
RTA-OS TriCore/HighTec

Release Note - Version 5.0.22 (25-02-2019)

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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/HighTec port plug-in that customizes the RTA-OS development tools for the Infineon TriCore with the HighTec compiler. It supplements the more general information you can find in the *Release Note*.

1.1 Version Information

This is Version 5.0.22 of the RTA-OS TriCore/HighTec plug-in.

1.2 Installation

The installation process is covered in detail in the *TriCoreHighTec 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 5.0.22

Additional Features

The following features have been added to this release:

- Added TC36x variant based on data sheets, and not tested on real hardware.
- 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.

3.2 Version 5.0.21

Additional Features

The following features have been added to this release:

- Tests have been run on TC35x hardware.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.3 Version 5.0.20

Additional Features

The following features have been added to this release:

- Added TC21x variant. Tested on TC21x development board.
- Support for TC35x based on data sheets, and not tested on real hardware.
- Support for TC37x 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.

3.4 Version 5.0.19

Additional Features

The following features have been added to this release:

- Supports V4.6.4.0, V4.6.5.0, V4.6.6.0, V4.6.6.1 and V4.9.2.0 compiler versions.
- 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

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.5 Version 5.0.18

Additional Features

The following features have been added to this release:

- Tests have been run on TC399 B-step hardware.

Modified Features

The following features have been modified in this release:

- Corrected the SRC_DAM1 peripheral addresses for the TC39xB variant.

Removed Features

No features have been removed from this release.

3.6 Version 5.0.17

Additional Features

The following features have been added to this release:

- 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

The following features have been modified in this release:

- TC22x has now been tested on real hardware.

Removed Features

No features have been removed from this release.

3.7 Version 5.0.16

Additional Features

The following features have been added to this release:

- Support for TC38x 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 5.0.15

Additional Features

The following features have been added to this release:

- Target option to select between -Os and -O2 optimization levels.

Modified Features

No features have been modified in this release.

Removed Features

The following features have been removed from this release:

- The option 'Enhanced Isolation' was previously documented, but it is not available for this target port.

3.9 Version 5.0.14

Additional Features

The following features have been added to this release:

- Preliminary support for TC22x based on early 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.

3.10 Version 5.0.13 (Preview Release)

Additional Features

The following features have been added to this release:

- This is a update to the preview version 5.0.12 that matches the RTA-OS preview version version 5.5.7.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.11 Version 5.0.12 (Preview Release)

Additional Features

The following features have been added to this release:

- This is a preview version that has preliminary support for OS Applications with TrustedApplicationWithProtection set. This behavior is available in RTA-OS from version 5.5.6.
- The target options 'CrossCore SRC3', 'CrossCore SRC4' and 'CrossCore SRC5' have been added so that all cores of the TC39x can have the SRC used for the cross-core interrupt specified.

Modified Features

The following features have been modified in this release:

- TC39x is fully tested using programs in both RAM and FLASH.
- The stub code generated for interrupts when the OS is not generating a vector table has been modified to place each stub into a separate memory section. This can be used to optimize the location in memory of the stubs.

Removed Features

The following features have been removed from this release:

- Remove support for TC2Dx chip

3.12 Version 5.0.11

Additional Features

The following features have been added to this release:

- Supports V4.6.4.0, V4.6.5.0, V4.6.6.0 and V4.6.6.1 compiler versions.

Modified Features

The following features have been modified in this release:

- The TC23x, TC23xadas and TC39x had spurious GTM_ prefixed interrupt sources in the last release
- Updated support of the TC39x to the A-Step hardware. Passing all tests when run in RAM, may be issues with clock speed in FLASH.

Removed Features

No features have been removed from this release.

3.13 Version 5.0.10

Additional Features

The following features have been added to this release:

- Supports V4.6.4.0, V4.6.5.0 and V4.6.6.0 compiler versions.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.14 Version 5.0.9

Additional Features

The following features have been added to this release:

- Released version.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.15 Version 5.0.8

Additional Features

The following features have been added to this release:

- Very preliminary support for Aurix+ (TC39x). Interrupts and multicore tests seen to work using simulator.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.16 Version 5.0.7

Additional Features

The following features have been added to this release:

- Support the winIDEA debugger / analyzer
- Tracking of Category 1 ISRs via ORTI
- Supports ORTI stack usage measurements
- Addition of 'Enable stack repositioning' target option
- Addition of 'Small const threshold' target option
- Addition of 'Small data threshold' target option
- Addition of Os_IntChannel_x macro

Modified Features

The following features have been modified in this release:

- Speed up OS object validation code

Removed Features

No features have been removed from this release.

3.17 Version 5.0.6

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.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.18 Version 5.0.5

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 5.0.4

Additional Features

The following features have been added to this release:

- CAT1_TRAP macro has been added for portability with other targets. It should be used to implement your own trap handlers

Modified Features

The following features have been modified in this release:

- Supports the V4.6.4.x and V4.6.5.x compiler versions (only)
- Ensure fast interrupts get re-enabled before rfe
- Compile with options `-ffunction-sections`, `-fdata-sections` and `-mpragma-data-sections`
- Spinlock, Category 2 and cross-core ISR code moved to 'OS_CODE_FAST' memory

Removed Features

No features have been removed from this release.

3.20 Version 5.0.3

Additional Features

The following features have been added to this release:

- Supports V4.6.4.0 compiler (additional)
- Supports the '`-fstack-usage`' compiler option. Use '`-target_option:emit stack usage=true`'
- Add option for far jumps for interrupt handlers. Use '`-target_option:Far jumps=true`'

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.21 Version 5.0.2

Additional Features

The following features have been added to this release:

- Full support for TC27XC, TC26X and TC29X
- Target option 'User Mode' added so that untrusted code can run in User-1 mode.

Modified Features

The following features have been modified in this release:

- Updated to add V4.6.3.1 compiler

Removed Features

No features have been removed from this release.

3.22 Version 5.0.1

Additional Features

The following features have been added to this release:

- Preliminary (untested) support for TC26X
- Preliminary (untested) support for TC29X

Modified Features

The following features have been modified in this release:

- Remove cross-core interrupts from the `Os_DisableAllConfiguredInterrupts / Os_EnableAllConfiguredInterrupts` macros

Removed Features

No features have been removed from this release.

3.23 Version 5.0.0

Additional Features

The following features have been added to this release:

- Tested with the TC275B
- Supports the 4.6.2 compiler (only)
- User trap handlers that are implemented using the CAT1_ISR macro can continue processing when the handler returns, so long as the original reason for the trap has been removed.
- Trap handlers that start b_(name) are branched to directly, with no other processing (normal trap handlers execute svlcx first so that the CAT1_ISR macro will exit correctly).
- Macros are provided to enable and disable configured interrupts by directly manipulating the SRC registers.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.24 Version 4.99.4

Additional Features

No features have been added to this release.

Modified Features

No features have been modified in this release.

Removed Features

The following features have been removed from this release:

- Removed 'default' link option

3.25 Version 4.99.3

Additional Features

The following features have been added to this release:

- TC2Dx added back

Modified Features

The following features have been modified in this release:

- Switch to support the v4.6.1.4 (only) compiler

Removed Features

No features have been removed from this release.

3.26 Version 4.99.2

Additional Features

The following features have been added to this release:

- Single core variants put back, generic variants added
- Cross-core interrupt SFRs can be configured

Modified Features

The following features have been modified in this release:

- Switch to support the v4.6.1.2 compiler (only) - only tested on TC27x for this release

Removed Features

The following features have been removed from this release:

- Removed support for v3 compiler
- TC2Dx removed

3.27 Version 4.99.1

Additional Features

The following features have been added to this release:

- Early access support for TC27x

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.28 Version 4.99.0

Additional Features

The following features have been added to this release:

- Early access support for TC2Dx only (3 cores)

Modified Features

The following features have been modified in this release:

- Incorporates initial support for 1.6E/P cores

Removed Features

The following features have been removed from this release:

- Support for all other chip variants has been temporarily removed

3.29 Version 2.0.4

Additional Features

The following features have been added to this release:

- Adds single core support for the AURIX parts TC2Dx and TC27x.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.30 Version 2.0.3

Additional Features

The following features have been added to this release:

- Supports 3.4.5.6 compiler toolchain.
- Os_Wrapper.c does not get created unless there are Category 2 ISRs.
- The size of the vector table will be limited to 4/16/64 or 256 entries, based on the highest interrupt priority. Refer to the CARBCYC register setting.
- CAT1 interrupts can be placed on Traps. However be careful not to disrupt the behavior of the OS in configurations that support untrusted OS applications.

Modified Features

The following features have been modified in this release:

- Internal assembler source files changed to C files with embedded assembler code.

Removed Features

No features have been removed from this release.

3.31 Version 2.0.1

Additional Features

No features have been added to this release.

Modified Features

The following features have been modified in this release:

- Split the interrupt table and trap table into two separate source files. Demand-linking can override traps while retaining the interrupts.

Removed Features

No features have been removed from this release.

3.32 Version 2.0.0

Additional Features

The following features have been added to this release:

- Version 2.0.0 release

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.33 Version 1.99.2

Additional Features

The following features have been added to this release:

- Beta release. SC1,2,3,4.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.34 Version 1.0.0

Additional Features

No features have been added to this release.

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.35 Version 0.9.3

Additional Features

The following features have been added to this release:

- Second beta release - 3.4.5.1.2 compiler

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

3.36 Version 0.9.1

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 5.0.21

EHI 602815

Status: Fixed
Title: Compile error with Customer Option Set 1
Description: There was a compilation error when Customer Option Set 1 was used in a system with Category 1 interrupts and user-supplied vectors, except with the V4.9.2.0 compiler. Such code will now compile with all supported compiler versions

4.2 Version 5.0.15

EHI 553483

Status: Fixed
Title: Compilation failure in Os_wrapper.c (Version 5.0.14 with RTA-OS versions before 5.5.8 only)
Description: There was an issue in the code that was detecting the OS version. This has been fixed.

EHI 553718

Status: Fixed
Title: Handling of PSW.PRS/IO bits
Description: The description in the Port Guide relating to the PRS and IO bits was incorrect and misleading. The operation of the 'Trusted with protection PRS' option was incorrect.

EHI 554882

Status: Fixed
Title: OS APIs not changing to Trusted modes
Description: OS APIs were not switching to use the fully trusted PSW.PRS setting if called from 'Trusted with protection'.

4.3 Version 5.0.14

EHI 548239

Status: Fixed
Title: Compile fail with user-generated vector table and Far jumps=true
Description: For the 5.0.13 preview, some newlines were omitted from the support code for interrupts causing compilation to fail.

4.4 Version 5.0.11

EHI 498309

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.

4.5 Version 5.0.10

EHI 494409

Status: Fixed

Title: Compile fail in `Os_Vectors.c`

Description: A compilation failure could occur in `Os_Vectors.c` if the target option 'Far jumps' was enabled at the same time as 'Suppress Vector Table Generation'.

4.6 Version 5.0.8

EHI 473632

Status: Fixed

Title: Duplicate implementation of `Os_UnhandledTrap`

Description: There were two instances of the `Os_UnhandledTrap` function in the RTAOS library. (Both contained the same code, so it does not matter which instance was selected by the linker.)

4.7 Version 5.0.3

EHI 392843

Status: Fixed

Title: Suppress Vector Table Generation

Description: When 'Suppress Vector Table Generation' was TRUE in multicore systems, the interrupt handler code was not generated correctly. In particular, the cross-core interrupt handlers would not compile.

EHI 393423

Status: Fixed

Title: `__asm__`

Description: Code changed to use `__asm__` in preference to `asm`

4.8 Version 5.0.0

EHI 359830

Status: Fixed

Title: Sample application clocks

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

4.9 Version 1.0.0

EHI 249113

Status: Fixed

Title: memset called but not in library

Description: The memset function can not be used with the current toolchain.

EHI 249114

Status: Fixed

Title: HelloWorld will not link with default clock rates

Description: Cast added to avoid need for floating point libraries.

EHI 249115

Status: Fixed

Title: Linker control file

Description: The linker control file was not in the expected folder for the Hello World Example.

5 Limitations

5.1 TriCore 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. |
| Limitation | The sample linker file and startup code is based on earlier compiler versions, so may not be optimal for the 4.6.2 compiler. |
| Workaround | Use these files as a quick guide to getting started only. |
| Limitation | (1.3.x cores only) You might not be able to use the linker option -nostdlib with applications instrumented for RTA-TRACE. (Possible undefined reference to __udivmodsi4) |
| Workaround | You can either supply your own implementation of __udivmodsi4, or omit the -nostdlib option. |

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 Section 6.2.2).

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.uk@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
- Your .xml, .arxml, .rtaos and/or .stc files
- The command line which caused the error
- The version of the ETAS tools you are using
- The version of the compiler tool chain you are using
- The error message you received (if any)
- 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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