TRAVEO™ T2G family AUTOSAR MCAL OCU release notes

SRN223360 version 1.10

About this document

Scope and purpose

Thank you for your interest in the TRAVEO™ T2G family AUTOSAR MCAL OCU driver version 1.10. This document lists the installation requirements, software changes, limitations, and known issues.

Intended audience

This document is intended for anyone who uses the output compare unit (OCU) driver of the TRAVEO™ T2G family.

Table of contents

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 (Ocu_lib) section	Size (in bytes)
.text	2014
.bss	2
Combined	2016

GHS (Ocu_src) section	Size (in bytes)
.text	1950
.bss	52
.rodata	420

GHS (Ocu_src) section	Size (in bytes)
Combined	2422

IAR (Ocu_lib) section	Size (in bytes)
.text	1934
.bss	2
Combined	1936

IAR (Ocu_src) section	Size (in bytes)
.text	1640
.bss	52
.rodata	384
Combined	2076

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)
`Ocu_Init`	32
`Ocu_DeInit`	36
`Ocu_StartChannel`	20
`Ocu_StopChannel`	20
`Ocu_SetPinState`	32
`Ocu_SetPinAction`	28
`Ocu_GetCounter`	16
`Ocu_SetAbsoluteThreshold`	44
`Ocu_SetRelativeThreshold`	40
`Ocu_DisableNotification`	20

Function	Max stack usage (in bytes)
Ocu_EnableNotification	20
Ocu_SetPrescaler	28
Ocu_GetVersionInfo	0
Ocu_CheckChannelStatus	56
Ocu_Isr_Vector_276_Cat1	32
Ocu_Isr_Vector_276_Cat2	32
Ocu_Isr_Vector_278_Cat1	32
Ocu_Isr_Vector_278_Cat2	32
Ocu_Isr_Vector_279_Cat1	32
Ocu_Isr_Vector_279_Cat2	32
Ocu_Isr_Vector_282_Cat1	32
Ocu_Isr_Vector_282_Cat2	32

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)
Ocu_Init	32
Ocu_DeInit	48
Ocu_StartChannel	16
Ocu_StopChannel	16
Ocu_SetPinState	16
Ocu_SetPinAction	16
Ocu_GetCounter	16
Ocu_SetAbsoluteThreshold	48
Ocu_SetRelativeThreshold	48
Ocu_DisableNotification	16
Ocu_EnableNotification	16
Ocu_SetPrescaler	32
Ocu_GetVersionInfo	0

Function	Max stack usage (in bytes)
Ocu_CheckChannelStatus	56
Ocu_Isr_Vector_276_Cat1	24
Ocu_Isr_Vector_276_Cat2	24
Ocu_Isr_Vector_278_Cat1	24
Ocu_Isr_Vector_278_Cat2	24
Ocu_Isr_Vector_279_Cat1	24
Ocu_Isr_Vector_279_Cat2	24
Ocu_Isr_Vector_282_Cat1	24
Ocu_Isr_Vector_282_Cat2	24

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
1.10.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 Ocu_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-13933 - [SWS_Ocu_00005] Header file structure: Ocu_Lcfg.c include Ocu.h and Ocu_MemMap.h

Title: [SWS_Ocu_00005] Header file structure: Ocu_Lcfg.c include Ocu.h and Ocu_MemMap.h

Description: [SWS_Ocu_00005] [Ocu_Lcfg.c shall include Ocu.h and Ocu_MemMap.h.] ()

Reason for rejection: Only post-build is supported. Therefore, Ocu_Lcfg.c file is not required.

T2MC-13937 - [SWS_Ocu_00009] Header file structure: Dem.h

Title: [SWS_Ocu_00009] Header file structure: Dem.h

Description: [SWS_Ocu_00009] [The OCU Driver module shall optionally include the Dem.h file if any production error will be issued by the implementation.] (SRS_BSW_00339)

Reason for rejection: OCU module issues no production errors since OCU HW does not detect any errors.

T2MC-13942 - [SWS_Ocu_00012] Version check

Title: [SWS_Ocu_00012] Version check

Description: [SWS_Ocu_00012] [The OCU driver shall perform Inter Module Checks to avoid integration of incompatible files. The imported included files shall be checked by preprocessing directives.
The following version numbers shall be verified:

- <MODULENAME>_AR_RELEASE_MAJOR_VERSION
- <MODULENAME>_AR_RELEASE_MINOR_VERSION

Where <MODULENAME> is the module short name of the other (external) modules, which provide header files included by the OCU driver.
If the values are not identical to the expected values, an error shall be reported.] (SRS_BSW_00004)

Reason for rejection: Inter module version checks shall not be implemented.

T2MC-13949 - [SWS_Ocu_00014] Error classification: Values for production code event Ids

Title: [SWS_Ocu_00014] Error classification: Values for production code event Ids

Description: [SWS_Ocu_00014] [Values for production code Event Ids are assigned externally by the configuration of the DEM. They are published in the file Dem_IntErrId.h and included via Dem.h.] (SRS_BSW_00337)

Reason for rejection: OCU module issues no production errors since OCU HW does not detect any errors.

T2MC-13959 - [SWS_Ocu_00020] Error detection: Detection of production errors

Title: [SWS_Ocu_00020] Error detection: Detection of production errors

Description: [**SWS_Ocu_00020]** [The detection of production errors cannot be switched off.] (SRS_BSW_00339)

Reason for rejection: OCU module issues no production errors since OCU HW does not detect any errors.

T2MC-13962 - [SWS_Ocu_00022] Error notification: Report to DEM

Title: [SWS_Ocu_00022] Error notification: Report to DEM

Description: [SWS_Ocu_00022] [Production errors shall be reported to Diagnostic Event Manager via the API *Dem_ReportErrorStatus*.] (SRS_BSW_00339, SRS_BSW_00422, SRS_BSW_00386)

Reason for rejection: OCU module issues no production errors since OCU HW does not detect any errors.

T2MC-13964 - [SWS_Ocu_00023] Debug support: Variables

Title: [SWS_Ocu_00023] Debug support: Variables

Description: [SWS_Ocu_00023] [Each variable that shall be accessible by AUTOSAR Debugging, shall be defined as global variable.] ()

Reason for rejection: Requirements on debugging in AUTOSAR are set to status "obsolete" from this R4.2.2 and removed in R4.3.0.

T2MC-13965 - [SWS_Ocu_00024] Debug support: Type definitions of variables

Title: [SWS_Ocu_00024] Debug support: Type definitions of variables

Description: [SWS_Ocu_00024] [All type definitions of variables which shall be debugged shall be accessible by the header file Ocu.h.] ()

Reason for rejection: Requirements on debugging in AUTOSAR are set to status "obsolete" from this R4.2.2 and removed in R4.3.0.

T2MC-13966 - [SWS_Ocu_00025] Debug support: sizeof

Title: [SWS_Ocu_00025] Debug support: sizeof

Description: [SWS_Ocu_00025] [The declaration of variables in the header file shall be such that it is possible to calculate the size of the variables by C-"sizeof".] ()

Reason for rejection: Requirements on debugging in AUTOSAR are set to status "obsolete" from this R4.2.2 and removed in R4.3.0.

T2MC-13967 - [SWS_Ocu_00026] Debug support: Describe variables

Title: [SWS_Ocu_00026] Debug support: Describe variables

Description: [SWS_Ocu_00026] [Variables available for debugging shall be described in the respective OCU driver Description.] ()

Reason for rejection: Requirements on debugging in AUTOSAR are set to status "obsolete" from this R4.2.2 and removed in R4.3.0.

T2MC-14089 - [SWS_Ocu_00125] Function definitions: Ocu_GetVersionInfo behavior: Macro definition

Title: [SWS_Ocu_00125] Function definitions: `Ocu_GetVersionInfo` behavior: Macro definition

Description: [SWS_Ocu_00125] [If source code for caller and callee of `Ocu_GetVersionInfo` is available; the OCU driver should realize `Ocu_GetVersionInfo` as a macro, defined in the module's header file.] ()

Reason for rejection: Callee is out of scope against source code regarding `Ocu_GetVersionInfo`. Therefore it should be implemented as a function but not macro.

T2MC-14118 - [SWS_Ocu_00134] Configuration specification: Variants: VARIANT-PRE-COMPILE

Title: [SWS_Ocu_00134] Configuration specification: Variants: VARIANT-PRE-COMPILE

Description: [SWS_Ocu_00134] [VARIANT-PRE-COMPILE (Pre Compile) is limited to pre-compile configuration parameters only.] ()

Reason for rejection: Only post-build is supported.

T2MC-14161 - [SWS_Ocu_00156] Not applicable requirements

Title: [SWS_Ocu_00156] Not applicable requirements

Description: [SWS_Ocu_00156] [These requirements are not applicable to this specification.] (SRS_BSW_00159, SRS_BSW_00167, SRS_BSW_00170, SRS_BSW_00383, SRS_BSW_00375, SRS_BSW_00416, SRS_BSW_00168, SRS_BSW_00423, SRS_BSW_00424, SRS_BSW_00425, SRS_BSW_00426, SRS_BSW_00427, SRS_BSW_00428, SRS_BSW_00429, SRS_BSW_0431, SRS_BSW_00432, SRS_BSW_00433, SRS_BSW_00434, SRS_BSW_00417, SRS_BSW_00161, SRS_BSW_00162, SRS_BSW_00005, SRS_BSW_00415, SRS_BSW_00164, SRS_BSW_00325, SRS_BSW_00326, SRS_BSW_00342, SRS_BSW_00160, SRS_BSW_00007, SRS_BSW_00300, SRS_BSW_00413, SRS_BSW_00347, SRS_BSW_00305, SRS_BSW_00307, SRS_BSW_00310, SRS_BSW_00373, SRS_BSW_00327, SRS_BSW_00335, SRS_BSW_00350, SRS_BSW_00408, SRS_BSW_00410, SRS_BSW_00348, SRS_BSW_00353, SRS_BSW_00361, SRS_BSW_00301, SRS_BSW_00302, SRS_BSW_00328, SRS_BSW_00312, SRS_BSW_00006, SRS_BSW_00357, SRS_BSW_00377, SRS_BSW_00304, SRS_BSW_00355, SRS_BSW_00378, SRS_BSW_00306, SRS_BSW_00308, SRS_BSW_00309, SRS_BSW_00371, SRS_BSW_00358, SRS_BSW_00414, SRS_BSW_00376, SRS_BSW_00359, SRS_BSW_00360, SRS_BSW_00329, SRS_BSW_00330, SRS_BSW_00331, SRS_BSW_00009, SRS_BSW_00401, SRS_BSW_00172, SRS_BSW_00010, SRS_BSW_00333, SRS_BSW_00003, SRS_BSW_00341, SRS_BSW_00334, SRS_SPAL_12267, SRS_SPAL_12461, SRS_SPAL_12462, SRS_SPAL_12463, SRS_SPAL_12068, SRS_SPAL_12069, SRS_SPAL_12169, SRS_SPAL_12075, SRS_SPAL_12064, SRS_SPAL_12067, SRS_SPAL_12077, SRS_SPAL_12078, SRS_SPAL_12092, SRS_SPAL_12265)

Reason for rejection: Named RQMs are not applicable.

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4 Limitations

T2MC-14140 - [ECUC_Ocu_00151] Configuration specification: OcuChannel OcuAssignedHardwareChannel

Title: [ECUC_Ocu_00151] Configuration specification: OcuChannel `OcuAssignedHardwareChannel`

Description:

SWS Item	ECUC_Ocu_00151:		
Name	`OcuAssignedHardwareChannel`		
Description	The physical hardware channel that is assigned to this logical channel.		
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	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: This parameter is not used by the OCU driver and therefore not evaluated. Instead, OCU physical channel can be selected by parameter OcuTimer.

T2MC-14142 - [ECUC_Ocu_00153] Configuration specification: OcuChannel OcuChannelTickDuration

Title: [ECUC_Ocu_00153] Configuration specification: OcuChannel OcuChannelTickDuration

Description:

SWS Item	ECUC_Ocu_00153:		
Name	OcuChannelTickDuration		
Description	Specifies the tick duration of the counter of the channel. This parameter is the number of the input clock edges (rising edges or falling edges exclusively) counted each time to increase the counter by one unit. The value range depends from the used HW, not all allowed values may be relevant.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	1	--	
Default Value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: The range of this parameter is limited to 1. Because this feature is not supported by the hardware.

T2MC-14143 - [ECUC_Ocu_00154] Configuration specification: OcuChannel OcuDefaultThreshold

Title: [ECUC_Ocu_00154] Configuration specification: OcuChannel OcuDefaultThreshold

Description:

SWS Item	ECUC_Ocu_00154:		
Name	OcuDefaultThreshold		
Description	Value of comparison threshold used for Initialization.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 4294967294	--	
Default Value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Note: *The value should be less than or equal to OcuMaxCounterValue.*
For 32-bit TCPWM counter, the range is 0 .. 4294967294.
For 16-bit TCPWM counter, the range is 0 .. 65534.

Limitation: The maximum value of OcuDefaultThreshold depends on the counter width of the TCPWM resource. Due to feature implementation limitations, the maximum value is the maximum counter value - 1.

T2MC-14144 - [ECUC_Ocu_00155] Configuration specification: OcuChannel OcuHardwareTriggeredAdc

Title: [ECUC_Ocu_00155] Configuration specification: OcuChannel OcuHardwareTriggeredAdc

Description:

SWS Item	ECUC_Ocu_00155:	
Name	OcuHardwareTriggeredAdc	
Description	This parameter is used to allow the OCU channel to trigger an ADC channel upon compare match, if this is supported by hardware. The value of the parameter represents the ADC physical channel to trigger.	
Multiplicity	0..1	
Type	EcucIntegerParamDef	
Range	0 .. 255	--
Default Value	0	
Post-Build Variant Multiplicity	true	
Post-Build Variant Value	true	

Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: This parameter is not used by the OCU driver and therefore not evaluated. Instead, triggering the ADC channel can be configured with the OcuHwTriggerOutputLine parameter. It is the responsibility of the Port module to control the triggering infrastructure hardware. It is the responsibility of the Adc module to select trigger inputs for HW-triggered conversion (AdcGroupHwTriggSrc). The Ocu module cannot select the ADC physical channel directly without interfering with the Port module and Adc module. Trigger connection shall be configured by OcuHwTriggerOutputLine, PortTriggerConfigSet.

T2MC-14145 - [ECUC_Ocu_00156] Configuration specification: OcuChannel OcuHardwareTriggeredDMA

Title: [ECUC_Ocu_00156] Configuration specification: OcuChannel OcuHardwareTriggeredDMA

Description:

SWS Item	ECUC_Ocu_00156:		
Name	OcuHardwareTriggeredDMA		
Description	This parameter is used to allow the OCU channel to trigger a DMA channel upon compare match, if this is supported by hardware. The value of the parameter represents the DMA physical channel to trigger.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 255	--	
Default Value	0		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: This parameter is not used by the OCU driver and therefore not evaluated. Instead, the triggering DMA channel can be configured with the OcuHwTriggerOutputLine parameter. It is the responsibility of the Port module to control the triggering infrastructure hardware. The Ocu module cannot select the DMA

channel directly without interfering with the Port module. Trigger connection shall be configured by OcuHwTriggerOutputLine, PortTriggerConfigSet.

T2MC-14146 - [ECUC_Ocu_00157] Configuration specification: OcuChannel OcuMaxCounterValue

Title: [ECUC_Ocu_00157] Configuration specification: OcuChannel OcuMaxCounterValue

Description:

SWS Item	ECUC_Ocu_00157:		
Name	OcuMaxCounterValue		
Description	Maximum value in ticks, the counter of the OCU channel is able to count.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	1 .. 4294967294	--	
Default Value	--		
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Note: *For 32-bit TCPWM counter, the range is 1 .. 4294967294.*
For 16-bit TCPWM counter, the range is 1 .. 65534.

Limitation: The maximum value of OcuMaxCounterValue depends on the counter width of the TCPWM resource. Due to feature implementation limitations, the maximum value is the maximum counter value – 1.

T2MC-14151 - [ECUC_Ocu_00161] Configuration specification: OcuConfigSet OcuGroup

Title: [ECUC_Ocu_00161] Configuration specification: OcuConfigSet OcuGroup

Description:

SWS Item	ECUC_Ocu_00161:
Container Name	OcuGroup
Description	This container contains the parameters for configuring an OCU group.
Configuration Parameters	

Limitation: This parameter is not used by the OCU driver and therefore not evaluated. Because this feature is not supported by the hardware, this container shall not be used.

T2MC-14152 - [ECUC_Ocu_00162] Configuration specification: OcuGroup OcuGroupId

Title: [ECUC_Ocu_00162] Configuration specification: OcuGroup OcuGroupId

Description:

SWS Item	ECUC_Ocu_00162 :
Name	OcuGroupId

Description	Numeric ID of the group. This parameter is the symbolic name of the group.		
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: This parameter is not used by the OCU driver and therefore not evaluated. Because this feature is not supported by the hardware, this configuration parameter shall not be used.

T2MC-14153 - [ECUC_Ocu_00163] Configuration specification: OcuGroup OcuGroupDefinition

Title: [ECUC_Ocu_00163] Configuration specification: OcuGroup OcuGroupDefinition

Description:

SWS Item	ECUC_Ocu_00163:		
Name	OcuGroupDefinition		
Description	Assignment of OcuChannels to an OcuGroup.		
Multiplicity	1..*		
Type	Reference to [OcuChannel]		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: This parameter is not used by the OCU driver and therefore not evaluated. Because this feature is not supported by the hardware, this configuration parameter shall not be used.

T2MC-14156 - [ECUC_Ocu_00165] Configuration specification: OcuHWSpecificSettings OcuClockSource

Title: [ECUC_Ocu_00165] Configuration specification: OcuHWSpecificSettings OcuClockSource

Description:

SWS Item	ECUC_Ocu_00165:
Name	OcuClockSource

Description	The OCU driver specific clock input for the unit can statically be configured to select different clock sources if provided by hardware. Enumeration literals are defined vendor specific.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	--		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: This parameter is not used by the OCU driver and therefore not evaluated. OcuClockSource for whole OCU driver cannot be set because the functionality is not supported by the hardware. In the other way, OcuClockSource can be set inside each counter.

T2MC-14157 - [ECUC_Ocu_00166] Configuration specification: OcuHWSpecificSettings OcuPrescale

Title: [ECUC_Ocu_00166] Configuration specification: OcuHWSpecificSettings OcuPrescale

Description:

SWS Item	ECUC_Ocu_00166:		
Name	OcuPrescale		
Description	Optional OCU driver specific clock prescale factor, if supported by hardware. Implementation is defined vendor specific.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	--		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	--	
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

Limitation: This parameter is not used by the OCU driver and therefore not evaluated. OcuPrescale for whole OCU driver cannot be set because the functionality is not supported by the hardware. In the other way, clock prescale can be set inside each counter.

T2MC-15143 - [Ocu] AUTOSAR C Implementation rules

Title: [Ocu] 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-13928 - [SWS_Ocu_00001] Code file structure: include Ocu_Lcfg.c and Ocu_PBcfg.c

Title: [SWS_Ocu_00001] Code file structure: include Ocu_Lcfg.c and Ocu_PBcfg.c

Description: [SWS_Ocu_00001] [The code file structure shall not be defined completely within this specification. At this point it shall be pointed out that the code-file structure shall include the following files:

- Ocu_Lcfg.c - for link time configurable parameters
- Ocu_PBcfg.c - for post build time configurable parameters

These files shall contain all link time and post-build time configurable parameters.] (SRS_BSW_00419, SRS_BSW_00346, SRS_BSW_00158, SRS_BSW_00314, SRS_BSW_00370)

Limitation: Link time configuration is not supported.

T2MC-13958 - [SWS_Ocu_00019] Error detection: API parameter checking

Title: [SWS_Ocu_00019] Error detection: API parameter checking

Description: [SWS_Ocu_00019] [If the switch OcuDevErrorDetect is enabled, then API parameter checking is enabled. The detailed description of the detected errors can be found in chapter Error classification and chapter API specification.] (SRS_BSW_00386, SRS_BSW_00338, SRS_BSW_00369, SRS_BSW_00339)

Limitation: Because DET error detection mechanisms are used as safety mechanisms (fault detection), the detection of development error cannot be disabled.

T2MC-13970 - [SWS_Ocu_00027] Imported types

Title: [SWS_Ocu_00027] Imported types

Description: [**SWS_Ocu_00027]** [

Module	***Imported Type***
Dem	Dem_EventIdType
	Dem_EventStatusType
Std_Types	Std_ReturnType
	Std_VersionInfoType

] ()

Limitation: Dem is not used for OCU since there are no production errors.

T2MC-14096 - [SWS_Ocu_00127] Optional interfaces

Title: [SWS_Ocu_00127] Optional interfaces

Description: [SWS_Ocu_00127] [

API Function	*Description*
Dem_ReportErrorStatus	Queues the reported events from the BSW modules (API is only used by BSW modules). The interface has an asynchronous behavior, because the processing of the event is done within the DEM main function. OBD Events Suppression shall be ignored for this computation.
Det_ReportError	Service to report development errors.

] ()

Limitation: Dem is not used for OCU since there are no production errors.

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 1.2

Initial module setup.

8.2 Module SW-Version 1.3

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-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 1.4

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-43302 - [GPT, ICU, OCU, PWM] Improve trigger configuration check

Title: [GPT, ICU, OCU, PWM] Improve trigger configuration check

Description: If the input trigger resource for TCPWM is shared by other modules, a warning message is output. To improve usability and prevent misuse, make conflict processing clear when it is shared in related config parameters.

The related configurations are as follows. For more details, please see the attached file.

GPT

- GptPredefTimerStartTriggerSelect
- GptInputTriggerSelection

ICU

- IcuInputTriggerSelection
- IcuChannelGroupStartTrigger
- IcuChannelGroupStopTrigger

OCU

- OcuStartTriggerSelect0
- OcuStartTriggerSelect1

PWM

- PwmChannelGroupStartTrigger
- PwmChannelGroupStopTrigger
- PwmStartTriggerSelect0
- PwmStartTriggerSelect1
- PwmStartDelayTrigger

T2MC-39475 - [ICU, OCU, PWM] Wrong behavior occurred due to API input while waiting for synchronous start/stop trigger

Title: [ICU, OCU, PWM] Wrong behavior occurred due to API input while waiting for synchronous start/stop trigger

Description: Malfunction occurred due to other API input while waiting for synchronous start trigger.

T2MC-39460 - [OCU] Support TRAVEO™ T2G-B-H-8M

Title: [OCU] Support TRAVEO™ T2G-B-H-8M

Description: AUTOSAR MCAL supports the TRAVEO™ T2G-B-H-8M.

TCPWM resource data has instances of TCPWM. Therefore, Ocu driver must identify TCPWM resource instances in the following cases.

- TCPWM resources for all instances need to be obtained from the resource properties file and made selectable in the module configuration.
- Instance support is required for processing associated with TCPWM resources (for example, configuration, generated code, etc.).

In addition to the above, users guide needs update.

T2MC-38072 - [PWM, OCU] Outputs a momentary level change under certain condition

Title: [PWM, OCU] Outputs a momentary level change under certain condition

Description: PWM/OCU driver may output a momentary level change under certain conditions.

Momentary output level change may occur when the following APIs are called under certain conditions.
PWM API:
Pwm_Init, Pwm_SetDutyCycle, Pwm_SetPeriodAndDuty, Pwm_StartGroupTrigger, Pwm_SetOutputToIdle, Pwm_StopGroupTrigger, Pwm_EnableTrigger, Pwm_DisableTrigger, Pwm_SetPrescaler, Pwm_DeInit

OCU API:
Ocu_Init, Ocu_SetPinState, Ocu_SetPinAction, Ocu_StartChannel, Ocu_StopChannel, Ocu_SetPrescaler

---

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.

8.4 Module SW-Version 1.5

T2MC-59531 - [GPT] Correction of prescale and input trigger selection of the external input clock.

Title: [GPT] Correction of prescale and input trigger selection of the external input clock.

Description: In case of the external clock input (CLI_EXT), the following configuration parameter should be corrected:

#1. GptChannelPrescale
Prescale value should be fixed to 1 because the prescaler cannot be used in the case of the external clock.

#2. GptInputTriggerSelection
Allow to select trigger multiplexer as the clock sources of the external input clock for external clock input functional enhancement.

Note: *Modification #2 affects resource conflict check processing in ICU, OCU, and PWM modules (xdm files, user guides).*

T2MC-59485 - [OCU] Improve hardware trigger output.

Title: [OCU] Improve hardware trigger output.

Description: Trigger output shall be improved for flexibility: All trigger destinations shall be supported, not just ADC and DMA.

Therefore, the following changes shall be made:

1. The configuration parameter OcuHardwareTriggeredAdc/OcuHardwareTriggeredDma shall be renamed to OcuHwTriggerOutputLine.
2. OcuHwTriggerOutputLine shall allow all trigger outputs that are connectable to any HW (not just ADC and DMA) on the particular chip.

T2MC-59626 - [OCU] ECUC-MULTIPLICITY-CONFIGURATION-CLASS definition is missing.

Title: [OCU] ECUC-MULTIPLICITY-CONFIGURATION-CLASS definition is missing.

Description: The following messages should be resolved if they are detected by new AMDC tool version 1.0.17.

- A container has no 'ECUC-MULTIPLICITY-CONFIGURATION-CLASS' elements. (warning based on rule A205)
- A parameter has no 'ECUC-MULTIPLICITY-CONFIGURATION-CLASS' elements. (warning based on rule A205)

The following is supported in release V1.2.4.

T2MC-77594 - Support IAR compiler

Title: Support IAR compiler

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

8.5 Module SW-Version 1.6

T2MC-91143 - [OCU] Duplicate Bundle-Vendor name in manifest file

Title: [OCU] Duplicate Bundle-Vendor name in manifest file

Description: During the generation of the build environment config, the following warning was observed:

*WARNING: Duplicate name in manifest: Bundle-Vendor.

Ensure that the manifest does not have duplicate entries, and

that blank lines separate individual sections in both your

manifest and in the META-INF/MANIFEST.MF entry in the jar file*

On analysis, it was found that the warning is caused by the duplicate tag "Bundle-Vendor: Cypress" in the

plugins\Ocu_TS_T40D13M1I0R0\META-INF\MANIFEST.MF file.

No noticeable failures were detected due to this warning.

T2MC-91795 - [OCU] Ocu.xdm is inconsistent with Ocu.arxml

Title: [OCU] Ocu.xdm is inconsistent with Ocu.arxml

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

Ocu.xdm

- VariantLinkTime and VariantPreCompile in POSTBUILDVARIANTSUPPORT are not required.
- POSTBUILDVARIANTMULTIPLICITY is incorrect in OcuChannel.
- IMPLEMENTATIONCONFIGCLASS is incorrect in OcuIncludeFile.

Ocu.arxml

- The description of OcuHwTriggerOutputLine is different in *Ocu.xdm* and *Ocu.arxml*.
- POST-BUILD-VARIANT-MULTIPLICITY is incorrect in OcuChannel.
- LOWER-MULTIPLICITY and UPPER-MULTIPLICITY are incorrect in some parameters.

The following are supported in release V1.5.0.

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-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.

8.6 Module SW-Version 1.7

T2MC-164408 - Improvement of interrupt register clear processing

Title: Improvement of interrupt register clear processing

Description: Some modules clear the interrupt register by read modify write (RMW). However, there is a possibility that unintended bits might also be cleared, if some bits are already set before clearing, because the attribute of the interrupt register is RW1C (every bit is cleared upon writing 1).

Also, unnecessary read access to the register reduces performance.

Therefore, change the clearing process to write intended bit only.

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.

8.7 Module SW-Version 1.8

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.

8.8 Module SW-Version 1.9

T2MC-170534 - [OCU] Interrupt status flag cleared at the end of interrupt processing

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

Description: The OCU interrupt function clears the interrupt flag after performing interrupt processing. So, if an interrupt of the same factor occurs during interrupt processing, it is not processed. The interrupt function should clear the flag at the beginning to allow handling of factors that occur during OCU interrupts.

If an interrupt occurs during interrupt processing whatever the factor it is, it will be missed and will not be called user-specified notification function.

Workaround:
Make the system premised on interrupts being lost if the OcuMaxCounterValue is too short, or disable the notification.

T2MC-170798 - [OCU] Need to guarantee the order of register settings between relevant peripherals for robustness

Title: [OCU] 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, the order of register settings must be guaranteed. It is also necessary to guarantee the order of CPU instructions and peripheral operations.
The OCU driver before Port_ActTrigger is called must guarantee the order of register settings that might be the disrupted by the write cache.
Therefore, the register read back process was added to the OCU driver in order to avoid this issue.

T2MC-170547 - [OCU] Unused structure member

Title: [OCU] Unused structure member

Description: An unused structure member has been found inside MCAL code. A structure member TickDuration exists in Ocu_ChannelConfigType and it is not used at all. This issue would not affect any functions and its behavior. However, the unused structure member should be removed because it is redundant.

T2MC-170664 - Limitation on notification is missing in user guide

Title: Limitation on notification is missing in user guide

Description: There is a possibility that notifications are performed (under a particular condition) even if the notification is disabled. This unexpected behavior would hardly ever occur; however, it should be described in the user guide with a solution to avoid it.

[Conditions]

- Notification is enabled in advance before the notification is called.
- Notification is changed to be disabled in a few cycles just before the notification is called.

[Workaround]

Notification is disabled in advance before running the service.

The following are supported in release V1.12.0.

T2MC-178684 - Addition of necessary steps before entering DeepSleep mode in the user guide

Title: Addition of necessary steps before entering DeepSleep mode in the user guide

Description: Add the information in the user guide on the API that needs to be called to stop the TCPWM counter before entering DeepSleep mode.

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.

8.9 Module SW-Vesion 1.10

T2MC-183951 - [OCU] Compare match does not occur if the threshold value is the same as OcuMaxCounterValue

Title: [OCU] Compare match does not occur if the threshold value is the same as OcuMaxCounterValue

Description: The compare match event does not occur in the following cases.

- Ocu_SetAbsoluteThreshold(): If AbsoluteValue parameter equals OcuMaxCounterValue, the event does not occur.
- Ocu_SetRelativeThreshold(): If the sum of the current counter value and RelativeValue parameter equals OcuMaxCounterValue, the event does not occur.
- OcuDefaultThreshold: If OcuDefaultThreshold is equal or greater than OcuMaxCounterValue, the event does not occur and also the configuration error does not occur.

T2MC-183954 - [OCU] The range of the OCU counter value is 1 tick shorter than the AUTOSAR specification

Title: [OCU] The range of the OCU counter value is 1 tick shorter than the AUTOSAR specification

Description: The OCU counter value range must be 0 to "OcuMaxCounterValue" based on the AUTOSAR specification and the interval becomes "OcuMaxCounterValue + 1". However, the OCU driver counter value

range is 0 to "OcuMaxCounterValue –1" and the interval becomes "OcuMaxCounterValue". This will cause the next interval compare match to occur 1 tick earlier.

Note: *To fix this defect, the maximum value of OcuMaxCounterValue should be limited as follows because the maximum value of the counter is used for another OCU feature:*
The maximum value of OcuMaxCounterValue is changed from “maximum counter value” to “maximum counter value –1”. (e.g., the max value of a 32-bit counter is 0xFFFFFFFE.)

T2MC-183955 - [OCU] Update Ocu_SetPinState() description in the user guide

Title: [OCU] Update Ocu_SetPinState() description in the user guide

Description: The OCU driver counter repeats 0 to OcuMaxCounterValue as a free-running timer.
Ocu_SetPinState() is described as follows in the OCU user guide:
Service to set the level of the pin associated with an OCU channel. This API stops the counter once.

However, there is a shortage in "reset and restart" behavior description, so update the description as follows:
Service to set the level of the pin associated to an OCU channel. The Ocu_SetPinState () API stops the counter once to change pin state, and then the counter is reset and restarted.

T2MC-183953 - [OCU] When OcuCountdirection is configured with OCU_DOWNCOUNTING, the threshold is not processed correctly

Title: [OCU] When OcuCountdirection is configured with OCU_DOWNCOUNTING, the threshold is not processed correctly

Description: When OcuCountdirection is configured with OCU_DOWNCOUNTING, the following issues occur.

- The Ocu_SetAbsoluteThreshold() API and Ocu_SetRelativeThreshold() API return incorrect value.
  If the return value is OCU_CM_OUT_REF_INTERVAL, the correct value is OCU_CM_IN_REF_INTERVAL.
  If the return value is OCU_CM_IN_REF_INTERVAL, the correct value is OCU_CM_OUT_REF_INTERVAL.
- The new threshold set by Ocu_SetRelativeThreshold () is not subtracted from the current counter value, but was added incorrectly.

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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