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## RTA-OS V850E2/GHS

Release Note - Version 2.0.24 (17-11-2016)

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## **Safety Notice**

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This ETAS product fulfills standard quality management requirements. If requirements of specific safety standards (e.g. IEC 61508, ISO 26262) need to be fulfilled, these requirements must be explicitly defined and ordered by the customer. Before use of the product, customer must verify the compliance with specific safety standards.

# Contents

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<b>1</b>	<b>Introduction</b>	<b>5</b>
1.1	Version Information . . . . .	5
1.2	Installation . . . . .	5
<b>2</b>	<b>Open EHI Calls</b>	<b>6</b>
<b>3</b>	<b>Change History</b>	<b>7</b>
3.1	Version 2.0.24 . . . . .	7
3.2	Version 2.0.23 . . . . .	8
3.3	Version 2.0.22 . . . . .	8
3.4	Version 2.0.21 . . . . .	9
3.5	Version 2.0.20 . . . . .	9
3.6	Version 2.0.10 . . . . .	10
3.7	Version 2.0.0 . . . . .	10
3.8	Version 1.99.4 . . . . .	11
3.9	Version 1.99.3 . . . . .	11
3.10	Version 1.99.2 . . . . .	12
3.11	Version 1.99.1 . . . . .	12
3.12	Version 1.99.0 . . . . .	12
<b>4</b>	<b>Fixed EHI Calls</b>	<b>13</b>
4.1	Version 2.0.24 . . . . .	13
4.2	Version 2.0.22 . . . . .	14
4.3	Version 2.0.21 . . . . .	14
<b>5</b>	<b>Limitations</b>	<b>15</b>
5.1	Installer . . . . .	15
5.2	V850E2GHS DLL . . . . .	15
<b>6</b>	<b>Contacting ETAS</b>	<b>16</b>
6.1	Technical Support . . . . .	16
6.2	General Enquiries . . . . .	16
6.2.1	ETAS Global Headquarters . . . . .	16
6.2.2	ETAS Local Sales & Support Offices . . . . .	16

# 1 Introduction

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RTA-OS is an AUTOSAR compliant Operating System and associated tooling. This document provides release information for the RTA-OS V850E2/GHS port plug-in that customizes the RTA-OS development tools for the Renesas V850E2 with the GREENHILLS compiler. It supplements the more general information you can find in the *Release Note*.

## 1.1 Version Information

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This is Version 2.0.24 of the RTA-OS V850E2/GHS plug-in.

## 1.2 Installation

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The installation process is covered in detail in the *V850E2GHS Port Guide*.

## **2** **Open EHI Calls**

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

No EHI calls are open.

## 3 **Change History**

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### 3.1 Version 2.0.24

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#### **Additional Features**

The following features have been added to this release:

- Sixth full release.
- Support for Trusted-with-Protection.
- Tests are now made to determine possible conflicts between configured interrupts and any interrupts required by the OS.

#### **Modified Features**

The following features have been modified in this release:

- Tested on the V850E2M and V850E2S chip variants using Green Hills Compiler compiler version v5.1.7D-P20.
- Updated to run with the RTA-OS tools release (v5.5.8) and tests.
- The code to support the 'enable stack repositioning' target option has been updated. When dealing with Tasks, ISRs, untrusted functions and untrusted hooks both the repositioned and normal code no longer relies on values stored in the CPU general purpose registers to be preserved over the call to untrusted code.
- Updated to add fix for EHI issue 485847.
- Updated to add fix for EHI issue 495722.
- Updated to add fix for EHI issue 538711.
- Updated to add fix for EHI issue 550148.
- The support for stack and execution time measurement has been updated to prevent a possible miscalculation when a higher priority Category 2 interrupt occurs during the calculations.

#### **Removed Features**

No features have been removed from this release.

## 3.2 Version 2.0.23

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### **Additional Features**

The following features have been added to this release:

- Fifth full release.
- Raw exception handlers 'b\_' supported on CPU exceptions (not supported on maskable EI interrupts).
- Target option to allow the default interrupt to be run at a low IPL.

### **Modified Features**

The following features have been modified in this release:

- Details added to the user guide on raw exception handlers and default interrupt usage.
- Rework the OS Size Information support to correct module size calculations and to report size of assembler modules in the OS library.

### **Removed Features**

No features have been removed from this release.

## 3.3 Version 2.0.22

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### **Additional Features**

The following features have been added to this release:

- Interim preview Release.

### **Modified Features**

The following features have been modified in this release:

- The code in `Os_longjmp` updated to protect against ISRs when the `longjmp` buffer is on the stack (only affects ECC tasks when 'Enable stack repositioning' is selected).
- Updated to add fix for EHI issue 444763.

### **Removed Features**

No features have been removed from this release.

## 8 Change History



### 3.4 Version 2.0.21

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#### **Additional Features**

The following features have been added to this release:

- Fourth full release.

#### **Modified Features**

The following features have been modified in this release:

- Updated to run with RTA-OS tools release (v5.3.0) and tests.
- Compatible with both MULTI v5.1.7D-P20 and v5.1.7D-P30 compilation tools.
- Updated to add fix for EHI issue 341079.
- Updated to add fix for EHI issue 378793.

#### **Removed Features**

No features have been removed from this release.

### 3.5 Version 2.0.20

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#### **Additional Features**

The following features have been added to this release:

- Third full release.
- Adds GenericV850E2\_8IPL variant to support parts with 8 IPL levels for maskable EI ISRs and reduced system protection functions (i.e. V850E2S CPU).
- Interrupt configuration macros added (i.e. `Os_Enable_x()`, `Os_Disable_x()` and `Os_Clear_x()`).
- Tracking of Category 1 ISRs with ORTI debugging.
- Adds Target option 'ORTI Stack Fill' to support debugger stack use monitoring.

#### **Modified Features**

No features have been modified in this release.

### **Removed Features**

No features have been removed from this release.

## 3.6 Version 2.0.10

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### **Additional Features**

The following features have been added to this release:

- Second full release.
- Full support for V850E2S/Fx4-L devices.

### **Modified Features**

The following features have been modified in this release:

- Uses the `registermode=32` compiler option rather than `registermode=26` used in previous releases.
- Tested on the V850E2S/FG4-L (DF3580).
- Now supports the stack of an untrusted object (i.e. task, function, ISR) being either aligned to a MPU memory protection region boundary or not.
- Corrects the interrupt vector table entry at address 0x30 for 16 byte interrupt vectors.

### **Removed Features**

No features have been removed from this release.

## 3.7 Version 2.0.0

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### **Additional Features**

The following features have been added to this release:

- First full release.
- SC2 timing protection.
- Memory and time protection support PPU and TSU hardware.
- Support for aligning stack to MPU regions in tasks and ISRs.
- Stack corruption testing in ISRs.

### **Modified Features**

No features have been modified in this release.

### **Removed Features**

No features have been removed from this release.

## 3.8 Version 1.99.4

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### **Additional Features**

The following features have been added to this release:

- Fifth Early Access Release.
- Also supports Fx4-L devices.
- Added SC3 memory protection.

### **Modified Features**

No features have been modified in this release.

### **Removed Features**

No features have been removed from this release.

## 3.9 Version 1.99.3

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### **Additional Features**

The following features have been added to this release:

- Fourth Early Access Release.
- Also supports the single EI interrupt vector mode using 4 byte interrupt vectors.
- Supports relocatable vector tables.

### **Modified Features**

The following features have been modified in this release:

- Updated RTA-OS library compilation options.
- Updated 16 byte interrupt vector table entries.

### **Removed Features**

No features have been removed from this release.

### 3.10 Version 1.99.2

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#### **Additional Features**

The following features have been added to this release:

- Third Early Access Release.

#### **Modified Features**

The following features have been modified in this release:

- Uses the -v850e2v3 cpu option (no other change).

#### **Removed Features**

No features have been removed from this release.

### 3.11 Version 1.99.1

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#### **Additional Features**

The following features have been added to this release:

- Second Early Access Release.

#### **Modified Features**

The following features have been modified in this release:

- Adds V850E2/Fx4 variants and ORTI debugger support.

#### **Removed Features**

No features have been removed from this release.

### 3.12 Version 1.99.0

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#### **Additional Features**

The following features have been added to this release:

- Initial Early Access. Category 1 and 2 interrupts. BCC Tasks. SC1 Autosar conformance.

#### **Modified Features**

No features have been modified in this release.

#### **Removed Features**

No features have been removed from this release.

## 12 Change History

## 4 Fixed EHI Calls

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

### 4.1 Version 2.0.24

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#### **EHI 485847**

*Status:* Fixed

*Title:* GetAbortStack() code in Os\_vec\_init.c when DistrustStack is undefined

*Description:* When the DistrustStack target option is undefined an incorrect call to Os\_Cbk\_GetAbortStack() occurs in the RTA-OS library file Os\_vec\_init.c causing a link error. Defining the target option to either true or false prevents this. The library code has been updated to fix this issue so that the call to Os\_Cbk\_GetAbortStack() does not occur by default.

#### **EHI 495722**

*Status:* Fixed

*Title:* Default RTA-OS Os\_Cbk\_GetAbortStack() code may return NULL

*Description:* In configurations that use the Os\_Cbk\_SetMemoryAccess callback to update the memory protection settings for untrusted code, but where the stack value is not actually passed to the callback (i.e. Stack Monitoring is disabled AND target option 'Enable stack repositioning' is false) a NULL value can be returned instead of a valid address to set the stack pointer in the abort hook. This release has updated the default implementation of Os\_Cbk\_GetAbortStack() to fix this issue.

#### **EHI 538711**

*Status:* Fixed

*Title:* Mismatch between port and tools causing missing line of OS code

*Description:* The v2.0.23 release was developed and tested with the RTA-OS tools v5.4.3. RTA-OS tool versions v5.5.0 and above are incompatible with the v2.0.23. Using these tool versions results in a build error in the RTA-OS libraries. This release has been updated to resolve this issue.

**EHI 550148**

*Status:* Fixed

*Title:* Incorrect calls to `Os_Cbk_Terminated_ISRName`

*Description:* In applications that support the forced termination of ISRs the termination call-back is incorrectly called when an untrusted ISR terminates normally. This occurs when the RTA-OS library is built with tools later than v5.4.3. The call-back is not called incorrectly when stack repositioning is enabled or when both timing protection is disabled and `TerminateApplication` is omitted. This release has been updated to prevent the incorrect calls.

#### 4.2 Version 2.0.22

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**EHI 444763**

*Status:* Fixed

*Title:* Nested Category 2 interrupt handling can mistakenly execute a task ahead of an ISR in some applications.

*Description:* Nested Category 2 interrupts now always run in preference to tasks in all cases.

#### 4.3 Version 2.0.21

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**EHI 341079**

*Status:* Fixed

*Title:* Error in I/O pin definitions in HelloWorld example application

*Description:* The I/O pin definitions were incorrect for untested variants (i.e. not the DF3506 and DF3580).

**EHI 378793**

*Status:* Fixed

*Title:* Default interrupt must not overwrite protection exception vectors

*Description:* The default interrupt incorrectly populated the `SYSERR` exception vector. Now modified to always go to `Os_abort()`.

## 5 **Limitations**

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### 5.1 **Installer**

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There are the following limitations for the installer:

<b>Limitation</b>	None.
<b>Workaround</b>	None.

### 5.2 **V850E2GHS DLL**

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There are no known limitations.

## 6 Contacting ETAS

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### 6.1 Technical Support

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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

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#### 6.2.1 ETAS Global Headquarters

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**ETAS GmbH**

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70469 Stuttgart  
Germany

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#### 6.2.2 ETAS Local Sales & Support Offices

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Contact details for your local sales office and local technical support team (where available) can be found on the ETAS web site:

ETAS subsidiaries [www.etas.com/en/contact.php](http://www.etas.com/en/contact.php)  
ETAS technical support [www.etas.com/en/hotlines.php](http://www.etas.com/en/hotlines.php)