MC-ISAR_AS42x_TC3xx_BASIC_1.30.0

Release Notes
Product name: MC_AURIX2G_SW_MCAL
Release number: 1.30.0
Type of release: PR*
Release method: via Release Area
AUTOSAR specification: 4.2.2
Compiler support: Tasking 6.2r2p2, HighTec GNU 4.9.2.0
Processor platform: TC39xBA, TC39xBB, TC39xBC, TC38xAA, TC38xAB, TC38xAC, TC38xAD, TC37xEDAA, TC37xEDAB, TC37xAA and TC35xAA
Date: 2019-10-24
Previous release number: 1.30.0-rc

About this document

Scope and purpose

This release notes, for the 1.30.0 delivery of TC3xx_SW_MCAL basic drivers, details the release contents, all known issues in this release and the changes from the last release. This document also provides information on tools, compiler options and support packages.

New issues identified since the last release of this document are detailed first, followed by all issues identified in previous versions of this release.

The following modules are supported in this release:

- Adc (10.30.0)
- Bfx (10.30.0)
- Can_17_McmCan (10.30.0)
- CanTrcv_17_V9251 (10.30.0)
- CanTrcv_17_W9255 (10.30.0)
- Crc (10.30.0)
- Dio (10.30.0)
- Fee (10.30.0)
- Fls_17_Dmu (10.30.1)
- Gpt (10.30.1)
- Icu_17_TimerIp (10.30.1)
- Lin_17_AscLin (10.30.0)
- McalLib (10.30.0)
- Mcu (10.30.1)
- Ocu (10.30.1)
- Port (10.30.1)
- Pwm_17_GtmCcu6 (10.30.1)
- Spi (10.30.0)
- Wdg_17_Scu (10.30.1)

Further generic references to Modules are indicated as <Mod>, where <Mod> represents the above module short names.

Note: ** This release is intended for production use.*

About this document

Attention**: **Refer to the Limitations and deviations section before using the software for integration.

Intended audience

This document is intended for anyone using the TC3xx_SW_MCAL software.

Reference documents

None.

Table of contents

1 Release contents

1.1 Release overview

This release is of PR quality. Section 1.4 provides module-wise quality information.

TC36x and TC33x plug-in support is available in the current 1.30.0 release. However, customer should not use this release with TC36x and TC33x as validity of this release is limited to TC39xBA, TC39xBB, TC39xBC, TC38xAA, TC38xAB, TC38xAC, TC38xAD, TC37xEDAA, TC37xEDAB, TC37xAA and TC35xAA.

1.2 Released items

The release is contained in the `MC-ISAR_AS42x_TC3xx_BASIC_1.30.0.zip` file. The contents of this file include the MCAL software, EB tresos plugin files (BMD included), User Manuals and Release Notes.

Note: The package also includes Build Environment, Fee Calculator tool and Demo Application, which are not attached with any quality but provided for demonstration purpose only.

Table 1 Release zip contents

Package content	Description
`MC-ISAR_AS42x_TC3xx_BASIC_1.30.0.exe`	Product installer to be used with AUTOSAR Version 4.2.2
User Manuals	Contains the MCAL User Manual and MCAL Configuration Verification User Manual
`Releasenote_MC-ISAR_AS42x_TC3xx_BASIC_1.30.0.pdf`	Contains the Release Notes
`TC3xx_SW_MCAL_HWErrataAnalysis.xlsx`	Contains analysis for the hardware errata sheet
`TC3xx_SW_MCAL_FEE_Cycle_Calculator.xlsx`	Calculates required amount of threshold and flash cycles based on user provided block information, such as block size and no of writes over the lifecycle.

1.2.1 Driver files

Table 2 Driver file description

File name	Description
`<Mod>_<Ie>.c`	Contains the <Mod>_<Ie> source files located in `\McIsar\Src\Mcal\Tricore\<Mod>\ssc\src`.
`<Mod>_<Ie>.h`	Contains the <Mod>_<Ie> header files located in `\McIsar\Src\Mcal\Tricore\<Mod>\ssc\inc`.

Note: In the above table, `Ie` stands for implementation specific.

1.2.2 Common files

Table 3 Common files

File / folder name	Description
`McalLib.c`	Contains MCAL function source file located in `\McIsar\Src\Mcal\Tricore\McalLib\ssc\src`
`McalLib.h`	Contains MCAL library function header file located in `\McIsar\Src\Mcal\Tricore\McalLib\ssc\inc`
`\McIsar\Src\Infra_Prod\Platform`	Contains the compiler abstraction and standard type definitions

`\McIsar\Src\Infra_Prod\Sfr\TC37xA\_Reg`
`\McIsar\Src\Infra_Prod\Sfr\TC37xA_ED\_Reg`
`\McIsar\Src\Infra_Prod\Sfr\TC38xA\_Reg`
`\McIsar\Src\Infra_Prod\Sfr\TC39xB\_Reg`
`\McIsar\Src\Infra_Prod\Sfr\TC35xA\_Reg`
	Contains the Special Function Register (SFR) definitions for device(s)

`Mcal_Compiler.h`	Contains MCAL-specific compiler abstractions file located in `\McIsar\Src\Mcal\Tricore\McalLib\ssc\inc`

1.2.3 EB tresos plugin files

Note: Resource_Aurix2G contains the properties for the TC39xBA, TC39xBB, TC39xBC, TC38xAA, TC38xAB, TC38xAC, TC38xAD, TC37xEDAA, TC37xEDAB, TC37xAA and TC35xAA.

Table 4 Plugin files

Folder name	Description
Autosar	Contains the BMD files for the module located in `\McIsar\PluginsTresos\eclipse\Plugins\<Mod>_Aurix2G`
Config	Contains the XDM tresos plugin files for the module located in `\McIsar\PluginsTresos\eclipse\Plugins\<Mod>_Aurix2G`
Generate	Contains the template for the generated files for the module located in `\McIsar\PluginsTresos\eclipse\Plugins\<Mod>_Aurix2G`
plugin.properties	Contains the plugin property for the module located in `\McIsar\PluginsTresos\eclipse\Plugins\<Mod>_Aurix2G`
plugin.xml	Contains the plug-in information, located in `\McIsar\PluginsTresos\eclipse\Plugins\<Mod>_Aurix2G`
anchors.xml	

1.3 Safety

For information on safety, refer to the Safety Case Report document.

1.4 Module-wise quality

Table 5 Module-wise quality

Module	Release quality
Adc	PR
Bfx	PR
Can_17_McmCan	PR
CanTrcv_17_V9251	PR
CanTrcv_17_W9255	PR
Crc	PR
Dio	PR
Fee	PR
Fls_17_Dmu	PR
Gpt	PR
Icu_17_TimerIp	PR
Lin_17_AscLin	PR
Mcu	PR
Ocu	PR *Note: This driver is not supported in TC35x device.*
Port	PR
Pwm_17_GtmCcu6	PR
Spi	PR
McalLib	PR
Wdg_17_Scu	PR

1.5 Compatibility

This release is tested with the following SFR packages:

- TC37xPD: REG_TC37xPD_UM_V1.2.0.R0
- TC37xED: REG_TC37xED_UM_V1.2.0.R0
- TC35xA: REG_TC35XA_UM_V1.2.0.R0
- TC38xA: REG_TC38XA_UM_V1.1.0.R0
- TC39xB: REG_TC39XB_UM_V1.1.0.R0

Release contents

Note: TC38x and TC39x SFR files were generated using UM 1.1. Changes between HW UM 1.1 and 1.2 were analyzed. No impact to SFR files due to the changes. Hence HW UM 1.2 is valid for TC38x and TC39x SFR files.

2 Tool information

Table 6 Tool information

Tool description	Version details
Compiler	TASKING TriCore 6.2r2p2 HighTec TriCore 4.9.2.0
Processor platform	TC39xBA, TC39xBB, TC39xBC, TC38xAA, TC38xAB, TC38xAC, TC38xAD, TC37xEDAA, TC37xEDAB, TC37xAA and TC35xAA
Evaluation hardware	TriBoard TC3x9 TriBoard TC3x7
Code configuration and generation tool	EB tresos Studio 23.0.0 Build Nr. b170330-0431

*Note: For more information on WibuKey issue related to the EB Tresos installation, refer to **https://www.wibu.com/us/support/user/downloads-user-software.html**. The WibuKey issue numbers are: CVE-2018-3989, CVE-2018-3990 and CVE-2018-3991. The Tresos license provided by Infineon Technologies does not require WibuKey software.*

Table 7 AURIX™2G umbrella device support

AURIX™ 2G umbrella device	Name displayed in Tresos tool	Tresos property file
SAK-TC399XE-256F300S	TC399	AURIX2G_TC399.properties
SAK-TC397XE-256F300S	TC397	AURIX2G_TC397.properties
SAK-TC397XT-256F300S	TC397_ADAS	AURIX2G_TC397_ADAS.properties
SAL-TC389QP-160F300S	TC389	AURIX2G_TC389.properties
SAL-TC387QP-160F300S	TC387	AURIX2G_TC387.properties
SAK-TC389QP-160F300S	TC389	AURIX2G_TC389.properties
SAK-TC387QP-160F300S	TC387	AURIX2G_TC387.properties
SAL-TC377TP-96F300S	TC377	AURIX2G_TC377.properties
SAL-TC375TP-96F300W	TC375	AURIX2G_TC375.properties
SAL-TC377DP-96F300S	TC377	AURIX2G_TC377.properties
SAL-TC377TX-96F300S	TC377_ED_EX	AURIX2G_TC377_ED_EX.properties
SAL-TC377TE-96F300S	TC377_ED	AURIX2G_TC377_ED.properties
SAL-TC375TE-96F300W	TC375_ED	AURIX2G_TC375_ED.properties
SAK-TC377TP-96F300S	TC377	AURIX2G_TC377.properties
SAK-TC375TP-96F300W	TC375	AURIX2G_TC375.properties
SAK-TC377DP-96F300S	TC377	AURIX2G_TC377.properties
SAK-TC356TA-64F300S	TC356_ADAS	AURIX2G_TC356_ADAS.properties
SAK-TC357TT-64F300S	TC357_ADAS	AURIX2G_TC357_ADAS.properties

Tool information

Table 8 AURIX™ 2G marking option device support[1)]

AURIX™ 2G marking option device	Name displayed in Tresos tool	Tresos property file
SAL-TC399XX-256F300S	TC399	AURIX2G_TC399.properties
SAL-TC399XP-256F300S	TC399	AURIX2G_TC399.properties
SAL-TC397XP-256F300S	TC397	AURIX2G_TC397.properties
SAK-TC399XP-256F300S	TC399	AURIX2G_TC399.properties
SAK-TC399XX-256F300S	TC399	AURIX2G_TC399.properties
SAK-TC397XP-256F300S	TC397	AURIX2G_TC397.properties
SAK-TC397XA-256F300S	TC397	AURIX2G_TC397.properties
SAK-TC397QA-160F300S	TC397	AURIX2G_TC397.properties
SAK-TC397XX-256F300S	TC397	AURIX2G_TC397.properties
SAK-TC397QP-192F300S	TC397	AURIX2G_TC397.properties
SAK-TC397QP-256F300S	TC397	AURIX2G_TC397.properties
SAK-TC397XZ-256F300S	TC397	AURIX2G_TC397.properties
SAK-TC397XM-256F300S	TC397	AURIX2G_TC397.properties
SAL-TC380QP-160F300S	TC389	AURIX2G_TC389.properties
SAK-TC387TP-128F300S	TC387	AURIX2G_TC387.properties
SAL-TC387TP-128F300S	TC387	AURIX2G_TC387.properties
SAK-TC387TP-160F300S	TC387	AURIX2G_TC389.properties
SAL-TC387TP-160F300S	TC387	AURIX2G_TC389.properties
SAK-TC387QN-160F300S	TC387	AURIX2G_TC387.properties
SAK-TC389QN-160F300S	TC389	AURIX2G_TC389.properties
SAL-TC370TP-96F300S	TC377	AURIX2G_TC377.properties
SAK-TC377TX-96F300S	TC377_ED_EX	AURIX2G_TC377_ED_EX.properties
SAK-TC357TA-64F300S	TC357_ADAS	AURIX2G_TC357_ADAS.properties
SAK-TC357TH-64F300S	TC357_ADAS	AURIX2G_TC357_ADAS.properties
SAK-TC356TH-64F300S	TC356_ADAS	AURIX2G_TC356_ADAS.properties

*Note: **1.** For TC38x, TC39x, TC37x, TC37xEXT and TC35x marking option device support, range check has to be imposed by user, and not in the MCAL code.*

2.1 Compiler options

Table 9 TASKING compiler options used

Options	Description
Compiler options	`--core=tc1.6.2 --iso=99 -O2 --eabi-compliant -AGKpvX --switch=auto --integer-enumeration --default-near-size=0 --fp-model=1`

Tool information

Table 9 TASKING compiler options used (continued)

Options	Description
Assembler options	`--core=tc1.6.2 --list-format=1 --optimize=gs`
Linker options	`-OcLtXY --core=mpe:vtc`

Table 10 HighTec compiler options used

Options	Description
Compiler options	`-Wall -std=c99 -O2 -mtc162 -meabi -fno-short-enums -ffunction-sections -fdata-sections -fstrict-volatile-bitfields`
Assembler options	`-Wall -std=c99 -O2 -mtc162 -meabi -fno-short-enums -ffunction-sections -fdata-sections -fstrict-volatile-bitfields`
Linker options	`-Wl,--mcpu=tc162 -Wl,--gc-sections -nostartfiles -Wl,-n`

Note: Compiler options which influence code generation and are not listed, should be left to the default compiler settings. All the above-listed compiler options are mandatory.

***Attention**: If the compiler options are changed by the user, and if the generated binary output is different than the one generated by the usage of the mandatory compiler options, the functionality and reliability of the drivers cannot be ensured.*

3 Summary of changes

Configuration changes

Table 11 Configuration changes from 1.30.0-rc to 1.30.0

Compatibility check	Result
Are there any change in parameters supplied from previous version?	Yes
Added parameters	**Mcu:** McuSysClkFrequency
Deleted parameters	None
Modified parameters	**Fls_17_Dmu, Gpt, Icu_17_TimerIp, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Wdg_17_Scu:** Modules SwPatchVersion parameter default value is modified. **Icu_17_TimerIp:** • **IcuSignalEdgeDetection, IcuSignalMeasurement, IcuTimestampMeasurement, IcuWakeup:** Parameter PostBuildVariantMultiplicity attribute value is changed from ‘false’ to ‘true’ • **IcuSignalEdgeDetection, IcuSignalMeasurement, IcuTimestampMeasurement, IcuWakeup:** Parameter configuration time error checks are removed. **Mcu:** Added new literal 'SYSCLK_SRC_SELECT_SEL2' in the existing parameter McuPllInputSrcSelection. **Port:** PortPinMode and PortLVDS container ENABLE condition is changed to EDITABLE condition.
Can the previously saved configuration be reused?	Yes

3.1 Issues fixed in release 1.30.0

This chapter describes the fixes for issues from previous version(s).

Table 12 Summary of changes from 1.30.0-rc to 1.30.0

Module	Issue number	Description
Generic	0000053912-7937	Read-only variables present in writable section
	0000053912-8021	36x Property corrections for 1.30.0
Can_17_McmCan	0000053912-8440	Can_17_McmCan UM update for Can_17_McmCan_Init and Can_17_McmCan_SetControllerMode
Fee	0000053912-8096	file has some non-ASCII characters
Fls_17_Dmu	0000053912-7756	Unexpected FLS timeout DET (0x9) reported in normal FLS operation

Summary of changes

Table 12 Summary of changes from 1.30.0-rc to 1.30.0 (continued)

Module	Issue number	Description
	0000053912-8037	OPER needs to be checked as per prog/erase sequence in HW ITS.
	0000053912-8065	Some variables initialized in Fls_17_Dmu_Init() not checked in the FLS initcheck API
	0000053912-8067	Delay to be added after FLS command sequence as per ITS v2.8.0.
	0000053912-8182	const qualifier to be added to the parameters of the function as per DS.
	0000053912-8330	compile time error name if FLs_InitCheck not selected is not named correctly
	0000053912-8424	Issues in Configuration Dependencies
	0000053912-8451	Timeout monitoring & reporting not done per erase/write cycle
Icu_17_TimerIp	0000053912-5463	Support wakeup detection when ICU is in NORMAL mode
	0000053912-8327	Invalid configuration check if variation point is enabled.
	0000053912-8361	Post-Build Variant Multiplicity needs to be changed to TRUE for Edge Detect , Signal Measurement and Time Stamp Containers.
Lin_17_AscLin	0000053912-8615	Checking LIN_RX_ERROR value under No-response status from slave.
McalLib	0000053912-8083	McalLib ARXML file issue
	0000053912-8298	Improve the description of MCALLIB driver in the UM
Mcu	0000053912-7168	No “DISABLE” action in "Mcu_17_Gtm_TomChannelDeInit."
	0000053912-7774	Code Sequence issue in Mcu_17_Gtm_AtomChannelShadowTransfer
	0000053912-8072	selecting external input for oscillator source will generate wrong OSCVAL value
	0000053912-8092	SYSCLK pin cannot be selected as clock source
	0000053912-8468	CPU divider not getting generated properly
Ocu	0000053912-7800	Clock Source is not updated during the First Cycle of Atom\Tom Gtm Timer
Port	0000053912-7526	Ports 40 and 41 ADC config
Pwm_17_GtmCcu6	0000053912-7859	Configuration files not generated properly in case no PWM channel mapped to Core-0
	0000053912-8454	Glitch in Pwm_Init if default TOUT is used for other TOM/ATOM channels *Note: Workarounds: In order to avoid a glitch on the port pins for a PWM channel, the user may follow one of the following:* • *To set the port pins used by the PWM channels as input during the initialization phase of the PWM driver. After*

Summary of changes

Table 12 Summary of changes from 1.30.0-rc to 1.30.0 (continued)

Module	Issue number	Description
		completion of the initialization, the port pin's ALT mode can be restored to PWM functionality. • *To set the port pins used for PWM channels as "Output Low" or "Output High" during the initialization phase of the PWM driver. After completion of the initialization, the port pin's ALT mode can be restored to PWM functionality.*
Wdg_17_Scu	0000053912-8097	SchM_Wdg_17_Scu.h file has some non-ASCII characters

3.2 Issues fixed in release 1.30.0-rc

Due to the modifications/enhancements to add new device(s) and features in the configuration structure, all configurations generated with 1.20.0-beta/1.30.0-alpha are not compatible with the 1.30.0-rc product.

Configuration changes

Table 13 Configuration changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc

Compatibility check	Result
Are there any change in parameters supplied from previous version?	Yes
Added parameters	**Adc:** AdcBWDEnable, AdcBWDPrechargeLevel
Deleted parameters	**Ocu:** OcuAssignedHardwareModule, OcuAssignedHwUnit
Modified parameters	**Adc:** • AdcChannel0Alias, AdcChannel1Alias parameter configuration rule check is modified • AdcSafetyEnable default value is modified **Can_17_McmCan:** • CanControllerBaseAddress configuration rule check is updated **CanTrcv_17_W9251 and CanTrcv_17_W9255:** • AR root package is modified **Crc:** • For all parameters, PostBuildVariantValue attribute is added Note: The Crc driver is pre-compile. **Fls_17_Dmu:** • FlsWaitStateRead, FlsWaitStateErrorCorrection configuration rule is added for default value attribute **Gpt:**

Summary of changes

Table 13 Configuration changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc (continued)

Compatibility check	Result
	• PostBuildVariantValue attribute is added for all parameters • GtmTimerOutputModuleConfiguration parameter configuration rule is updated • Gpt12TimerOutputModuleConfiguration parameter configuration rule is updated **Icu_17_TimerIp:** • TimChannelPortPinSelect, GPT12DirPortSelection, IcuIncrementalInterfaceApi parameter configuration rule is updated **Lin_17_AscLin:** • LinSysClockRef parameter reference is modified **McalLib:** • McalLibMcalAvailableCores parameter configuration rule is updated **Mcu:** • McuFMPllModAmp, McuMscFrequency parameter range check is modified • McuMscClockSourceSelection, McuAdasFrequency configuration rule is added • McuExtClock1Div parameter is renamed to McuFoutClockDiv • McuFoutClockDiv, McuClockReferencePointFrequency parameter configuration rule is modified **Ocu:** • OcuAssignedHardwareChannel, OcuChannelTickDuration parameters made editable false • OcuDefaultThreshold, OcuMaxCounterValue, GtmTimerUsed, GtmTimerClockSelect, GtmTimerPortPinSelect parameters configuration rule is modified • OcuHardwareTriggeredAdc configuration rule is added and range check is modified • OcuHardwareTriggeredDMA range check is modified **Port:** • PostBuildVariantValue support is added for the PortPinDirectionChangeable, PortPinInputPullResistor, PortPinOutputPadDriveStrength,

Summary of changes

Table 13 Configuration changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc (continued)

Compatibility check	Result
	PortPinOutputPinDriveMode, PortPinInputPadLevel, PortPinEnableAnalogInputOnly, PortPinEmergencyStop, PortPinControllerSelect, PortLVDSRxEnController, PortLVDSRxPathEnable, PortLVDSRxTerminationMode, PortLVDSMode, PortLVDSPadSupply, PortLVDSTxEnController, PortLVDSTxPathEnable, PortLVDSTxPowerDownPullDown parameters • Configuration rule is updated for the parameters PortPinModeChangeable, PortPinOutputPadDriveStrength, PortPinInputPadLevel • PortPinInputPadLevel range check is updated **Pwm_17_GtmCcu6:** • GtmTimerUsed, GtmTimerPortPinSelect, PwmDutycycleUpdatedEndperiod, PwmPeriodUpdatedEndperiod, PwmChannelCoherentSelection, - PwmHandleShiftByOffset configuration rule is updated **Spi:** • SpiChannelId, SpiJobId, SpiSequenceId parameter is made editable false **Wdg_17_Scu:** • WdgCPUInitialPassowrd parameter is renamed to WdgCPUInitialPassword • GtmTimerConfiguration parameter configuration rule is modified **General:** • For all modules, the default value of the SwMinorVersion parameter is modified
Can the previously saved configuration be reused?	Yes

This chapter describes the fixes for issues from previous version(s).

Table 14 Summary of changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc

Module	Issue number	Description
Generic	0000053912-7100	<Mod>_Bswmd.arxml file enum data type is updated.
	0000053912-5999 0000053912-6784	I2c, Can and Mcallib ARXML files updated to remove the RTE generator errors.

Summary of changes

Table 14 Summary of changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc (continued)

Module	Issue number	Description
	0000053912-6077	The TC356 device configurations allows to configure 8 CAN nodes, but the device has only 7 CAN nodes. User shall configure CAN nodes as per the device datasheet.
	0000053912-7071	MCAL drivers consider ENUM parameters to be an unsigned int instead of signed int.
	0000053912-6550	AMDC error in Mcu, Port, Pwm_17_GtmCcu6 drivers
Adc	0000053912-6172	Increased AdcChannelxAlias to 31 to support diagnostic feature.
	0000053912-6063	Safety error ADC_SE_PARAM_KERNEL is not reported when non-available kernel (within 0-11) is passed as a parameter for the interrupt handlers for the TC357 device. The ADC ISR input parameters range check has to be imposed by the user.
	0000053912-7242	User Manual updated with AdcChannelLowLimit description.
	0000053912-7580	User Manual updated for config pointer passed in the Adc_InitCheck API is not used for checking the correct initialization of driver.
Can_17_McmCan	0000053912-7299	The Can_17_McmCan_lWriteMsgObj function updated to correctly handle the BAR registers. The hardware recommendation for accessing register CCR in function Can_17_McmCan_lDeactivateIcom updated. Sequence of updating the global variable corrected in the Can_17_McmCan_lActivateIcom function to have a proper order of update.
	0000053912-7295	IR bus-off bit is cleared conditionally if CAN_17_MCMCAN_PUBLIC_ICOM_SUPPORT == STD_ON, when both pretended networking for controller are made ON and ICOM on bus-off status is set while expectation is to clear the IR bit if it enters into ISR unconditionally.
	0000053912-7293	For Can_17_McmCan_Write, the return values of local functions are overwritten by internal calls.
	0000053912-7285	Can_17_McmCan_Write is accepted in Can_17_McmCan_SetIcomConfiguration/ Can_17_McmCan_lActivateIcom after setting filter configuration until the global variable is set to CanCoreState->CanIcomEnableStatusPtr[Controller] = TRUE, so if a high priority interrupt triggers a Can_17_McmCan_Write, CAN_BUSY is returned (it was wrongly returning in the previous releases).
	0000053912-7065	RX FIFO notifications are not generated after watermark level crossed till FIFO full.
	0000053912-7064	When a CAN write is triggered on same TX QUEUE channel through high priority interrupt during the processing of one CAN write, one message is lost.
	0000053912-6697	CAN driver stuck after bus-off if message transmitted immediately in the polling mode.

Summary of changes

Table 14 Summary of changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc (continued)

Module	Issue number	Description
	0000053912-7284	Duplication of SWPDU ID on triggering CAN write from same dedicated HTH (interrupt and polling).
	0000053912-6838	CAN Tx confirmation provides wrong values to the CanIf.
	0000053912-7620	CAN RX message indications not received after resuming from RXfull and CAN controller mode put to stop.
	0000053912-7614	CAN warning in GHS.
	0000053912-6029 0000053912-3010	Mixed mode processing to support the interrupt and polling modes.
CanTrcv_17_V9251 and CanTrcv_17_W9255	0000053912-5553	xdm file is corrected to use the module shortname CanTrcv in place of CanTrcv_17_W9255 and CanTrcv_17_V9251.
CanTrcv_17_W9255	0000053912-7021	The CanTrcv_17_W9255_SetPNActivationState() API is returning E_OK for invalid input.
	0000053912-6268	CanTrcvGetVersionInfo will be available for compilation even when CanTrcvGetVersionInfo = OFF.
	0000053912-6266	If the CanTrcv_17_W9255 driver is operated in the polling mode, the driver induces interrupt locking time more than the acceptable limit of 100 microseconds.
	0000053912-6104	A trap is observed instead of reporting a DET when an invalid channel is passed to the CanTrcv_17_W9255_SetWakeupMode API.
	0000053912-6267	The CanTrcvTimerType configuration parameter is editable even though it is mentioned as non-editable in the User Manual.
Dio	0000053912-6170	User Manual updated for wrong value returned for Dio_ReadChannel after Dio_FlipChannel is successfully executed. This impacts only the pins, which are loaded.
	0000053912-7432	For TC37X devices, DET was not observed for Write_Channel and Flip_Channel APIs when tested on Read only Port 40.
Fee	0000053912-6576	User Manual updated for quasi-static integration with NVM.
Fls_17_Dmu	0000053912-7407	User Manual updated for Fls driver status and Job result not set when FLS_17_DMU_E_TIMEOUT DET/SE is raised by Fls_17_Dmu_MainFunction.
	0000053912-7034	FLS status set to initialized in Fls_17_Dmu_Init() even if OPER error is present.
	0000053912-6993	ECC errors not cleared before start of the Write (in erasecheck).
	0000053912-6982	FlsWaitStateRead and FlsWaitStateErrorCorrection calculated values are not proper in tresos.
	0000053912-6912	Runtime Errors need to be reported for timeout in Fls_17_Erase() and Fls_17_Write().

Summary of changes

Table 14 Summary of changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc (continued)

Module	Issue number	Description
	0000053912-6053	When there is an Erase or Write command timeout failure, the runtime error is not being reported. Only the Job error notification is being raised.
	0000053912-5964	In the Fls standalone mode, the Fls_17_Dmu_ResumeErase() API will not report runtime error when there is an operation error, though E_NOT_OK is reported by the API.
	0000053912-5584	Hardware busy check is added in the Fls_17_Dmu_ResumeErase API.
	0000053912-5567	TargetAddress range check for VerifyErase/VerifySectorErase APIs enhanced.
	0000053912-6543	Range parameter for FlsWaitStateRead is corrected in the User Manual.
	0000053912-7573	Unintended FLS_17_DMU_E_TIMEOUT DET/SE raised by Fls_17_Dmu_MainFunction() when call cycle is configured for 100us for write operation.
Gpt	0000053912-7003	Gpt_GetTimeElapsed API returns 0 when Channel in stopped state where as It should have returned time elapsed value.
	0000053912-6845	Critical sections are added for Gpt_StartTimer local functions.
Icu_17_TimeIp	0000053912-6756	Additional configuration check added for TimChannelPortPinSelect.
	0000053912-6486	GPT12 getinpute state for multi-edge detection returning incorrect value.
	0000053912-6189	Icu_17_TimerIP_SetActivationCondition is not setting the detect condition correctly (for ERU) when pre-empted by the Icu_17_TimerIp_EnableEdgeDetection API.
	0000053912-6173	Icu_17_TimerIp_SetActivationCondition not clearing the channel status (for CCU6 and GPT12), if notification is not enabled.
Lin_17_AscLin	0000053912-6547	In Lin.xdm incorrect reference path to McuClockReferencePointConfig is corrected.
Mcallib	0000053912-7192	Release Spinlock not working across cores due to missing synchronization.
	0000053912-5991	In the case when STM is disabled and GetSpinLock is invoked, the following safety errors will be reported: MCALLIB_E_CLKDISABLE and MCALLIB_E_TIMEOUT_FAILED.
	0000053912-6199	User Manual updated for usage of Mcal_WriteSafetyEndInitProtReg and Mcal_WriteSafetyEndInitProtRegMask APIs.
Mcu	0000053912-7098	ERU 4 is not triggering the callback for the Dsadc_Timer_Isr when configured as trigger for the DSADC driver.
	0000053912-7001	McuExtClockDiv is corrected to McuFoutClockDiv in the Mcu_PBcfg.c file.
	0000053912-6847	GTM option is removed in EXTCLK0 for 357_ADAS device.
	0000053912-6846	GTM error check dependencies removed for 357_ADAS device.

Summary of changes

Table 14 Summary of changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc (continued)

Module	Issue number	Description
	0000053912-6805	Error in configuration if McuAtomChannelEventHandledByDsadc is TRUE is corrected.
	0000053912-6737	Wrong ERU EIFR mask generation.
	0000053912-6595	Generation error with DaVinci corrected.
	0000053912-6107	MCU_ETHRAM_FREQUENCY option is removed.
	0000053912-6055	Mcu_InitCheck will wrongly report E_NOT_OK only if the ADC trigger is configured and the TBU channels are enabled.
	0000053912-6041	Wrong configuration generated at bit 26 and bit 24 for the CCUCON2 register.
	0000053912-5582	The range of the McuFMPllModAmp parameter is incorrect leading to jitter in the clock if user selects a value > 2.
	0000053912-7108	fSource2 is mapping is corrected in the User Manual.
	0000053912-6712	Incorrect MCAL generated value for external clock 1 EXTCLK1 .
	0000053912-6711	Configuration support added to enable ADAS clock on non-ADAS device.
	0000053912-6701	MCAN clock source to external oscillator support added.
	0000053912-7423	When configuring FSI to 20 MHz and FSI2 to 40 MHz the codegen logic is not performing error check in relation to SRI frequency, which may lead to implausible value being programmed into the SFR.
Ocu	0000053912-7036	TBU resolution is not taken care when calculating the return value.
	0000053912-6746	Safety error is raised when the passed reference/compare value is equal to the maximum threshold.
	0000053912-6300	The Ocu_Deinit() API leads to a trap if called without the Ocu_Init() API call.
	0000053912-6293	The Ocu_InitCheck() API returns E_NOT_OK when only ADC trigger is configured for the OCU channel.
	0000053912-6263	Wrong compare match can be triggered in the following cases: • Ocu_StartChannel() API is pre-empting the Ocu_SetAbsoluteThreshold() API • Ocu_SetAbsoluteThreshold() API is pre-empting the Ocu_SetRelativeThreshold() API
	0000053912-6250	ADC is additionally triggered even after StopChannel is called.
	0000053912-6175	UPEN bit checking is missed in the Initcheck API after the SFR access.
	0000053912-6151	Data inconsistency when the Ocu_EnableNotification API is pre-empted by the Ocu_StartChannel API.
	0000053912-5620 0000053912-6858	TOUT conflict resolution between PWM and OCU added.
	0000053912-7009	Compare register is wrongly written when clock source is TBU_TS0.

Summary of changes

Table 14 Summary of changes from 1.20.0-beta/1.30.0-alpha to 1.30.0-rc (continued)

Module	Issue number	Description
	0000053912-7185	Compiler warnings to be fixed in the driver code for GHS, GNU and Tasking compilers for the following conditions: • DET = ON, Safety = OFF and Multicore = OFF • DET = OFF, Safety = ON and Multicore = OFF
	0000053912-7418	Enum Ocu_CountDirectionType is removed from the ARXML file.
	0000053912-7567	AoU is added in the User Manual.
Port	0000053912-6873	In the PORT driver, LVDS functionality is enabled by default for Port14.
	0000053912-6757	In the PORT driver, the Alt selection is made available now.
	0000053912-6365	Port22.0 generates a wrong macro required for GETH.
	0000053912-6001	Selection of PortPinPadDriverStrength changed to be port pin specific.
	0000053912-7344	Port_SetPinDirection range check missing for direction input parameter.
	0000053912-6762	Variation point option added for Port parameters.
Pwm_17_GtmCcu6	0000053912-7131	TOM_CH_IRQ_NOTIFY Register is not cleared after Pwm_DeInit.
	0000053912-7089	Missing interrupt enabling in case the PWM channel (using GTM) is used to generate DSADC gate signal is corrected.
	0000053912-6549	Linker error resolved when compiling the Pwm_17_GtmCcu6 driver.
	0000053912-6387	Pwm_InitCheck will fail if T13 for CCU60 or T12 for CCU61 is configured.
	0000053912-6079	For 35x device, since GTM is not available few tresos config items are not supported which are grayed out.
	0000053912-6040	Warning observed in the Pwm_17_GtmCcu6.c file when CCU6 alone is configured and no GTM channels are configured.
Spi	0000053912-7032	SpiChannelId, SpiJobId and SpiSequenceId config parameters are made non-editable.
	0000053912-6783	Reporting SPI_E_SAFETY_SPURIOUS_INTERRUPT also checks for the interrupt enable status.
	0000053912-6299	Inconsistent reporting of Queue Full DETs across device(s).
	0000053912-6203	Safety DET is reported by Spi_ControlLoopBack API when invoked with invalid hardware ID.
	0000053912-7669	If Async_Transmit is called while SPI_SEQ_PENDING, SchM_Exit_Spi_Queue_Update() is called twice may cause the issue in the OS.
Wdg_17_Scu	0000053912-6684	DET major version check is updated not to be dependent on the WdgSafetyEnable parameter.
	0000053912-6167	GTM channels reserved by the WDG does not throw error even if they are not used by the WDG.

3.3 Issues fixed in release 1.30.0-alpha

This is the first Alpha delivery for the product.

3.4 Enhancements and issues fixed from 1.10.0 to 1.30.0-rc

This chapter describes the enhancements and issues fixed from 1.10.0 to 1.30.0-rc.

Table 15 Enhancements and issues fixed from 1.10.0 to 1.30.0-rc

Module	Issue number	Description
Generic	0000053912-5999	I2c, Can and McalLib ARXML files updated to remove the RTE generator errors.
	0000053912-6550	AMDC error in Mcu, Port, Pwm_17_GtmCcu6 drivers.
Adc	0000053912-6172	Increased AdcChannelxAlias to 31 to support diagnostic feature.
Can_17_McmCan	0000053912-7295	IR bus-off bit is cleared conditionally if CAN_17_MCMCAN_PUBLIC_ICOM_SUPPORT == STD_ON, when both pretended networking for controller are made ON and ICOM on bus-off status is set while expectation is to clear the IR bit if it enters into ISR unconditionally.
	0000053912-7293	For Can_17_McmCan_Write, the return values of local functions are overwritten by internal calls.
	0000053912-7285	Can_17_McmCan_Write is accepted in Can_17_McmCan_SetIcomConfiguration/ Can_17_McmCan_lActivateIcom after setting filter configuration until the global variable is set to CanCoreState->CanIcomEnableStatusPtr[Controller] = TRUE, so if a high priority interrupt triggers a Can_17_McmCan_Write, CAN_BUSY is returned (it was wrongly returning in the previous releases).
	0000053912-7065	RX FIFO notifications are not generated after watermark level crossed till FIFO full.
	0000053912-6697	CAN driver stuck after bus-off if message transmitted immediately in the polling mode.
	0000053912-7284	Duplication of SWPDU ID on triggering CAN write from same dedicated HTH (interrupt and polling).
	0000053912-7620	CAN RX message indications not received after resuming from RXfull and CAN controller mode put to stop.
	0000053912-6029 0000053912-3010	Mixed mode processing to support the interrupt and polling modes.
Fee	0000053912-6576	User Manual updated for quasi-static integration with NVM.
Fls_17_Dmu	0000053912-6982	FlsWaitStateRead and FlsWaitStateErrorCorrection calculated values are not proper in tresos.
	0000053912-6053	When there is an Erase or Write command timeout failure, the runtime error is not being reported. Only the Job error notification is being raised.
	0000053912-5584	Hardware busy check is added in the Fls_17_Dmu_ResumeErase API.

Table 15 Enhancements and issues fixed from 1.10.0 to 1.30.0-rc (continued)

Module	Issue number	Description
	0000053912-5567	TargetAddress range check for VerifyErase/VerifySectorErase APIs enhanced.
	0000053912-7573	Unintended FLS_17_DMU_E_TIMEOUT DET/SE raised by Fls_17_Dmu_MainFunction() when call cycle is configured for 100 µs for write operation.
Gpt	0000053912-6845	Critical sections are added for Gpt_StartTimer local functions.
Icu_17_TimeIp	0000053912-6756	Additional configuration check added for TimChannelPortPinSelect.
Mcallib	0000053912-6199	User Manual updated for usage of Mcal_WriteSafetyEndInitProtReg and Mcal_WriteSafetyEndInitProtRegMask APIs.
Mcu	0000053912-6737	Wrong ERU EIFR mask generation.
	0000053912-6041	Wrong configuration generated at bit 26 and bit 24 for the CCUCON2 register.
	0000053912-5582	The range of the McuFMPllModAmp parameter is incorrect leading to jitter in the clock if user selects a value > 2.
	0000053912-6712	Incorrect MCAL generated value for external clock 1 EXTCLK1 .
	0000053912-6711	Configuration support added to enable ADAS clock on non-ADAS device.
	0000053912-7423	When configuring FSI to 20 MHz and FSI2 to 40 MHz the codegen logic is not performing error check in relation to SRI frequency, which may lead to implausible value being programmed into the SFR.
Ocu	0000053912-6858	TOUT conflict resolution between PWM and OCU added.
Port	0000053912-6001	Selection of PortPinPadDriverStrength changed to be port pin specific.
Spi	0000053912-7669	If Async_Transmit is called while SPI_SEQ_PENDING, SchM_Exit_Spi_Queue_Update() is called twice may cause the issue in the OS.

4 Known issues

This chapter describes the prescribed workarounds for all the open issues identified.

Table 16 Known issues

Module	Issue number	Description
Generic	0000053912-6844	Impact: There could be potential issues with the Tasking compiler for the following issues: TCVX-43893, TCVX-43916, TCVX-43928. Workaround: None. The issue is not observed during internal testing of the MCAL.
	0000053912-6691	Impact: Tresos errors when generating variation point configuration using command line. This is a limitation of Tresos Tool Workaround: None

Table 16 Known issues (continued)

Module	Issue number	Description
	0000053912-6925	Impact: Tresos tool is not generating ECUC-DEF-EDITION attribute in the exported arxml configuration file, when non-tresos tool user tries to import the tresos tool generated arxml configuration file in their configuration tool, configuration might not import properly without ECUC-DEF-EDITION attribute. Workaround: After exporting the configuration arxml file from tresos tool, user shall manually add the following syntax <ECUC-DEF-EDITION>testmod</ECUC-DEF-EDITION> in the arxml file after <DEFINITION-REF DEST="ECUC-PARAM-CONF-CONTAINER-DEF"> .... </DEFINITION-REF> syntax.
Port	0000053912-7344	Impact: Range check is not done for input parameter Direction and no error shall be reported if wrong values are passed. If wrong value is passed, the direction will made as Input. Workaround: User shall ensure PORT_PIN_IN (0) or PORT_PIN_OUT (0x80) is passed for the input parameter Direction in Port_SetPinDirection API.
Spi	0000053912-8519	Impact: Setting configuration parameter SpiInitCheckApi as either TRUE or FALSE does not influence the code, instead the availability of Spi_InitCheck() API is controlled by SpiSafetyCheckEnable configuration parameter. Hence if SpiSafetyCheckEnable is set to FALSE and SpiInitCheckApi is set to TRUE then Spi_InitCheck() API will not be available. Workaround: Configure SpiSafetyCheckEnable to TRUE if Spi_InitCheck() API has to be made available.

5 Limitations and deviations

This chapter describes the limitations and deviations due to software/hardware design constraints.

5.1 Limitations

Table 17 Known limitations

Reference	Limitation
Enum input parameter	MCAL does not support negative values for enumeration type. User shall ensure that valid enumeration values are passed for the APIs where arguments of enumeration type are accepted.

Note: For driver specific Deviations and limitations refer to Deviations and limitations section in the respective driver chapters of MCAL User Manual.

5.2 Deviations

Table 18 Known deviations

Module name	Description	Impact on module
Tresos Tool/BMD	The BMD files provided in the package are not fully compliant to AS4.2.2.	Following warnings are observed in the plug-in files: • Software version check: No corresponding BSW-IMPLEMENTATION node for component 'MOD' found. • Vendor ID check: No corresponding BSW-IMPLEMENTATION node for component 'MOD' found. • BSW-IMPLEMENTATION node should exist but was not found. ArMajorVersion/ArMinorVersion/ArPatchVersion/SwMajorVersion/ SwMinorVersion/SwPatchVersion/VendorId should not be set in the CommonPublishedInformation container in AUTOSAR Version 3.x or higher. Parameter maximum value should not be set with the value 'INF' in VSMD.
	Limited variation point support.	Configuration testing with Variation Point Support is limited due to EB tresos tool issue. The tool hangs randomly with the variation points added.
	Multiplicity of the `Wdg/WdgSettingsConfig` container is not valid according to AUTOSAR standard parameter definition.	Since the container multiplicity is dependent on the number of watchdog timers/number of cores for a device. The multiplicity will be from 0 to 5. (According to AUTOSAR it is 1).
	Minimum value of the `Port/PortConfigSet/PortContainer/PortPin/PortPinId` parameter in VSMD (0) may not be smaller than minimum value defined in StMD(1).	As per the AURIX2G hardware, port number starts from 0 to max port. Therefore, the portpinId minimum value is given as 0 in VSMD
	DestinationRef of AUTOSAR reference `Gpt/GptDriverConfiguration/GptClockReferencePoint/GptClockReference` should be `/AUTOSAR/EcucDefs/Mcu/McuModuleConfiguration/McuClockSettingConfig/McuClockReferencePoint`.	The `McuClockReferencePointConfig` container contains the configuration (parameters) for the Clock settings of the MCU. Therefore, the reference is modified as per vendor-specific module definition.

Limitations and deviations

Table 18 Known deviations (continued)

Module name	Description	Impact on module
Tresos Tool/BMD	DefinitionRef of reference `Gpt/GptDriverConfiguration/GptClockReferencePoint/GptClockReference` with origin AUTOSAR_ECUC must start with `/AUTOSAR/EcucDefs/`.	McuClockReferencePointConfig is a non-AUTOSAR param. Therefore, the path should be AURIX2G only.
	Maximum value of the `Pwm/PwmChannelConfigSet/PwmChannel/PwmDutycycleDefault` parameter in VSMD (16777215) may not be larger than maximum value defined in StMD (32768).	To support non-AUTOSAR requirement, that is, PwmDutyShiftInTicks is ON range of Duty parameter should be 24 bit. Therefore, for this parameter max value for range attribute is deviated from AUTOSAR. Refer to the following for additional details: When PwmDutyShiftInTicks is OFF, the value is relative to period. (AUTOSAR range 16 bit) 0- 0x8000 When PwmDutyShiftInTicks is ON, the value is in absolute ticks. (Non-AUTOSAR range 24 bit) 0 to 0x8000, if PwmDutyShiftInTicks is STD_OFF for TOM/ATOM/CCU6 0 to 0xFFFF, if PwmDutyShiftInTicks is STD_ON and the module is TOM, CCU6 0 to 0xFFFFFF, if PwmDutyShiftInTicks is STD_ON and the module is ATOM
	Maximum value of the `Pwm/PwmChannelConfigSet/PwmChannel/PwmPeriodDefault` parameter in VSMD (16777215) may not be larger than maximum value defined in StMD (Inf).	Period input is taken in ticks instead of seconds. Range of Period parameter should be 24 bit. Therefore, for this parameter max value for range attribute is deviated from AUTOSAR. Refer to the following additional details: 0 to 0xFFFF, if module is TOM, CCU6 0 to 0xFFFFFF, if module is ATOM
	According to AUTOSAR standard parameter definition `Pwm/PwmChannelConfigSet/PwmChannel/PwmPeriodDefault` should be ECUC-FLOAT-PARAM-DEF	AUTOSAR insists period value to be given in terms of seconds. But in current PWM implementation period value is given in terms of ticks. Therefore, PwmPeriodDefault type is changed to integer.

Limitations and deviations

Table 18 Known deviations (continued)

Module name	Description	Impact on module
	Multiplicity of the `Pwm/PwmGeneral/PwmDutycycleUpdatedEndperiod` parameter is not valid according to AUTOSAR standard parameter definition.	This parameter decides duty cycle update is coherent (end of cycle)/ non-coherent (immediate) for all PWM channels. This is a non-AUTOSAR requirement to select coherency channel wise. Hence, when channel wise selection is enabled this parameter should be disabled. Therefore, the multiplicity is zero.
Tresos Tool/BMD	Multiplicity of `Pwm/PwmGeneral/PwmPeriodUpdatedEndperiod` parameter is not valid according to AUTOSAR standard parameter definition.	This parameter decides period update is coherent (end of cycle)/ non-coherent (immediate) for all PWM channels. To support non-AUTOSAR requirement to select coherency channel wise. When channel wise selection is enabled this parameter this parameter should be disabled. Therefore, the multiplicity is zero.
	Maximum value of parameter Can/CanConfigSet/CanController/CanControllerBaudrateConfig/CanControllerFdBaudrateConfig/CanControllerTrcvDelayCompensationOffset in VSMD (65535) may not be larger than maximum value defined in StMD (400)	The range of this parameter is extended to support CAN FD baud rates upto 5 MBps as per the requirement for prescalar value greater than 1:1. The change of the limits of the range is extended from 0 to uint16.
	Maximum value of parameter 'Ocu/OcuConfigSet/OcuChannel/OcuHardwareTriggeredAdc' in VSMD (383) may not be larger than maximum value defined in StMD (255).	The ADC driver provided with TC3xx MCAL supports a maximum value of 383 for AdcGroupId. Hence the maximum limit for the OcuHardwareTriggeredAdc parameter range is extended to 383. Note: OcuHardwareTriggeredAdc is only for the visual indication to identify which ADC group is configured (there is no functional impact)
	Maximum value of parameter 'CanTrcv/CanTrcvConfigSet/CanTrcvChannel/CanTrcvMaxBaudrate' in VSMD (5000) may not be larger than maximum value defined in StMD (1000)	Maximum value of parameter 'CanTrcv/CanTrcvConfigSet/CanTrcvChannel/CanTrcvMaxBaudrate' in VSMD (5000) may not be larger than maximum value defined in StMD (1000)

Table 18 Known deviations (continued)

Module name	Description	Impact on module
	Maximum value of parameter 'CanTrcv/ CanTrcvConfigSet/ CanTrcvChannel/ CanTrcvMaxBaudrate' in VSMD (5000) may not be larger than maximum value defined in StMD (1000).	TLE9251V hardware supports HS CAN Standard data rates up to 1MBit/s and CAN FD data rates up to 5 Mbit/s. Hence, the maximum value of CanTrcvMaxBaudrate is set to 5000. The unit is Kbps.
Generic	MCAL treats the DET services to be of "void" return type.	• MCAL treats the DET services Det_ReportError() and Det_ReportRuntimeError() to be of "void" return type. This is an AUTOSAR deviation as AUTOSAR requires the return type to be "Std_ReturnType". • As per AUTOSAR SWS, E_OK shall be the only return value for DET services. For MCAL, MISRA Rule 17.7 violation will be reported for the modules calling the DET services. No functional impact seen.

5.2.1 HIS-MISRA violations

Table 19 MISRA violations due to SFR access / compiler intrinsic functions and AUTOSAR

MISRA_2012_Rule	Rule description	Justification for deviation	Modules applicable
1.3	There shall be no occurrence of undefined or critical unspecified behaviour	This rule violation is agreed as we need to store the address passed in the called function in many scenarios.	Adc, Can_17_McmCan, Fee, Fls_17_Dmu, Icu_17_TimerIp, Ocu, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu
2.2	There shall be no dead code	Values are assigned in assembly instructions. Therefore, they are actually used and not dead code.	Adc, CanTrcv_17_V9251, Dio, Gpt, Icu_17_TimerIp, Mcu, Ocu, Port, Pwm_17_GtmCcu6
2.5	A project should not contain unused macro declarations	Allowed violations as macros used in different configuration.	Can_17_McmCan, Fls_17_Dmu, Icu_17_TimerIp, Lin_17_AscLin, Ocu, Port, Pwm_17_GtmCcu6, Spi
2.7	There should be no unused parameters in functions	Parameters are used in assembly instructions.Therefore, they are actually used.	Adc, Bfx, Dio, Icu_17_TimerIp, McalLib, Mcu, Pwm_17_GtmCcu6
4.6	typedefs that indicate size and signedness should be	Basic numerical type - int/ unsigned int * is used while invoking compiler intrinsic	Fee, Icu_17_TimerIp, McalLib

Table 19 MISRA violations due to SFR access / compiler intrinsic functions and AUTOSAR (continued)

MISRA_2012_Rule	Rule description	Justification for deviation	Modules applicable
	used in place of the basic numerical types	functions. These compiler * intrinsic functions are implemented specific to the TriCoreTM. Hence, to align * with compiler declaration,use of unsigned int is mandatory.	
4.9	A function should be used in preference to a function-like macro where they are interchangeable	Allowed violations in cases where function like macro,'*_GetVersionInfo', and intrinsic macros.	Adc, Bfx, CanTrcv_17_V9251, CanTrcv_17_W9255, Can_17_McmCan, Crc, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu
4.10	Precautions shall be taken in order to prevent the contents of a header file being included more than once	Allowed violations in case where Mod_Memmap.h is repeatedly included without include guard. This is as per AUTOSAR.	Adc, Bfx, CanTrcv_17_V9251, CanTrcv_17_W9255, Can_17_McmCan, Crc, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu
5.1	External identifiers shall be distinct	Allowed violations in cases where external identifiers are going beyond 32 chars(some due to AS naming conventions, some due to module design, but mostly in the generated code.)	Adc, CanTrcv_17_V9251, CanTrcv_17_W9255, Can_17_McmCan, Crc, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu
5.2	Identifers declared in the same scope and name space shall be distinct	Allowed violations in cases where external identifiers are going beyond 32 chars(some due to AS naming conventions, some due to module design, but mostly in the generated code.)	Adc, CanTrcv_17_V9251, CanTrcv_17_W9255, Can_17_McmCan, Crc, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu

Limitations and deviations

Table 19 MISRA violations due to SFR access / compiler intrinsic functions and AUTOSAR (continued)

MISRA_2012_Rule	Rule description	Justification for deviation	Modules applicable
5.4	Macro identifiers shall be distinct	Allowed violations in cases where external identifiers are going beyond 32 chars(some due to AS naming conventions, some due to module design, but mostly in the generated code.)	Adc, CanTrcv_17_V9251, CanTrcv_17_W9255, Can_17_McmCan, Crc, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu
5.5	Identifiers shall be distinct from macro names	Allowed violations in cases where external identifiers are going beyond 32 chars(some due to AS naming conventions, some due to module design, but mostly in the generated code.)	Adc, CanTrcv_17_V9251, CanTrcv_17_W9255, Can_17_McmCan, Crc, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu
8.4	A compatible declaration shall be visible when an object or function with external linkage is defined	Allowed violations for the following intrinsic functions: IMASKLDMST,EXTRACT.	Fee, Fls_17_Dmu, Mcu, Spi
8.7	Functions and objects should not be defined with external linkage if they are referenced in only one translation unit	The extern declaration should be done by the application. Hence, the structure is not made static.	Fee, Spi
8.9	An object should be defined at block scope if its identifier only appears in a single function	Global constants not declared within block scope, but used only in one function. Declaring const inan API scope may lead to confusion.	Adc, CanTrcv_17_W9255, Crc, Gpt, Icu_17_TimerIp, Mcu, Spi
8.13	A pointer should point to a const-qualified type whenever possible	Use of assembly instruction on some address pointers,hence cannot pass them as const.	Adc, Bfx, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6
10.1	Operands shall not be of an inappropriate essential-type	Measurement Mode Default Start Edge Measurement Property Wakeup capability Assigned Hardware Resource Number. Hence,no side effects foreseen by violating this.	Icu_17_TimerIp

Table 19 MISRA violations due to SFR access / compiler intrinsic functions and AUTOSAR (continued)

MISRA_2012_Rule	Rule description	Justification for deviation	Modules applicable
10.3	The value of an expression shall not be assigned to an object with a narrower essential type or of a different essential type category	DataType is defined as enum to differentiate between type of data NORMAL DATA and IMMEDIATE DATA. It is defined as enum to increase the readability of the code such that the values being used could be identified. Changing this will compromise the code maintainability and readability.	Adc, Fee, Mcu, Port, Spi
10.4	Both operands of an operator in which the usual arithmetic conversions are performed shall have the same essential type category	Typecasting is done. Types are same and hence no issue is seen.	Fee, Fls_17_Dmu, Icu_17_TimerIp, Spi
10.5	The value of an expression should not be cast to an inappropriate essential type	DataType is defined as enum to differentiate between type of data NORMAL DATA and IMMEDIATE DATA. It is defined as enum to increase the readability ofthe code such that the values being used could be identified. Changing this will compromise the code maintainability and readability.	Mcu
10.8	The value of a composite expression shall not be cast to a different essential type category or a wider essential type	Impermissible cast of composite expression used for hardware descriptor access. Hence no issues are seen.	Fls_17_Dmu
11.3	A cast shall not be performed between a pointer to object type and a pointer to a different object type	Cast performed between a pointer to object type and a pointer to a different object type due to SFR access.	Can_17_McmCan, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu

Table 19 MISRA violations due to SFR access / compiler intrinsic functions and AUTOSAR (continued)

MISRA_2012_Rule	Rule description	Justification for deviation	Modules applicable
11.4	A conversion should not be performed between a pointer to object and an integer type	Allowed violations in cases where rule is violated for SFR access only.	Adc, Can_17_McmCan, Fls_17_Dmu, McalLib, Mcu, Spi
11.5	A conversion should not be performed from pointer to void into pointer to object	Allowed violations as internal function performs initialization at 1 byte at atime. For such operations,the pointer type conversion is required.	Dio, Gpt, Icu_17_TimerIp, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi
11.6	A cast shall not be performed between pointer to void and an arithmetic type	Allowed violations for SFR access only.	Adc, Can_17_McmCan, Fls_17_Dmu, McalLib, Mcu, Spi
11.8	A cast shall not remove any const or volatile qualification from the type pointed to by a pointer	Allowed violation for SFR access only and the solution gives compile time warning with different compilers.	Adc, Fee, Fls_17_Dmu, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Port, Pwm_17_GtmCcu6, Spi
13.2	The value of an expression and its persistent side effects shall be the same under all permitted evaluation orders	No side effects foreseen. This rule violation is agreed as we need to store the address passed in the called function in many scenarios.	Fls_17_Dmu
13.5	The right hand operand of a logical && or || operator shall not contain persistent side effects	SFR register which is volatile is used to check for condition directly. It is checked in the timeout count while loop. The checked value does not keep changing. It is checked only for transition from 0 to 1. Hence, it is not an issue.	Crc, Fls_17_Dmu
15.4	There should be no more than one break or goto statement used to terminate any iteration statement	Terminating the loop is required since every element needs to be checked before inserting in the Queue.	Spi
18.1	A pointer resulting from arithmetic on a pointer operand shall address an element of the same array as that pointer operand	The timer values are read from status register and, therefore, the value of timer is within range.	Adc, Crc, Fee

Table 19 MISRA violations due to SFR access / compiler intrinsic functions and AUTOSAR (continued)

MISRA_2012_Rule	Rule description	Justification for deviation	Modules applicable
18.4	The +, -, += and -= operators should not be applied to an expression of pointer type	Allowed violation in cases where pointer arithmetic other than array indexing is used.	Adc, Dio, Fee, Fls_17_Dmu, Gpt, Mcu, Ocu, Port
19.2	The union keyword should not be used	Allowed violation in cases where pointer arithmetic other than array indexing is used for SFR access.	Adc, Can_17_McmCan, Gpt, Icu_17_TimerIp, Mcu, Spi, Wdg_17_Scu
20.1	#include directives should only be preceded by preprocessor directives or comments	Allowed violations in cases where declaration before #include memap.h as per AUTOSAR.	Adc, Bfx, CanTrcv_17_V9251, CanTrcv_17_W9255, Can_17_McmCan, Crc, Dio, Fee, Fls_17_Dmu, Gpt, Icu_17_TimerIp, Lin_17_AscLin, McalLib, Mcu, Ocu, Port, Pwm_17_GtmCcu6, Spi, Wdg_17_Scu
20.10	The # and ## preprocessor operators should not be used	Function like macro used to call the TricoreTM intrinsic function, and reviewed to confirm no side effects.	McalLib

6 Support packages

Attention: ***The following information is given for evaluation purposes only. Modifications to these packages are made at your own risk.***

6.1 Build environment

Table 20 Build environment

Folder name	Description
Tools\ Bifaces	Contains tools for the Build environment

6.1.1 Open source software

The `Tools\Bifaces` folder contains items that are governed by Open Source Software.

The following table lists details related to copyright information, licensing terms and additional information (for example, how to obtain the source code of such Open Source Software).

Table 21 Bifaces and tools

Folder name	Copyright and licensing details
`bin`	Contains GNU tools. GNU General Public License, version 2 (GPLv2): ***https://www.gnu.org/licenses/old-licenses/gpl-2.0.en.html*** GNU General Public License, version 3 (GPLv3): ***https://www.gnu.org/licenses/gpl.html***
`DocTools\doxygen`	Contains Doxygen tool. GNU General Public License, version 2 (GPLv2): ***https://www.gnu.org/licenses/old-licenses/gpl-2.0.en.html***
`DocTools\Graphviz`	Contains Graph tool. Common Public License, version 1.0 (CPL-1.0) ***https://opensource.org/licenses/cpl1.0.php***

`Php\license.txt`
`Php\php.exe`
`Php\php5.dll`
	Contains PHP script interpreter.
	PHP License, version 3.01
	http://php.net/license/3_01.txt

6.2 Example demo application

These files contain the TC3xx demo routines. The following table describes different folders/files.

Table 22 Demo workspace

Folder / file name	Description
`\DemoWorkspace\McalDemo\<device>\0_Src`	Contains the source files needed to run the Demo application

Support packages

Table 22 Demo workspace (continued)

Folder / file name	Description
\DemoWorkspace\McalDemo\<device>\1_ToolEnv	Contains the tools necessary to build the Demo application
DemoAppBuild.bat	Batch file that can be used to build the Demo application

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