
RTA-OS TriCore/Tasking

Release Note - Version 5.0.20 (16-01-2021)

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1 Introduction

RTA-OS is an AUTOSAR compliant Operating System and associated tooling. This document provides release information for the RTA-OS TriCore/Tasking port plug-in that customizes the RTA-OS development tools for the Infineon TriCore with the Tasking compiler. It supplements the more general information you can find in the *Release Note*.

1.1 Version Information

This is Version 5.0.20 of the RTA-OS TriCore/Tasking plug-in.

1.2 Installation

The installation process is covered in detail in the *TriCoreTasking Port Guide*.

2 **Open EHI Calls**

Open issues are referred to by their call number in the ETAS Helpdesk International (EHI) system.

No EHI calls are open.

3 Change History

3.1 Version 5.0.20

Additional Features

The following features have been added to this release:

- Tested on compiler v6.2r2p4
- Tested on compiler v5.0r2p3
- Added TC32x variant with same features as TC33x
- Code for option 'Guard supervisor access' has been strengthened to prevent inadvertent leaking of the key value outside OS APIs.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.2 Version 5.0.19

Additional Features

The following features have been added to this release:

- Added target option 'Customer Option Set 4' to select a specific set of compiler options. Requested by a customer for a particular project and not supported elsewhere.
- Added target option 'Customer Option Set 5' to select a specific set of compiler options. Requested by a customer for a particular project and not supported elsewhere.
- Added TC3EX variant based on data sheets, and not tested on real hardware.

Modified Features

The following features have been modified in this release:

- The TC33x data was updated to Infineon version V1.3.0.
- The startup code in the target samples was adjusted to match changes in the cstart.file in the v6.3r1 compiler.
- The compiler options in the target samples were adjusted to take account of the detected compiler version.

Removed Features

No features have been removed from this release.

3.3 Version 5.0.18

Additional Features

The following features have been added to this release:

- Added support for compiler v6.3r1

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.4 Version 5.0.17 (Preview Release)

Additional Features

The following features have been added to this release:

- Added TC33x and TC33xEXT variants based on data sheets, and not tested on real hardware.
- Support up to 3 PSW.PRS bits in the 'Trusted with protection PRS' target option.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.5 Version 5.0.16 (Preview Release)

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- Improved packing of small IOC data elements.
- Updated TC35x, TC36x, TC37x, TC38x, TC39xB variants from new chip information.

Removed Features

No features have been removed from this release.

3.6 Version 5.0.15

Additional Features

The following features have been added to this release:

- Added target option 'Customer Option Set 3' to select a specific set of compiler options. Requested by a customer for a particular project and not supported elsewhere. Options may not be available on compiler versions before v6.2.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.7 Version 5.0.14

Additional Features

The following features have been added to this release:

- Added support for compiler v6.2r2p2
- Added TC36x variant based on data sheets, and not tested on real hardware.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.8 Version 5.0.13

Additional Features

The following features have been added to this release:

- Added TC35x variant. Tested on TC35x development board.
- Added TC37x variant based on data sheets, and not tested on real hardware.

Modified Features

The following features have been modified in this release:

- The 'mcpu override' target option can be used with 'Customer Option Set 2' to override the default cpu type for compilation.

Removed Features

No features have been removed from this release.

3.9 Version 5.0.12 (Preview Release)

Additional Features

The following features have been added to this release:

- Added target option 'Customer Feature Set'.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.10 Version 5.0.11

Additional Features

The following features have been added to this release:

- Tests have been run on TC399 B-step hardware.
- Added support for compiler v6.2r1p4
- Added target option 'Customer Option Set 2' to select a specific set of compiler options. Requested by a customer for a particular project and not supported elsewhere.
- Support for TC21x. Tested on real hardware.

Modified Features

The following features have been modified in this release:

- Corrected the SRC_DAM1 peripheral addresses for the TC39xB variant.

Removed Features

The following features have been removed from this release:

- Removed support for compiler v6.2r1p3

3.11 Version 5.0.10

Additional Features

The following features have been added to this release:

- Added support for compiler v6.2r1p3
- Tested TC22x variant on real hardware.
- Tests have been run on TC38x hardware, using updated register definitions from Infineon and corrected configuration values.
- Added TC39xB variant based on data sheets, and not tested on real hardware.
- Supports AUTOSAR 4.3.0 InterruptSource APIs.

Modified Features

No features have been modified in this release.

Removed Features

The following features have been removed from this release:

- Removed support for compiler v6.2r1p1

3.12 Version 5.0.9

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- The compilation options for TC39x and TC38x have been updated to be more chip specific when the v6.2r1 compiler is used. TC27x compatible options are used with earlier compiler versions.
- TC22x has now been tested on real hardware.

Removed Features

No features have been removed from this release.

3.13 Version 5.0.8 (Preview Release)

Additional Features

The following features have been added to this release:

- Added support for compiler v6.2r1p1
- Added 'EABI 3.0' target option for compiler v6.2r1 so that backwards compatibility can be maintained with earlier compilers.
- Support for TC22x based on data sheets, and not tested on real hardware.
- Support for TC23xADAS based on data sheets, and not tested on real hardware.
- Support for TC38x based on data sheets, and not tested on real hardware.
- Preliminary testing on TC39x A-step hardware.

Modified Features

The following features have been modified in this release:

- Modify allocation algorithm for SRC registers in cross-core interrupts to take proper account of the CrossCore SRC target option.

Removed Features

No features have been removed from this release.

3.14 Version 5.0.7 (Preview Release)

Additional Features

The following features have been added to this release:

- Supports RTA-OS features (Async activation / TrustedWithProtection)
- Preliminary support for TC22x based on early data sheets, and not tested on real hardware.

Modified Features

The following features have been modified in this release:

- Category 2 and cross-core interrupt handlers use per-core code.

Removed Features

No features have been removed from this release.

3.15 Version 5.0.6

Additional Features

The following features have been added to this release:

- Added support for compiler v6.0r1
- Added target option 'Customer Option Set 1' to select a specific set of compiler options. Requested by a customer for a particular project and not supported elsewhere.

Modified Features

The following features have been modified in this release:

- TC39x updated to A-step.

Removed Features

The following features have been removed from this release:

- Removed support for TC2Dx device

3.16 Version 5.0.5

Additional Features

The following features have been added to this release:

- Addition of 'Integer enums' target option
- Support the winIDEA debugger / analyzer
- Tracking of Category 1 ISRs via ORTI
- Supports ORTI stack usage measurements
- The target option 'ORTI Stack Fill' has been added to support debugger calculation of application stack usage using the ORTI details.
- Addition of 'Enable stack repositioning' target option
- Addition of Os_IntChannel_x macro
- Very preliminary support for Aurix+ (TC39x). Library is built based on TC27x settings. Linking not supported with current compilers.

Modified Features

The following features have been modified in this release:

- TC29xB and TC27x variants have updated registers based on latest Infineon data.

Removed Features

No features have been removed from this release.

3.17 Version 5.0.4

Additional Features

The following features have been added to this release:

- Addition of 'OS Locks disable Cat1' target option. This can be used to specify that all interrupts are disabled while internal OS spinlocks are held. This does not affect spinlocks accessed using the GetSpinlock or TryToGetSpinlock APIs.
- Tested on compiler v5.0r2 Build 904.1.1
- Tested on compiler v4.3r2 Build 759
- Tested on compiler v4.2r2 Build 744.2.1
- Tested on compiler v4.2r2 Build 744.1.1

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.18 Version 5.0.3

Additional Features

The following features have been added to this release:

- A target option has been added to add extra security checks to the syscall(0) trap handler to validate that the caller is the OS. Use '-target_option:Guard supervisor access=true'
- Information about unhandled traps can be obtained by calling the new Os_GetTrapInfo() API from ProtectionHook.
- The new target option 'Interrupt vector matches priority' can be used to override the default SRC.SRPN allocation strategy for interrupts. When this is 'true', SRC.SRPN values match the declared interrupt priority.

Modified Features

The following features have been modified in this release:

- The OS only intercepts the System Call Trap Handler if it is called with TIN=0. Otherwise it processes it like the other traps.

Removed Features

No features have been removed from this release.

3.19 Version 5.0.2

Additional Features

The following features have been added to this release:

- Support for V4.2r2/V4.2r2p2 compiler
- Support for TC23x devices

Modified Features

The following features have been modified in this release:

- Interrupt vectors support 32-bit jumps to handlers. (Target option 'Far jumps')
- Untrusted code can use PSW.IO setting 'User-0' or 'User-1'. (Target option 'User Mode')
- Manipulation of ICR values in OS APIs has been optimized
- Category 2 interrupt exit code has been adjusted for TC2x devices so that fast interrupt mode gets re-enabled before return from interrupt
- For multicore systems, each OS core has its own Category 2 ISR handler

Removed Features

No features have been removed from this release.

3.20 Version 5.0.1

Additional Features

The following features have been added to this release:

- Added support for TC26x device
- Added support for TC29x device
- Added `-eabi-compliant` build option
- Support for V4.2r2 compiler
- Support `Os_Disable_x`, `Os_Enable_x`, `Os_DisableAllConfiguredInterrupts` and `Os_EnableAllConfiguredInterrupts` macros

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.21 Version 5.0.0

Additional Features

The following features have been added to this release:

- Release version

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.22 Version 4.99.4

Additional Features

The following features have been added to this release:

- Added back selected single-core target variants (TC1387, TC1728, TC1736, TC1767, TC1784, TC1797, TC1798)

Modified Features

No features have been modified in this release.

Removed Features

The following features have been removed from this release:

- Support for TC2Dx is removed
- Support for other single-core variants is removed
- Support for the V3 compiler versions is dropped

3.23 Version 4.99.3

Additional Features

The following features have been added to this release:

- Early access support for V4.0r1 compiler
- Early access support for TC27xA
- Supports user-defined trap handlers

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.24 Version 4.99.2

Additional Features

The following features have been added to this release:

- Preparing support for user-defined trap handlers

Modified Features

The following features have been modified in this release:

- Embedded SFR definitions back into OS sources - generated from Infineon reference documents
- Command-line options synchronized with customer request

Removed Features

No features have been removed from this release.

3.25 Version 4.99.1

Additional Features

The following features have been added to this release:

- Early access support for V4.0r0 compiler

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.26 Version 4.99.0

Additional Features

The following features have been added to this release:

- Early access support for V4.0rb3 compiler and TC2Dx only

Modified Features

The following features have been modified in this release:

- Incorporates initial support for 1.6E/P cores
- Use of 'INIT' flag for interrupts and traps has been moved to a target-specific option

Removed Features

The following features have been removed from this release:

- Support for all other chip variants has been temporarily removed

3.27 Version 2.2.2

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- Updated lint support, including PC Lint version 9

Removed Features

No features have been removed from this release.

3.28 Version 2.2.1

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- Added 'INIT' flag to interrupts and traps when selecting Standalone link configuration (not InTRAM)

Removed Features

No features have been removed from this release.

3.29 Version 2.2.0

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- Supports compiler V3.5r1

Removed Features

No features have been removed from this release.

3.30 Version 2.1.0

Additional Features

The following features have been added to this release:

- Incorporates support for 1.6 cores

Modified Features

The following features have been modified in this release:

- Supports compiler V3.4r1

Removed Features

No features have been removed from this release.

3.31 Version 2.0.0

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- Final release

Removed Features

No features have been removed from this release.

3.32 Version 1.99.5

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- Changed license key name

Removed Features

No features have been removed from this release.

3.33 Version 1.99.4

Additional Features

The following features have been added to this release:

- Initial beta release

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

4 Fixed EHI Calls

Bugs that have been fixed are referred to by their call number in the ETAS Helpdesk International (EHI) system.

4.1 Version 5.0.19

EHI 633205

Status: Fixed

Title: Missing header file for TC33x

Description: The header file `_TC33x.h` was previously not created during OS builds but it was created for target samples. As a workaround, the file generated in the target samples could be used.

EHI 636283

Status: Fixed

Title: Possible data write reordering involving spinlocks and data updates.

Description: Infineon have released application hint `CPU_TC.H019` in the Errata Sheet for the TC39x that suggests that reordering of data writes can occur in configurations where 2 data items are located in different memory modules. There is a small possibility that this could affect data protected by OS spinlocks. The effect would be that the data being protected by the spinlock might appear to change immediately after the spinlock release, rather than before. A core could therefore read stale data. This has the potential to affect any TC2xx or TC3xx part. To remove this risk, the OS spinlock release code now has an extra `dsync` instruction in a position recommended in `CPU_TC.H019`.

4.2 Version 5.0.17 (Preview Release)

EHI 625089

Status: Fixed

Title: Inconsistent compiler options

Description: The compilation options `-Op` and `-OP` were both used in the default compiler options. The `-OP` counteracts the `-Op`. It has been removed.

4.3 Version 5.0.14

EHI 607369

Status: Fixed

Title: Compiler warnings with target option Customer Feature Set

Description: There were a couple of 'implicit declaration' warnings during compilation of Customer Feature Set code.

4.4 Version 5.0.8 (Preview Release)

EHI 562133

Status: Fixed

Title: Possible Lint message 737 with RES_SCHEDULER on TC39x

Description: The definition of the OS_MFCR macro has been adjusted to add a cast of its return type to uint32. The OS always reads this register into unsigned values.

4.5 Version 5.0.7 (Preview Release)

EHI 552690

Status: Fixed

Title: In 5.0.6, the installer might fail to access the Windows registry unless run by an Administrator account.

Description: The installer behavior has been reverted to match previous versions.

4.6 Version 5.0.5

EHI 457974

Status: Fixed

Title: Memory protection of stack for untrusted code might need extra padding.

Description: The memory protection hardware on the Tricore only checks start addresses, so a 64-bit write to the last 32 bits of a protected section can write past the end of the section. Untrusted code could therefore overwrite 4 bytes of stack from its caller. The 'Enable stack repositioning' target option can be used, if desired, to adjust the stack area assigned to untrusted code to ensure extra safety padding is allocated.

EHI 498310

Status: Fixed

Title: Change to disabling of interrupts

Description: The macros in Os_DisableInterrupts.h that disable interrupt sources now manipulate the SRE bit instead of changing the interrupt priority.

4.7 Version 5.0.4

EHI 452135

Status: Fixed

Title: The version of the control program (cctc) was shown in the Port Guide

Description: The version of the compiler (ctc) is shown in the Port Guide

4.8 Version 5.0.1

EHI 359830

Status: Fixed

Title: The sample applications now use the PLL clock rather than the backup clock, so the clock rate is more accurate.

Description:

EHI 369218

Status: Fixed

Title: With untrusted OS Applications in the configuration, the code for longjmp previously failed to switch from untrusted to trusted code reliably.

Description:

5 Limitations

5.1 Installer

There are the following limitations for the installer:

Limitation None.

Workaround None.

5.2 TriCoreTasking DLL

There are the following limitations for this tool:

Limitation TC27xA: There may be data coherency issues if the OS data used for synchronizing the cores is placed in LMURAM and DCACHE is enabled. The OS may not start because cores see data from cache rather than from the RAM.

Workaround The OS data may be placed in the DSPR memory belonging to one of the cores.

6 Contacting ETAS

6.1 Technical Support

Technical support is available to all users with a valid support contract. If you do not have a valid support contract, please contact your regional sales office (see below).

The best way to get technical support is by email. Any problems or questions about the use of the product should be sent to:

`rta.hotline@etas.com`

If you prefer to discuss your problem with the technical support team, you call the support hotline on:

+44 (0)1904 562624.

The hotline is available during normal office hours (0900-1730 GMT/BST).

In either case, it is helpful if you can provide technical support with the following information:

- Your support contract number
- The version of the ETAS tools you are using
- The version of the compiler tool chain you are using
- The command line (or reproduction of steps) that result in an error message
- The error messages or return codes you received (if any)
- Your `.xml`, `.arxml` and `.rtaos` files
- The file `Diagnostic.dmp` if it was generated

6.2 General Enquiries

6.2.1 ETAS Global Headquarters

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6.2.2 ETAS Local Sales & Support Offices

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