbMaxLength
Description	This parameter contains the maximum size (number of data elements) of data buffers in case of EB Channels and only.
Multiplicity	1
Type	EcucIntegerParamDef

Range	0 .. 65535		
Default value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: The SPI_CHANNEL_TYPE parameter has to be configured as EB for this Channel. The SPI_CHANNEL_BUFFERS_ALLOWED parameter has to be configured as 1 or 2.		

Limitation: Configuration of a minimum length of 0 is not allowed; the length must be at least 1. According to `SWS_Spi_00180`, it is not possible to use buffers of length 0.

T2MC-3394 – SpiIbNBuffers

Title: SpiIbNBuffers

Description:

SWS Item	ECUC_Spi_00205:		
Name	SpiIbNBuffers		
Description	This parameter contains the maximum number of data buffers in case of IB Channels and only.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: The SPI_CHANNEL_TYPE parameter has to be configured as IB for this Channel. The SPI_CHANNEL_BUFFERS_ALLOWED parameter has to be configured as 0 or 2.		

Limitation: Configuration of a minimum length of 0 is not allowed; the length must be at least 1. According to `SWS_Spi_00018`, it is not possible to use buffers of length 0. Maximum length can be different according to `SpiDataWidth`. The maximum length is 65535 if `SpiDataWidth` is 8 bits or less, 32767 if `SpiDataWidth` is 9 bits to 16 bits, and 16383 if `SpiDataWidth` is 17 bits or more.

T2MC-3404 – SpiJobId

Title: SpiJobId

Description:

SWS Item	ECUC_Spi_00219:		
Name	SpiJobId		
Description	SPI Job ID, used as parameter in SPI API functions.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

Limitation: The value range is 0 to 65534, unique, zero-based, and consecutive.

T2MC-3385 – SpiSequenceId

Title: SpiSequenceId

Description:

SWS Item	ECUC_Spi_00224:		
Name	SpiSequenceId		
Description	SPI Sequence ID, used as parameter in SPI API functions.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 255		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: ECU		

Limitation: The value range is 0 to 254, unique, zero-based, and consecutive.

T2MC-3417 - SpiTimeClk2Cs

Title: SpiTimeClk2Cs

Description:

SWS Item	ECUC_Spi_00214:		
Name	SpiTimeClk2Cs		
Description	Timing between clock and chip select (in seconds) - This parameter allows to use a range of values from 0 up to 0.0001 seconds. The real configuration-value used in software BSW-SPI is calculated out of this by the generator-tools		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	0 .. 1E-4		
Default value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: `SpiTimeClk` 2 Cs is not referenced. Instead, the original parameters `SpiSetupDelay` and `SpiHoldDelay` are referenced, but their values are limited. If hardware CS is not selected, these parameters are not referenced.

5 Known defects

The listed issues were known at the day this release note was generated. Further problems may have been discovered in the meantime. For an up-to-date list of known issues, contact your Infineon sales representative.

This release has no known issues at the time of release.

6 Documentation

All user guides for MCAL drivers are in the *doc* subdirectory of the *installation* directory. The default location is:

C:\INFINEON_ESDB\Tresos26_2_0\doc

7 Technical support

If you have questions related to the driver, contact the local support application engineer.

8 Version history

8.1 Module SW-Version 1.3

Initial module setup.

8.2 Module SW-Version 1.4

T2MC-38119 - [ADC, SPI] Problems in some *arxml* files

Title: [ADC, SPI] Problems in some *arxml* files

Description: The following code is implemented in the *arxml* file (i.e. *Adc_Bswmd.arxml* and *Spi_Bswmd.arxml*).
However, the code does not work correctly because the relative path is not available in tresos Studio.
The absolute path should be used instead.
Adc_Bswmd.arxml:
[!INCLUDE "../../../Adc_TS_T40D13M1I0R0/generate/include/Adc_Macros.m"!][!//
Spi_Bswmd.arxml:
[!INCLUDE "../../../Spi_TS_T40D13M1I0R0/generate/include/Spi_Macros.m"!][!//
[!INCLUDE "../../../Spi_TS_T40D13M1I0R0/generate/include/Spi_Macros_Der.m"!][!//

Workaround:
Replace the relative path with the absolute path below:
Adc_Bswmd.arxml:
[!INCLUDE "?concat($pluginPath,'\generate\include\Adc_Macros.m')"!][!//
Spi_Bswmd.arxml:
[!INCLUDE "?concat($pluginPath,'\generate\include\Spi_Macros.m')"!][!//
[!INCLUDE "?concat($pluginPath,'\generate\include\Spi_Macros_Der.m')"!][!//

T2MC-39176 - [All] Correcting vendor-specific module definition

Title: [All] Correcting vendor-specific module definition

Description: The following rules should be followed in the vendor-specific module definition.

- The multiplicity of each AUTOSAR parameter, reference and container is not correctly derived.
- The DEFAULT-VALUE of each parameter is not valid.
- If the target of DESTINATION-REF is not the standard AUTOSAR container, the reference should not start with '/AUTOSAR/EcucDefs/'.

T2MC-38103 - [SPI] Accurate baud rate is not displayed in EB tresos Studio GUI

Title: [SPI] Accurate baud rate is not displayed in EB tresos Studio GUI

Description: Even when clicking the SpiBaudate calculation button, the accurate baud rate closest to the input value is not displayed and the smallest baud rate that can be set is displayed.

T2MC-38108 - [SPI] In the level 2 driver, DMA is used in synchronous transfer

Title: [SPI] In the level 2 driver, DMA is used in synchronous transfer

Description: In the level 2 driver, if synchronous transfer is performed to an external device that is set to use DMA, transfer using DMA is performed. Originally, in synchronous transfer, it is necessary not to use DMA regardless of whether or not to use the DMA of the external device.

T2MC-38074 - File extension should be changed from .bmd to .arxml

Title: File extension should be changed from .bmd to .arxml

Description: The file extension should be changed from *.bmd to *.arxml.
Each module still has an autosar/<module>.bmd file.

8.3 Module SW-Version 1.5

T2MC-39747 - [All] Checking for valid C function name and including filename in configuration parameters

Title: [All] Checking for valid C function name and including filename in configuration parameters

Description: Checking for valid C function name:
Check all configuration parameters related to the function name to see if it is a valid C function name.
A part of parameters are not checked.
If an invalid function name is set, a compile error will occur during the build process, which is inconvenient for users.
Therefore, it is better to check whether the configured function names are valid C function names in advance (i.e. during configuration phase).

Checking for valid filename:
Check all configuration parameters related to the file name to see if it is valid.
A part of parameters cannot check the fact that empty file name (i.e. ".h") is wrong.
If an invalid file name is set, a compile error will occur during the build process, which is inconvenient for users.
Therefore, it is better, to check in advance, whether the configured file names are valid.

This CR is intended to solve the inconvenience.

T2MC-41850 - [General] <CODE-DESCRIPTORS> Node should be added to the *arxml* files of all modules

Title: [General] <CODE-DESCRIPTORS> Node should be added to the *arxml* files of all modules

Description: For all modules, the <CODE-DESCRIPTORS> Node needs to be added for the RTE within the BSWMD *arxml* file.

T2MC-43574 - [SPI] Change SpiMaxHwUnit in SpiPublishedInformation

Title: [SPI] Change SpiMaxHwUnit in SpiPublishedInformation

Description: Since the number of SCB units of TRAVEO™ T2G-B-E-1M was 8, SpiMax HuUnit's DEFAULT in SpiPublishedInformation is a fixed value of 8. However, since the number of SCB units of TRAVEO™ T2G-B-H-8M is 11, it is necessary to change DEFAULT of SpiMaxHuUnit.

T2MC-43548 - [SPI] Support of D-TCM area in asynchronous transfer using DMA

Title: [SPI] Support of D-TCM area in asynchronous transfer using DMA

Description: TRAVEO™ T2G-B-H-8M has two M7 cores, each with a D-TCM memory.

When accessing the D-TCM from the CPU, access is made with an address starting from 0x20000000. However, DMA cannot access D-TCM using this address.

To access D-TCM from DMA, an address starting from 0xA0010000 is required for D-TCM of core #0, and an address starting from 0xA0010000 is required for D-TCM of core #1.

Therefore, when the address of the buffer used by asynchronous transfer using DMA belongs to the area starting from 0x20000000, it is necessary to convert those addresses into addresses accessible by the DMA

8.4 Module SW-Version 1.6

T2MC-50519 - [General] Export issue with MCAL ES10_20180308

Title: [General] Export issue with MCAL ES10_20180308

Description: An example of the issue is described below.
The configuration exported from Tresos does not correspond to the real configuration shown in Tresos. See the attached example.
The issue concerns other modules too, not only the port described in attached pdf file.

T2MC-47967 - [SPI] Different baudrate not allowed on the same SCB unit

Title: [SPI] Different baudrate not allowed on the same SCB unit

Description: Currently, setting a different baud rate to ExternlDevice having the same SCB unit results in an error. Likewise, the use of DMA also causes an error.
If it is a different ExternlDevice, different settings for baud rate and DMA use should be possible even for the same SCB unit.

T2MC-43037 - [SPI] Different channel width not allowed on the same job

Title: [SPI] Different channel width not allowed on the same job

Description: According to the AUTOSAR specification, the channels part of the same job has their own set of characteristics.
Having the same transfer size for the channels that are part of the same job does not follow this philosophy and is against the AR specification.

T2MC-50612 - [General] Delete device-dependent information from the user guide

Title: [General] Delete device-dependent information from the user guide

Description: Any device-dependent information should not be included in the user guide.
Therefore, delete the datasheet name from the related documentation in the user guide.

T2MC-55275 - [SPI] Problem with absolute path in SPI generators

Title: [SPI] Problem with absolute path in SPI generators

Description: For the 8M MCAL integration we had a problem with the SPI generator files.
They contained absolute file paths for the .m file inclusions.

T2MC-56689 - [SPI] Spi_Job_SetChannelIndex function call with inappropriate arguments

Title: [SPI] Spi_Job_SetChannelIndex function call with inappropriate arguments

Description: Calling with specifying RxChannelIndex as the second argument, calling with specifying TxChannelIndex.

During normal operation, since RxChannelIndex and TxChannelIndex have the same value, there is no problem in actual operation.

Since it is not a correct description, correct it.

8.5 Module SW-Version 1.7

T2MC-59631 - [SPI] Warning message with AMDC 1.0.17

Title: [SPI] Warning message with AMDC 1.0.17

Description: The following warning message was displayed after updating AMDC to version 1.0.17.

Warning;Spi_Merged.arxml;nobody;Rule A205: Parameter 'Spi/SpiGeneral/SpiIncludeFile' has no multiplicity config class entry for VARIANT_POST_BUILD.;

Warning;Spi_Merged.arxml;nobody;Rule A205: Parameter 'Spi/SpiGeneral/SpiIncludeFile' has no value config class entry for VARIANT_PRE_COMPILE.;

8.6 Module SW-Version 1.8

T2MC-65913 - [SPI] Exclusive area exceeds 40us

Title: [SPI] Exclusive area exceeds 40us

Description: The duration of exclusive area of Spi_Interrupt_SCB0_Cat1 exceeds 40 us. It takes 55 us in the best condition.

T2MC-65910 - [SPI] Extra reception interrupt generation in asynchronous transfer

Title: [SPI] Extra reception interrupt generation in asynchronous transfer

Description: Asynchronous transfer without using DMA and using more data than the trigger interrupt level of the receive FIFO will correctly transmit and receive data, but an extra receive interrupt will be detected.

T2MC-68247 - [SPI] SpiEnableCs=True and SpiCsSelection multiplicity=0 must not be allowed

Title: [SPI] SpiEnableCs=True and SpiCsSelection multiplicity=0 must not be allowed

Description: Per Autosar the combination of SpiEnableCs=True and SpiCsSelection multiplicity=0 is not allowed.

ECUC_Spi_00239.

T2MC-68251 - [SPI] Different parameter settings are not allowed on the same SCB with different chip select

Title: [SPI] Different parameter settings are not allowed on the same SCB with different chip select

Description: Different settings of the following parameters are not allowed on the same SCB unit with different chip select.

SpiDataShiftEdge, SpiShiftClockIdleLevel, SpiCsPolarity, SpiSetupDelay, and SpiDeselect

Customer want to connect different devices with different characteristics (SpiCsPolarity, SpiShiftClockIdleLevel, SpiSetupDelay, and SpiHoldDelay) to the same SCB unit.

Therefore, when the same SCB unit has different chip select, it is necessary to enable different setting of these parameters.

T2MC-77594 – Support IAR compiler

Title: Support IAR compiler

Description: Support IAR compiler (IAR EWARM FS 8.22.3.15992).

8.7 Module SW-Version 1.10

T2MC-73208 - Request to stop disabling SCB module after every transmission

Title: Request to stop disabling SCB module after every transmission

Description: Current MCAL disables the SCB module after every transmission in SPI master mode. This makes the communication port into High-Z state between each transmission. Because the slave does not accept a High-Z input and CS becomes LOW (active) gradually even though there is no communication, which violates the standard, SPI master should drive the output ports (CS, CLK, MOSI) between the transmissions.

Make the changes to not disable the SCB module after every transmission. However, do this only when a configuration change is needed.

8.8 Module SW-Version 1.11

T2MC-91424 - [SPI] Spi.xdm is inconsistent with Spi.arxml

Title: [SPI] Spi.xdm is inconsistent with Spi.arxml

Description: There are some inconsistencies between *Spi.xdm* and *Spi.arxml* in the following definitions:

- SpiForceOverwrite has different UUIDs in *Spi.xdm* and *Spi.arxml*.
  => The value of SpiForceOverwrite's UUID in *Spi.arxml* will be changed.
- The description of SpiMaxHwUnit is different in Spi.xdm and Spi.arxml.
  => The description of SpiMaxHwUnit in Spi.arxml will be changed.
- SPI_EcuParameterDefinition has no UUID in Spi.xdm.
- LOWER-MULTIPLICITY of the SpiDmaChannelRx, SpiDmaChannelTx parameters in Spi.arxml should be 0.

=> LOWER-MULTIPLICITY of those parameters in *Spi.arxml* will be changed to 0. mclass tags will be added to these parameters in *Spi.xdm*.

- POST-BUILD-VARIANT-MULTIPLICITY of the following parameters in Spi.arxml should be true:
  SpiChannel, SpiExternalDevice, SpiJob, SpiChannelList, SpiSequence
  => POST-BUILD-VARIANT-MULTIPLICITY of these parameters will be changed to true.
  POSTBUILDVARIANTMULTIPLICITY will be added to these parameters in *Spi.xdm*.

8.9 Module SW-Version 1.12

T2MC-97132 - [SPI] Miswriting variable names in Spi_PBCfg

Title: [SPI] Miswriting variable names in Spi_PBCfg

Description: The variable name CpuM7_1Ptese in the generated code is incorrect.
Because of typos, the following constants are not be generated correctly.
SPI_SYNCTRANSMIT_TIMEOUT, SPI_CSACTIVE_TIMEOUT, SPI_CSINACTIVE_TIMEOUT

Spi_PBCfg.c

False:CpuM7_1Ptese
True:CpuM7_1Present

T2MC-97134 - [SPI] Unnecessary Extern description in SPI

Title: [SPI] Unnecessary Extern description in SPI

Description: Extern description of Spi_ReadIB () in Spi.c is unnecessary.
Spi.c
L190 extern FUNC(Std_ReturnType, SPI_CODE) Spi_ReadIB
L191 (
L192 VAR(Spi_ChannelType, AUTOMATIC) Channel,
L193 P2VAR(Spi_DataBufferType, AUTOMATIC, AUTOMATIC) DataBufferPointer
L194)
L195
{ … L261 return RetVal; L262 }

T2MC-97135 - [SPI] Unnecessary members in unnecessary function

Title: [SPI] Unnecessary members in unnecessary function

Description: In the type declaration of Spi_ConfigType, the members of "QueItemMax" are defined, but the initializers of Spi_Config[] are not enough to initialize the members of "QueItemMax".

T2MC-97136 - [SPI] Unused member existence in Spi_HwInfoType

Title: [SPI] Unused member existence in Spi_HwInfoType

Description: The following member of the variable are assigned, but there are no places where they are read.
Spi_HwInfo[].BufferPosStoredForSend

T2MC-97133 - [SPI] Wrong SpiSetupDelay configuration value is displayed on tresos

Title: [SPI] Wrong SpiSetupDelay configuration value is displayed on tresos

Description: Wrong SpiSetupDelay configuration value is displayed on tresos
file: Spi.xdm
Line: 662

True;
SpiDataShiftEdge=LEADING(CPHA=0): SetupDelay=0.75(SSEL_SETUP_DEL=0) or 1.75(SSEL_SETUP_DEL=1)
SpiDataShiftEdge=TRAILING(CPHA=1): SpiSetupDelay=0.25(SSEL_SETUP_DEL=0) or 1.25(SSEL_SETUP_DEL=1)

False:
SpiDataShiftEdge=LEADING(CPHA=0): SpiSetupDelay=0.25(SSEL_SETUP_DEL=0) or 1.25(SSEL_SETUP_DEL=1)
SpiDataShiftEdge=TRAILING(CPHA=1): SpiSetupDelay=0.75(SSEL_SETUP_DEL=0) or 1.75(SSEL_SETUP_DEL=1)

T2MC-96771 - Some memory placement restrictions are not mentioned in the user guide

Title: Some memory placement restrictions are not mentioned in the user guide

Description: Modules that work with other bus masters such as DW should have restrictions on memory placement.

However, there is insufficient information on these memory restrictions in the user guide. Add the restriction that tightly coupled memories (TCMs) do not support DMA to the user guide.

T2MC-97382 - Macro definition at variable declaration is missing and the limitation is not mentioned in release notes

Title: Macro definition at variable declaration is missing and the limitation is not mentioned in release notes

Description: Macro definitions are not used when declaring some variables and pointers (in FLS, MCU, PORT, SPI, and WDG).

According to AUTOSAR specification:
[SWS_COMPILER_00026]
#define VAR(vartype, memclass)

True:
volatile P2VAR(Spi_DmaChannelRegsType, AUTOMATIC, REGSPACE) retPtr;

False:
volatile Spi_DmaChannelRegsType * retPtr;

This issue is present in the following cases:

- All types of pointer declaration/definition are defined without macros.
  These contain the function parameter/global variable/local variable/structure field/union field.
- All types of function declaration/definition are defined without macros.
- When there is nested macro usage in function macros.
- Raw pointer is used in the function macro:
  e.g., FUNC(int *, memclass) function(void);

- Global variable or static variable in the function is not defined with macros.

To fully comply with the above cases, change variable and function definitions in FLS, MCU, PORT, SPI, and WDG.

In requirements, keyword macros 'CONST' and 'VAR' are not required for declaration/definition of the local variable, function parameter, and structure/union fields.
The information must be described in all release notes.

T2MC-96445 - SPI ISR execution time improvement

Title: SPI ISR execution time improvement

Description: The SPI ISR execution time need to improve according to the customer request.

T2MC-39519 - Support EB tresos V26.2.0

Title: Support EB tresos V26.2.0

Description: Support EB tresos V26.2.0

[Impact]
Strict AUTOSAR specification and check for parameter configuration errors are implemented in EB tresos V26.2.0.
In addition, handling of reference paths (relative paths) such as system description file (ARXML) is changed in EB tresos V26.2.0.

Therefore, if the current ECUC configuration definitions XML file contains deviations or errors, you may find errors during import to tresos26. In that case, the ECUC configuration definitions XML file must be modified appropriately.
In addition, if the current ARXML file contains unresolvable paths, you may find errors during import to tresos26. In that case, ARXML file must be modified.

The SW has been tested; no risks except for the low-level risk listed above were found.

8.10 Module SW-Version 1.13

T2MC-164778 - Support MISRA C:2012 coding rule

Title: Support MISRA C:2012 coding rule

Description: Support MISRA C:2012 coding rule.

The MISRA C:2012 coding rule checks the source code.

If a deviation from the rules is required, add the deviation comment to the code and report the result.

If a deviation is for MISRA-C:2004 only, remove the deviation comment.

8.11 Module SW-Version 1.14

T2MC-164831 - [ALL] Misleading comment in Module_MemMap.h

Title: [ALL] Misleading comment in Module_MemMap.h

Description: *{Mip}_MemMap.h* files are provided as sample template files. But, the file header comment cannot be modified, which is a contradiction. To resolve this contradiction, change the file header comment to allow user modification.
Also, to make sure that the file is not a part of the commercial product, move the *{Mip}_MemMap.h* files to the *MemMap* stub folder.

T2MC-165702 - [SPI] Adding concurrent sync transmit support for level 2 enhanced behavior

Title: [SPI] Adding concurrent sync transmit support for level 2 enhanced behavior

Description: SPI driver doesn't support concurrent sync transmit for level 2 enhanced behavior.

Add concurrent sync transmit support for level 2 enhanced behavior.

T2MC-165703 - [SPI] Improvement of Spi_GetBufferStatus function

Title: [SPI] Improvement of Spi_GetBufferStatus function

Description: Spi_GetBufferStatus returns the buffer position and the remaining data length without disabling the ISR. The buffer position is calculated using the remaining data length.

This guarantees the consistency of two return values without an impact on the ISR.

T2MC-166137 - [SPI] Improve how the completion of SyncTransmit is detected

Title: [SPI] Improve how the completion of SyncTransmit is detected

Description: Improve how the completion of transmission is detected to account for the worst-case condition with high load.

Although the Tx data is continuously written to the Tx FIFO and interrupts are disabled by software, the completion of transmission may be detected improperly if the writing operation is blocked for more than one data element time.

T2MC-166546 - [SPI] Improvement of the user guide

Title: [SPI] Improvement of the user guide

Description: Some description of the user guide is ambiguous. The description in the user guide needs to be improved to prevent misinterpretation.

- Improve the description conditions for using DMA.
  The DMA controller is used only for asynchronous transmission.
- Improve the description of following restriction:
  The restriction of sharing the same SCB with multiple external devices.

T2MC-105803 - [SPI] Improve SPI ISR execution time with static DMA descriptor

Title: [SPI] Improve SPI ISR execution time with static DMA descriptor

Description: The SPI ISR execution time needs to be improved according to the customer request.

Other minor improvements will be implemented if necessary.

8.12 Module SW-Version 1.15

T2MC-167372 - [SPI] AsyncTransmit failure with DMA and multiple SpiChannel

Title: [SPI] AsyncTransmit failure with DMA and multiple SpiChannel

Description: When SpiJob with multiple SpiChannels is transmitted by AsyncTransmit, the second and subsequent SpiChannels are not transmitted and the DMA transfer is interrupted.

8.13 Module SW-Version 1.16

T2MC-170294 - [SPI] Support non-contiguous SCB instance numbering for specific derivatives

Title: [SPI] Support non-contiguous SCB instance numbering for specific derivatives

Description: Support non-contiguous SCB instance numbering for specific derivatives.

Currently, interrupt handlers of the SCB are not generated correctly for derivatives with channels that are not contiguous numbers from 0.

Interrupt handlers are not generated correctly for derivatives with the following SCB channels, as specified in the example resource properties file:

SCB.instances:0,1,3,4,5,7 (There are no channels 2 and 6.)

Affected devices:

- TVII-B-E-512K
  All derivatives
- TVII-B-E-1M
  CYT2B73BAE, CYT2B73BAS, CYT2B73CAE, CYT2B73CAS
- TVII-B-E-2M
  CYT2B93BAE, CYT2B93BAS, CYT2B93CAE, CYT2B93CAS
- TVII-B-E-4M
  CYT2BL3BAE, CYT2BL3BAS, CYT2BL3CAE, CYT2BL3CAS

8.14 Module SW-Version 1.17

T2MC-170566 - [SPI] Improved FIFO clear processing when DMA is completed normally

Title: [SPI] Improved FIFO clear processing when DMA is completed normally

Description: When the DMA transfer is completed normally, the FIFO buffers are cleared before the next transfer. There is an issue in the clearing process, which clears the TX FIFO twice and does not clear the RX FIFO. However, when the transfer is completed normally, the FIFO will be empty same as that of being cleared. But, for functional safety, it is better to clear both TX FIFO and RX FIFO intentionally. As a horizontal check result, TX/RX FIFO clear processing is added to the initialization function.

T2MC-170565 - [SPI] Improved readability for internal function

Title: [SPI] Improved readability for internal function

Description: In the following functions for internal processing that refer to the configuration pointer, access by global variables and pointer access by arguments are mixed up:

```
FUNC(void, SPI_CODE) Spi_Hw_StartTransmit
(
 VAR(Spi_JobType, AUTOMATIC) Job,
 VAR(Spi_ChannelType, AUTOMATIC) Channel,
 P2CONST(Spi_ConfigType, AUTOMATIC, AUTOMATIC) ConfigPtr,
 VAR(Spi_HWUnitSyncType,
 AUTOMATIC) SyncType
)
```

For readability, the argument for the configuration pointer should be removed and should be accessed from global variables.

T2MC-170548 - [SPI] Interrupt status flag cleared at the end of interrupt processing

Title: [SPI] Interrupt status flag cleared at the end of interrupt processing

Description: The SPI interrupt function clears the interrupt flag after performing the interrupt processing. So, if an interrupt occurs during SCB RX interrupt processing, it is not processed. As a result, the two reception processing will be executed at the next interrupt. It should be improved to clear the factor at the beginning of the interrupt function to allow handling of SCB RX factors that occur during SCB interrupts.
As a horizontal check result, added countermeasure processing when TX FIFO becomes empty during SCB RX interrupt.

Functional impact:

As the processing time of one interrupt becomes longer, the TX FIFO may be detected as empty during the interrupt process. As a result, transmission may not be completed normally in case of only high load condition.

Work around:

- Use DMA (SpiUseDma=TRUE)
- Use data, which is 32 elements or less, for a job

T2MC-170775 - [SPI] Some parameters are inconsistent between XDM and ARXML

Title: [SPI] Some parameters are inconsistent between XDM and ARXML

Description: There are no DEFAULT parameters for SpiJobEndNotification and SpiSeqEndNotification in Spi.xdm. Add default parameters in Spi.xdm and unify the default values of Spi.xdm and Spi.arxml.

T2MC-170797 - [SPI] Need to guarantee the order of register settings between relevant peripherals for robustness

Title: [SPI] Need to guarantee the order of register settings between relevant peripherals for robustness

Description: If a driver controls different peripherals that have different bridges and buffers, then the order of access needs to be guaranteed.
It is also necessary to guarantee the order of CPU instruction and peripheral operations, if needed.

DW control and DIO control meet the above conditions regarding the SPI driver.
Therefore, the register read back process should be added.

Following is supported in release V1.10.0.

T2MC-172517 - Add a description on DeepSleep in the user guide

Title: Add a description on DeepSleep in the user guide

Description: Add a note on DeepSleep mode in the user guide.

T2MC-172674 - [SPI] Improve the user guide regarding the usage of Spi_SetupEB

Title: [SPI] Improv the user guide regarding the usage of Spi_SetupEB

Description: The following description of Spi_SetupEB(), in the user guide, is incomplete.

5.1.1.3 Externally Buffered Channels

Your application will call the Spi_SetupEB function before starting transmission.

For transmission of variable data lengths, it is necessary to update the buffer parameters via Spi_SetupEB before starting each new transmission. In case of constant data lengths, it is sufficient to call Spi_SetupEB once before the first transmission is initiated.

The description in the user guide must include the terms of use and precautions, so that you can use the function properly.

8.15 Module SW-Version 1.18

T2MC-172497 - [SPI] Modify the access to the NULL pointer address

Title: [SPI] Modify the access to the NULL pointer address

Description: There is a case where data that is not allocated to memory is accessed. So, the program should be modified, so that it does not access the data that is not allocated to memory.

This issue occurs if the Spi_GetBufferStatus() API, called with the SpiChannel parameter, has NULL pointer to the Tx/Rx buffer. The Spi_GetBufferStatus() API returns the status of the SpiChannel buffer. Even if the Tx/Rx buffer pointer of the specified SpiChannel is a NULL pointer, this API will access the address.

The illegal cases detected in the horizontal expansion of the above issue will also be modified.

The same issue occurs in the following cases:

1. If the Spi_ChangeOvsSetting() API is called with an argument of SpiExternalDevice, which is not assigned the SpiJob.
2. If an unexpected interrupt occurs during asynchronous transmission and the interrupt factor reset process is added.
3. If an interrupt occurs when the SPI driver is uninitialized and the interrupt factor reset process is added.

Also, modified the typo in the source code comment and in the error message of configuration.

Following are supported in release V1.12.0.

T2MC-178688 - Addition of the notice for Arm® errata and workaround in the user guide

Title: Addition of the notice for Arm® errata and workaround in the user guide

Description: Add a notice for Arm® Cortex®-M4 errata 838869 and software workaround in the user guide.

8.16 Module SW-Version 1.19

T2MC-183960 - [SPI] Improved Chip Select checking with Configuration file

Title: [SPI] Improved Chip Select checking with Configuration file

Description: When setting the Chip Select function (SpiCsSelection and SpiCsIdentifier parameters) in the SPI driver configuration, if an SCB channel that does not have a Chip Select pin is specified, the Chip Select function cannot be set, and an error occurs in the tresos configuration. Consequently, the corresponding SCB channel cannot be used.

This limitation comes from specification of this driver. However, it is not convenient and it needs to be improved.

T2MC-183983 - Update copyright notice and disclaimer statement

Title: Update copyright notice and disclaimer statement

Description: Copyright notice and disclaimer statement in the file header comment are updated to follow the up-to-date specifications.

Trademarks
All referenced product or service names and trademarks are the property of their respective owners.

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