

# Smart Configurator for RH850 Plug-in in e<sup>2</sup> studio 2024-07

## Smart Configurator for RH850 V1.12.0

### Release Note

#### Introduction

Thank you for using the Smart Configurator for RH850.

This document describes the restrictions and points for caution. Read this document before using the product.

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## 1. Introduction

Smart Configurator is a utility for combining software to meet your needs. It supports the following three functions related to the embedding of Renesas drivers in your systems: importing middleware, generating driver code, and setting pins.

### 1.1 System Requirements

The operating environment is as follows.

#### 1.1.1 Window PC

- System: x64/x86 based processor
  - Windows® 11
  - Windows® 10 (64-bit version)
  - Windows® 8.1 (64-bit version)
- Memory capacity: We recommend 4 GB or more
- Capacity of hard disk: At least 500 MB of free space.
- Display: Graphics resolution should be at least 1024 x 768, and the mode should display at least 65,536 colors.
- Processor: 1 GHz or higher (must support hyper-threading, multi-core CPUs)

#### 1.1.2 Linux PC

Smart Configurator for RH850 plug-in in e<sup>2</sup> studio 2024-04 or later is supported on Linux OS.

- System: x64 based processor, 2 GHz or faster (with multicore CPUs)
  - Ubuntu 22.04 LTS Desktop (64-bit version)
  - Ubuntu 20.04 LTS Desktop (64-bit version)
- Memory capacity: We recommend 2 GB or more.
- Capacity of hard disk: At least 2 GB of free space.

#### 1.1.3 Development Environments

- Renesas electronics Compiler for RH850 [CC-RH] V2.06.00 or later
- GHS Multi V8.1.4 or later
- IAR Embedded Workbench for RH850 V3.10.1 <sup>Note</sup> or later
- CS+ for CC V8.12.00 or later (Windows PC)

- **Note:**

1. IAR Embedded Workbench for RH850 V3.10.1 doesn't support RH850/U2B yet, so Smart Configurator doesn't support creating RH850/U2B IAR project and generate code.

## 2. Support List

### 2.1 Support Devices List

Below is a list of devices supported by the Smart Configurator for RH850 V1.12.0.

**Table 2-1 Support Devices**

| Group<br>(HW Manual<br>number)              | PIN    | Device name<br>(Device file version)                      |
|---------------------------------------------|--------|-----------------------------------------------------------|
| RH850/F1KM-S1<br>Group<br>(R01UH0684EJ0130) | 48pin  | R7F701693, R7F701694, R7F701695 (V1.40)                   |
|                                             | 64pin  | R7F701690, R7F701691, R7F701692 (V1.40)                   |
|                                             | 80pin  | R7F701687, R7F701688, R7F701689 (V1.40)                   |
|                                             | 100pin | R7F701684, R7F701685, R7F701686 (V1.40)                   |
| RH850/F1KM-S2<br>Group<br>(R01UH0684EJ0130) | 100pin | R7F701760 (V1.40)                                         |
|                                             | 144pin | R7F701762 (V1.40)                                         |
|                                             | 176pin | R7F701764 (V1.40)                                         |
| RH850/F1KM-S4<br>Group<br>(R01UH0684EJ0130) | 100pin | R7F701760, R7F701644, R7F701645 (V1.40)                   |
|                                             | 144pin | R7F701762, R7F701646, R7F701647 (V1.40)                   |
|                                             | 176pin | R7F701764, R7F701648, R7F701649 (V1.40)                   |
|                                             | 232pin | R7F701650, R7F701651 (V1.40)                              |
|                                             | 272pin | R7F701652, R7F701653 (V1.40)                              |
| RH850/U2A16 Group<br>(R01UH0864EJ0130)      | 292pin | R7F702300 (V1.50), R7F702300A (V1.40), R7F702300B (V1.30) |
|                                             | 373pin | R7F702300 (V1.50), R7F702300A (V1.40), R7F702300B (V1.30) |
|                                             | 516pin | R7F702300 (V1.50), R7F702300A (V1.40), R7F702300B (V1.30) |
| RH850/U2A8 Group<br>(R01UH0864EJ0130)       | 292pin | R7F702301 (V1.30), R7F702301A (V1.40), R7F702301B (V1.30) |
|                                             | 373pin | R7F702301 (V1.30), R7F702301A (V1.40), R7F702301B (V1.30) |
| RH850/U2A6 Group<br>(R01UH0864EJ0130)       | 144pin | R7F702302 (V1.40)                                         |
|                                             | 156pin | R7F702302 (V1.40)                                         |
|                                             | 176pin | R7F702302 (V1.40)                                         |
|                                             | 292pin | R7F702302 (V1.40)                                         |
| RH850/F1KH-D8<br>Group<br>(R01UH0684EJ0111) | 176pin | R7F701708, R7F701709 (V1.20)                              |
|                                             | 233pin | R7F701710, R7F701711 (V1.20)                              |
|                                             | 324pin | R7F701714, R7F701715 (V1.20)                              |
| RH850/C1M-A2 Group<br>(R01UH0607EJ0120)     | 252pin | R7F701275 (V1.10)                                         |
| RH850/U2B6 Group<br>(R01UH0923EJ0050)       | 292pin | R7F70255x (V1.10)                                         |
| RH850/U2B10 Group<br>(R01UH0923EJ0050)      | 292pin | R7F70254x (V1.00)                                         |
|                                             | 373pin | R7F70254x (V1.00)                                         |
|                                             | 468pin | R7F70254x (V1.00)                                         |
| RH850/U2C8 Group<br>(R01UH1018EJ0040)       | 292pin | R7F702600 (E0.81c)                                        |

## 2.2 Support Components List

Below is a list of Components supported by the Smart Configurator for RH850 V1.12.0.

**Table 2-2 Support Components**

✓: Support, -: Non-support

| No | Components                        | Mode                    | RH850/<br>F1KM | RH850/<br>U2A | RH850/<br>F1KH | RH850/<br>C1M | RH850/<br>U2B | RH850/<br>U2C | Remarks |
|----|-----------------------------------|-------------------------|----------------|---------------|----------------|---------------|---------------|---------------|---------|
| 1  | A/D Converter                     | -                       | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
| 2  | CSI Master                        | Master Transmit         | ✓              | -             | ✓              | ✓             | -             | -             |         |
|    |                                   | Master Receive          | ✓              | -             | ✓              | ✓             | -             | -             |         |
|    |                                   | Master Transmit/Receive | ✓              | -             | ✓              | ✓             | -             | -             |         |
| 3  | CSI Slave                         | Slave Transmit          | ✓              | -             | ✓              | ✓             | -             | -             |         |
|    |                                   | Slave Receive           | ✓              | -             | ✓              | ✓             | -             | -             |         |
|    |                                   | Slave Transmit/Receive  | ✓              | -             | ✓              | ✓             | -             | -             |         |
| 4  | Data CRC                          | -                       | ✓              | ✓             | ✓              | ✓             | -             | ✓             |         |
| 5  | DMA Controller                    | -                       | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
| 6  | DTS Controller                    | -                       | -              | ✓             | -              | ✓             | -             | ✓             |         |
| 7  | Error Control Module              | -                       | -              | ✓             | -              | ✓             | -             | ✓             |         |
| 8  | ATOM Signal Output Mode Compare   | -                       | -              | ✓             | -              | -             | -             | -             |         |
| 9  | ATOM Signal Output Mode Immediate | -                       | -              | ✓             | -              | -             | -             | -             |         |
| 10 | ATOM Signal Output Mode PWM       | -                       | -              | ✓             | -              | -             | -             | -             |         |
| 11 | ATOM Signal Output Mode Serial    | -                       | -              | ✓             | -              | -             | -             | -             |         |
| 12 | Dead Time Module                  | -                       | -              | ✓             | -              | -             | -             | -             |         |
| 13 | GTM Clock                         | -                       | -              | ✓             | -              | -             | -             | -             |         |
| 14 | TIM Bit Compression Mode          | -                       | -              | ✓             | -              | -             | -             | -             |         |

Table 2-3 Support Components

✓ : Support, - : Non-support

| No | Components                       | Mode             | RH850/<br>F1KM | RH850/<br>U2A | RH850/<br>F1KH | RH850/<br>C1M | RH850/<br>U2B | RH850/<br>U2C | Remarks                     |
|----|----------------------------------|------------------|----------------|---------------|----------------|---------------|---------------|---------------|-----------------------------|
| 15 | TIM Gated Periodic Sampling Mode | -                | -              | ✓             | -              | -             | -             | -             |                             |
| 16 | TIM Input Event Mode             | -                | -              | ✓             | -              | -             | -             | -             |                             |
| 17 | TIM Input Prescaler Mode         | -                | -              | ✓             | -              | -             | -             | -             |                             |
| 18 | TIM Pulse Integration Mode       | -                | -              | ✓             | -              | -             | -             | -             |                             |
| 19 | TIM PWM Measurement Mode         | -                | -              | ✓             | -              | -             | -             | -             |                             |
| 20 | TIM Serial Shift Mode            | -                | -              | ✓             | -              | -             | -             | -             |                             |
| 21 | Time Base Unit                   | -                | -              | ✓             | -              | -             | -             | -             |                             |
| 22 | Interrupt Controller             | -                | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             | Only table reference method |
| 23 | Key Return                       | -                | ✓              | -             | ✓              | -             | -             | -             |                             |
| 24 | MSPI Master                      | Transmit         | -              | ✓             | -              | -             | ✓             | ✓             | No support LVDS mode        |
|    |                                  | Receive          | -              | ✓             | -              | -             | ✓             | ✓             |                             |
|    |                                  | Transmit/Receive | -              | ✓             | -              | -             | ✓             | ✓             |                             |
| 25 | MSPI Slave                       | Transmit         | -              | ✓             | -              | -             | ✓             | ✓             |                             |
|    |                                  | Receive          | -              | ✓             | -              | -             | ✓             | ✓             |                             |
|    |                                  | Transmit/Receive | -              | ✓             | -              | -             | ✓             | ✓             |                             |
| 26 | OS Timer                         | -                | ✓              | ✓             | ✓              | ✓             | -             | ✓             |                             |
| 27 | Ports                            | -                | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |                             |
| 28 | Real-Time Clock                  | -                | ✓              | ✓             | ✓              | -             | -             | ✓             |                             |
| 29 | RIIC Master                      | -                | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |                             |
| 30 | RIIC Slave                       | -                | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |                             |

Table 2-4 Support Component

✓ : Support, - : Non-support

| No | Components                       | Mode                                     | RH850/F<br>1KM | RH850/<br>U2A | RH850/F-1K<br>H | RH850/C<br>1M | RH850/<br>U2B | RH850/<br>U2C | Remarks                     |
|----|----------------------------------|------------------------------------------|----------------|---------------|-----------------|---------------|---------------|---------------|-----------------------------|
| 31 | SCI3 Asynchronous Mode           | Transmission                             | -              | ✓             | -               | ✓             | -             | -             |                             |
|    |                                  | Reception                                | -              | ✓             | -               | ✓             | -             | -             |                             |
|    |                                  | Transmission / Reception                 | -              | ✓             | -               | ✓             | -             | -             |                             |
|    |                                  | Multi-processor Transmission             | -              | ✓             | -               | ✓             | -             | -             |                             |
|    |                                  | Multi-processor Reception                | -              | ✓             | -               | ✓             | -             | -             |                             |
|    |                                  | Multi-processor Transmission / Reception | -              | ✓             | -               | ✓             | -             | -             |                             |
| 32 | SCI3 Clock Synchronous Mode      | Transmission                             | -              | ✓             | -               | ✓             | -             | -             |                             |
|    |                                  | Reception                                | -              | ✓             | -               | ✓             | -             | -             |                             |
|    |                                  | Transmission / Reception                 | -              | ✓             | -               | ✓             | -             | -             |                             |
| 33 | Stand-by Controller              | -                                        | ✓              | ✓             | ✓               | -             | -             | -             | Only Stop and DeepStop mode |
| 34 | Clock Divider                    | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 35 | Delay Count                      | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 36 | External Event Count             | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 37 | Input Interval Timer             | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 38 | Input Period Count Detection     | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 39 | Input Position Detection         | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 40 | Input Pulse Interval Judgment    | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 41 | Input Pulse Interval Measurement | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 42 | Input Signal Width Judgement     | -                                        | ✓              | ✓             | ✓               | ✓             | -             | ✓             |                             |
| 43 | Input Signal Width Measurement   | -                                        | ✓              | ✓             | ✓               | ✓             | -             | ✓             |                             |
| 44 | Interval Timer                   | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |
| 45 | One-Pulse Output                 | -                                        | ✓              | ✓             | ✓               | ✓             | ✓             | ✓             |                             |

Table 2-5 Support Components

✓ : Support, - : Non-support

| No | Components                                               | Mode                     | RH850/<br>F1KM | RH850/<br>U2A | RH850/<br>F1KH | RH850/<br>C1M | RH850/<br>U2B | RH850/<br>U2C | Remarks |
|----|----------------------------------------------------------|--------------------------|----------------|---------------|----------------|---------------|---------------|---------------|---------|
| 46 | One-Shot Pulse output                                    | -                        | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
| 47 | Overflow Interrupt Output (Input Period Count Detection) | -                        | ✓              | ✓             | ✓              | -             | -             | ✓             |         |
| 48 | Overflow Interrupt Output (Width Measurement)            | -                        | ✓              | ✓             | ✓              | -             | ✓             | ✓             |         |
| 49 | PWM Output                                               | -                        | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
| 50 | Triangle PWM Output                                      | -                        | ✓              | ✓             | ✓              | ✓             | -             | ✓             |         |
| 51 | Triangle PWM Output with Dead Time                       | -                        | -              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
| 52 | UART Interface                                           | Transmission             | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
|    |                                                          | Reception                | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
|    |                                                          | Transmission / Reception | ✓              | ✓             | ✓              | ✓             | ✓             | ✓             |         |
| 53 | Window Watchdog Timer                                    | -                        | ✓              | ✓             | ✓              | ✓             | -             | ✓             |         |
| 54 | ADC Boundary Flag Generator                              | -                        | -              | -             | -              | -             | ✓             | -             |         |



## 2.3 New Support

### 2.3.1 Support new packages RH850/U2C8

From Smart Configurator for RH850 V1.12.0, RH850/U2C8 device is supported.  
See “Table 2-1 Support Devices” for details on supported device information.

### 2.3.2 Support to access FAQ from [Overview] page

From Smart Configurator for RH850 V1.12.0, FAQ can be accessed from [Overview] page.

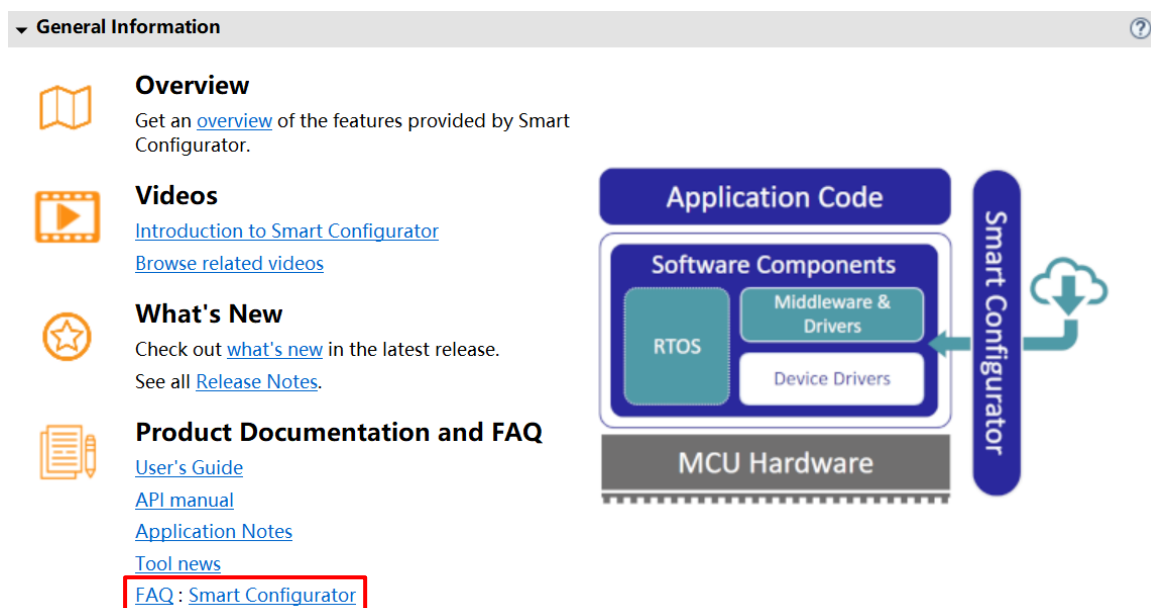


Figure 2-1 [Overview] page in e<sup>2</sup> studio

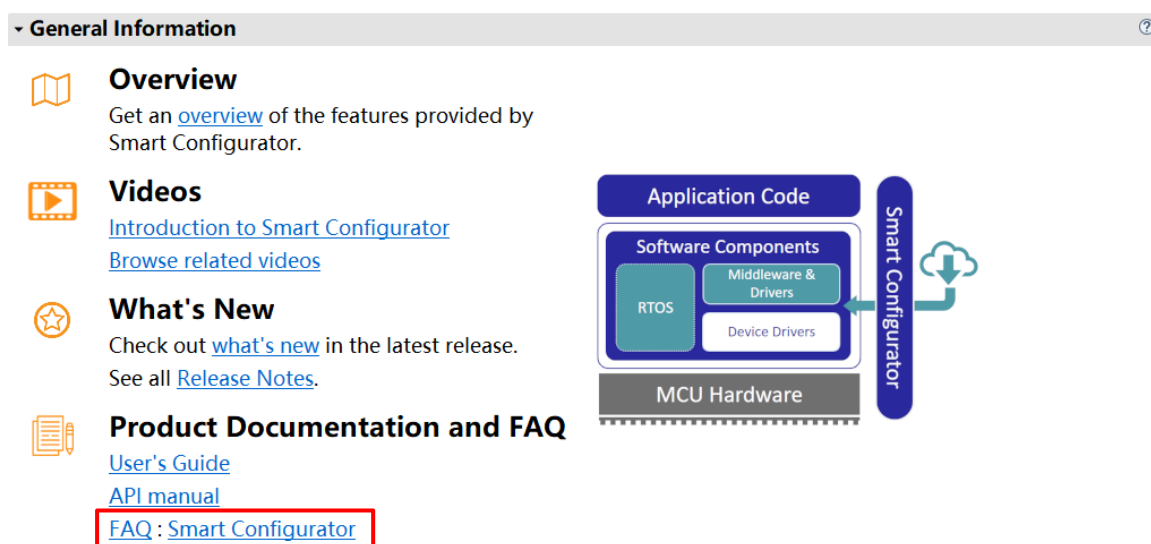


Figure 2-2 [Overview] page in standalone Smart Configurator for CCRH/IAR/GHS toolchain

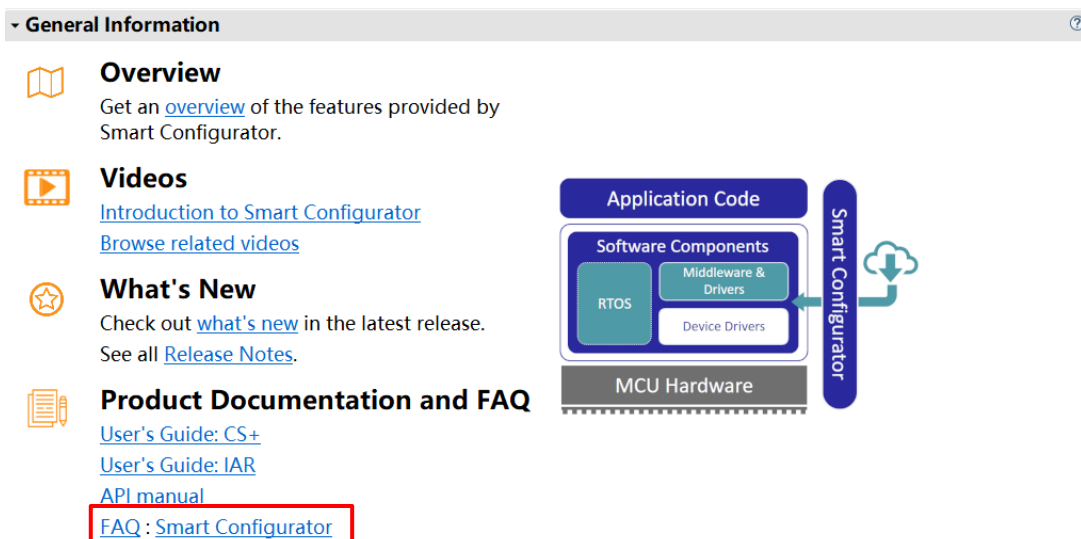


Figure 2-3 [Overview] page in standalone Smart Configurator for All Toolchain (CC-RH, GHS, IAR) toolchain

### 2.3.3 Simplify MCU/MPU Package view

From Smart Configurator for RH850 V1.12.0., when using QFP device, MCU/MPU Package view is simplified to remove the outer pad by default for easy recognition of user changes. If the user wants to check the pin input/output information, please select "I/O direction" or "I/O direction in outer pad".

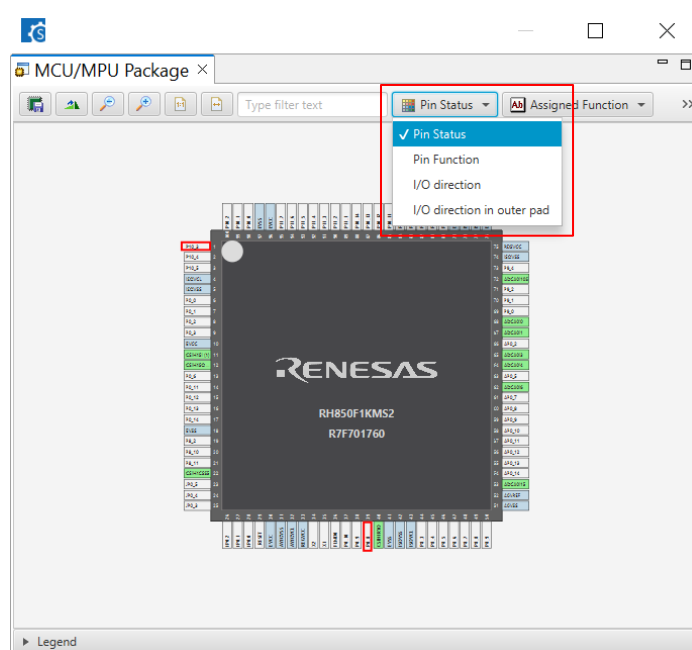


Figure 2-4 MCU/MPU Package view without outer pad setting

### 3. Changes

This chapter describes changes to the Smart Configurator for RH850 V1.12.0.

#### 3.1 Correction of Issues/Limitations

**Table 3-1 List of Correction of Issues/Limitations**

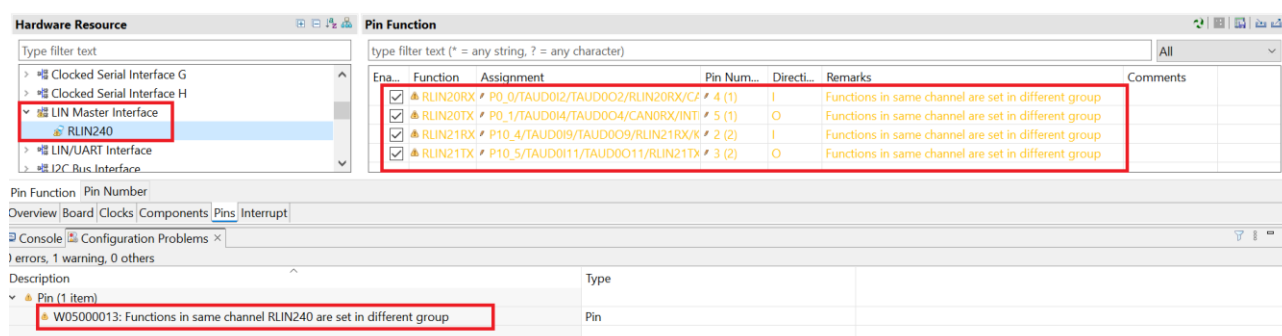
✓: Applicable, -: Not Applicable

| No | Description                                                                        | RH850<br>F1KM | RH850<br>U2A | RH850<br>F1KH | RH850<br>C1M | RH850<br>U2B | RH850<br>U2C | Remarks |
|----|------------------------------------------------------------------------------------|---------------|--------------|---------------|--------------|--------------|--------------|---------|
| 1  | Fixed the issue of an incorrect group pin setting warning of RLIN Master Interface | ✓             | -            | ✓             | -            | -            | -            |         |
| 2  | Fixed the build error issue caused by device file updating                         | -             | ✓            | -             | -            | -            | -            |         |

##### 3.1.1 Fixed the issue of an incorrect group pin setting warning of RLIN Master Interface

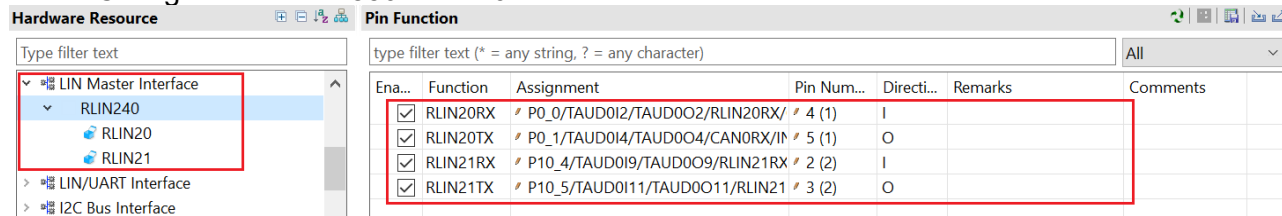
The incorrect warning “W05000013: Functions in same channel RLIN24 $n$  are set in different group” is thrown when assigning more than 1 channel pins for RLIN Master interface in [Pins] view. From Smart Configurator for RH850 V1.12.0, the warning is eliminated.

Smart Configurator for RH850 V1.11.0 and before:



**Figure 3-1 RLIN Master Interface pin group with warning**

Smart Configurator for RH850 V1.12.0:



**Figure 3-2 RLIN Master Interface pin group without warning**

### **3.1.2 Fixed the build error issue caused by device file updating**

When creating configuration for RH850/U2A components in Smart Configurator for RH850V1.11.0 version, build error will occur when building the generated code.

This issue has been fixed in Smart Configurator for RH850 V1.12.0.

## **3.2 Specification Changes**

None.

#### 4. List of RENESAS TOOL NEWS AND TECHNICAL UPDATE

Below is a list of notifications delivered by RENESAS TOOL NEWS and TECHNICAL UPDATE.

| Issue date    | Document No. | Description                                                                                                                                                                                                                                                                                                                                     | Applicable MCUs | Fixed version |
|---------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|
| Mar.16, 2019  | R20TS0407    | 1. Build error occurs when setting not to generate clocks<br>2. RAM size display error<br><a href="https://www.renesas.com/document/tnn/notes-rh850-smart-configurator">https://www.renesas.com/document/tnn/notes-rh850-smart-configurator</a>                                                                                                 | RH850F1KM       | V1.2.0        |
| Jun. 01, 2016 | R20TS0431    | When using PLL0 Clock<br><a href="https://www.renesas.com/document/tnn/notes-rh850-smart-configurator-0">https://www.renesas.com/document/tnn/notes-rh850-smart-configurator-0</a>                                                                                                                                                              | RH850F1KM       | V1.2.0        |
| Jul.01, 2019  | R20TS0441    | 1. When using PWM output and triangle PWM output slave setting<br>2. Port input buffer setting error<br>3. Port drive strength control setting error<br>4. Port register setting error<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850</a> | RH850F1KM       | V1.2.0        |
| Aug.01, 2019  | R20TS0463    | 1. When using the input pulse interval measurement function<br>2. When using the Clocked Serial Interface in Master mode<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-0">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-0</a>                                                           | RH850F1KM       | V1.2.0        |
| Oct.16, 2019  | R20TS0500    | 1. When using data CRC<br>2. When using one-pulse outputs<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-1">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-1</a>                                                                                                                          | RH850F1KM       | V1.2.0        |
| Apr.16, 2020  | R20TS0569    | When using CSI master and CSI slave<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-2">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-2</a>                                                                                                                                                | RH850F1KM       | V1.3.0        |
| May.16, 2020  | R20TS0576    | When using CSI master and CSI slave<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-3">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-3</a>                                                                                                                                                | RH850F1KM       | V1.3.0        |
| Feb. 16, 2021 | R20TS0668    | When using CSI master<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-4">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-4</a>                                                                                                                                                              | RH850F1KM       | V1.4.0        |

| Issue date    | Document No. | Description                                                                                                                                                                                                                                                                                                                                                                                   | Applicable MCUs        | Fixed version |
|---------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|
| Apr. 05, 2021 | R20TS0679    | 1. When using CSI Master and CSI Slave with CSIG<br>2. When using CSI Master with CSIH<br>3. When using Data CRC<br>4. When using One-Pulse Output and One-Shot Pulse Output<br>5. When using PWM Output and Triangle PWM Output<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-5">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-5</a> | RH850F1KM<br>RH850U2A  | V1.4.0        |
| Jun.16, 2021  | R20TS0717    | 1. When using A/D converter with ADCJ2<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-6">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-6</a>                                                                                                                                                                                           | RH850U2A               | V1.5.0        |
| Jul. 01, 2021 | R20TS0723    | 1. Notes on using One-Shot Pulse Output, PWM Output, Triangle PWM Output, Triangle PWM Output with Dead Time functions with TAUD1, TAUD2<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-7">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-7</a>                                                                                         | RH850U2A               | V1.5.0        |
| Sep. 16, 2021 | R20TS0744    | 1. Notes on selecting PLL0 clock CPLL0OUT as source of CPU Subsystem clock<br>2. Notes on using CSIH Master receive and Master transmit/receive operation mode<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-8">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-8</a>                                                                   | RH850F1KM<br>RH850F1KH | V1.5.0        |
| Feb. 01, 2022 | R20TS0806    | 1. Notes on using T&H path self-diagnosis function of A/D Converter<br><br>2. Notes on redundant macros and wrong comments in A/D Converter header file<br><a href="https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-9">https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-9</a>                                                                          | RH850U2A               | V1.6.0        |

## 5. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RH850 V1.12.0.

### 5.1 List of Limitation

**Table 5-1 List of Limitation**

✓ : Applicable, -: Not Applicable

| No | Description                                         | RH850F<br>1KM | RH850U2<br>A | RH850F<br>1KH | RH850C<br>1M | RH850U<br>2B | RH850U<br>2C | Remarks |
|----|-----------------------------------------------------|---------------|--------------|---------------|--------------|--------------|--------------|---------|
| 1  | Note on using RIIC                                  | ✓             | ✓            | ✓             | ✓            | ✓            | ✓            |         |
| 2  | Note on using OS Timer                              | ✓             | -            | ✓             | -            | -            | -            |         |
| 3  | Note on using All Toolchain (CC-RH, GHS, IAR)       | -             | -            | -             | -            | ✓            | -            |         |
| 4  | Note on using RH850/U2C devices                     | -             | -            | -             | -            | -            | ✓            |         |
| 5  | Note on using Smart Configurator for RH850 on Linux | ✓             | ✓            | ✓             | ✓            | ✓            | ✓            |         |

## 5.2 Details of Limitation

### 5.2.1 Note on using RIIC

When using RIIC master or RIIC Slave to send or receive data, error interrupt priority must be higher than any other interrupt priority.

Interrupt setting

|                                                                                                                                                                                                            |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Transmit data empty interrupt (TI)                                                                                                                                                                         | Lowest  |
| Transmit end interrupt (TEI)                                                                                                                                                                               | Lowest  |
| Receive data full interrupt (RI)                                                                                                                                                                           | Lowest  |
| <input type="checkbox"/> Enable timeout interrupt (TMOI)<br><input type="checkbox"/> Enable arbitration-lost interrupt (ALI)<br><input checked="" type="checkbox"/> Enable NACK reception interrupt (NAKI) |         |
| Priority                                                                                                                                                                                                   | Level 8 |

**Figure 5-1. RIIC interrupt priority setting**

### 5.2.2 Note on using OS Timer

Smart Configurator only supports OSTM0, OSTM1~OSTM4 are not supported.

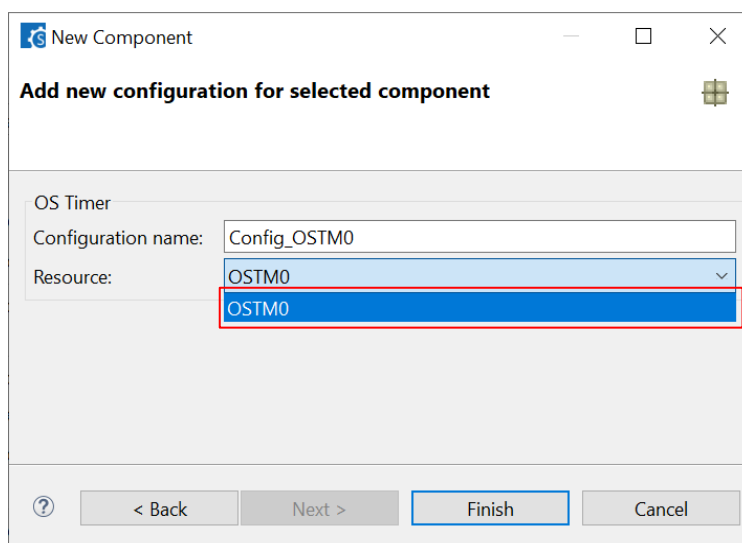


Figure 5-2 OS Timer Resource selection

### 5.2.3 Note on using All Toolchain (CC-RH, GHS, IAR)

When selecting RH850/U2B devices and All Toolchain (CC-RH, GHS, IAR) to create project, the generated code does not support IAR compiler, the reason is:

IAR Embedded Workbench for RH850 V3.10.1 doesn't support RH850/U2B yet, so Smart Configurator doesn't generate code adapted to IAR compiler.

All toolchain (CC-RH, GHS, IAR) will be changed to All Toolchain (CC-RH, GHS) in future.

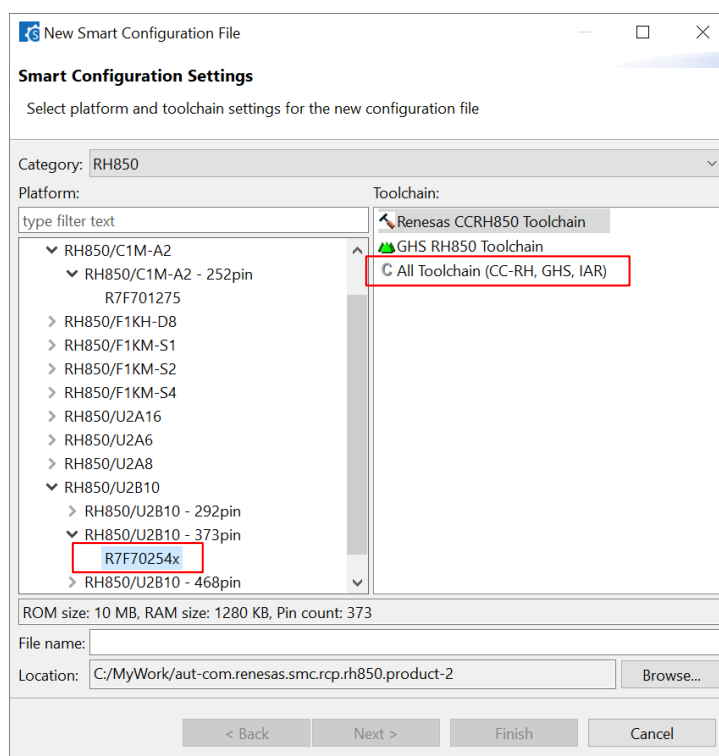


Figure 5-3 All Toolchain (CC-RH, GHS, IAR) selection

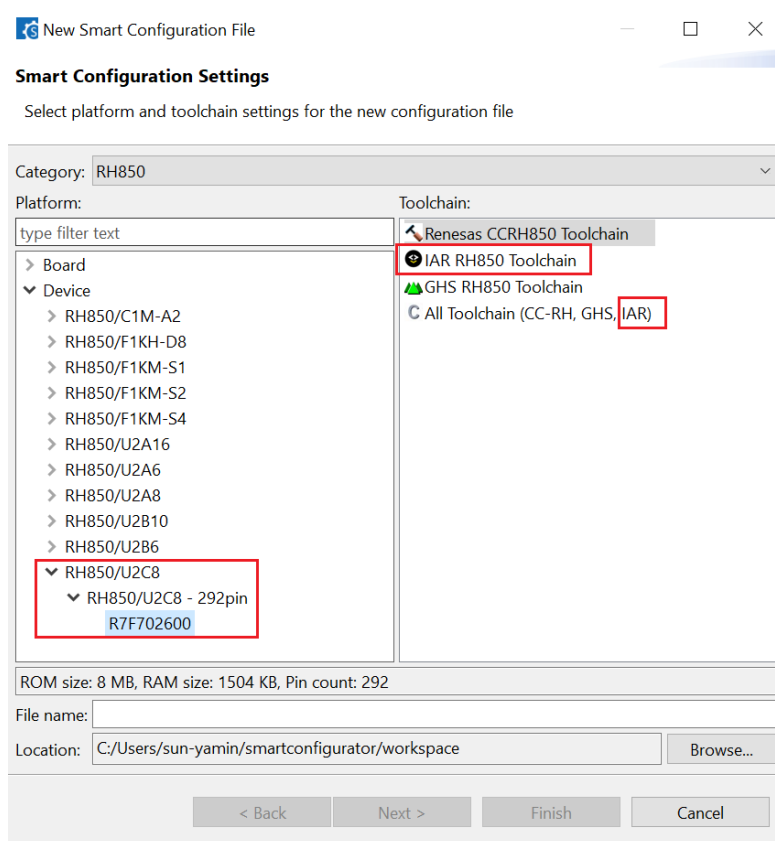


#### 5.2.4 Note on selecting RH850/U2C devices

When selecting RH850/U2C devices in Smart Configurator for RH850 V1.12.0, IAR compiler is supported by using IAR RH850 Toolchain and All Toolchain (CC-RH, GHS, IAR) to create project.

But IAR Embedded Workbench for RH850 V3.10.1 doesn't support RH850/U2C.

From next version, IAR compiler support will be removed when selecting RH850/U2C devices.

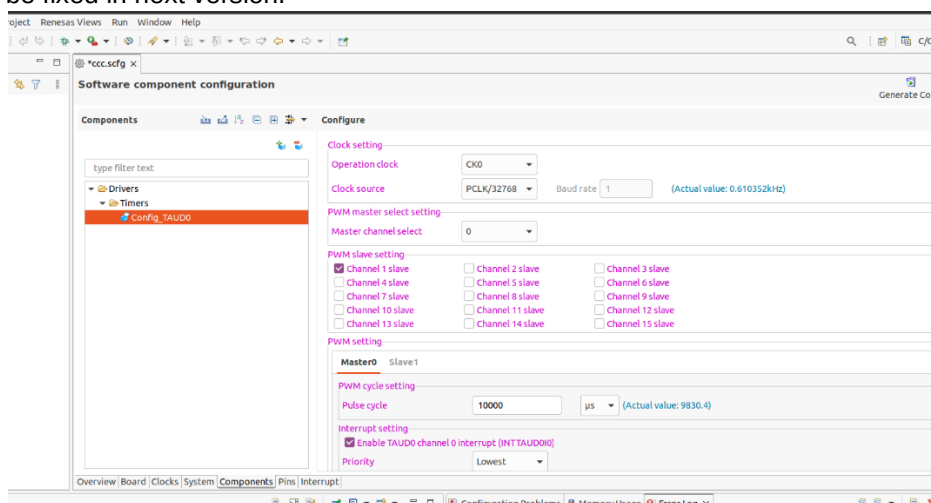


### Figure 5-4 IAR toolchain selection

### 5.2.5 Note on using Smart Configurator for RH850 on Linux

When using Smart Configurator for RH850 on Linux, the font of UI of some components is purple, some is red.

This issue will be fixed in next version.



**Figure 5-5 Font in UI on Linux is purple**

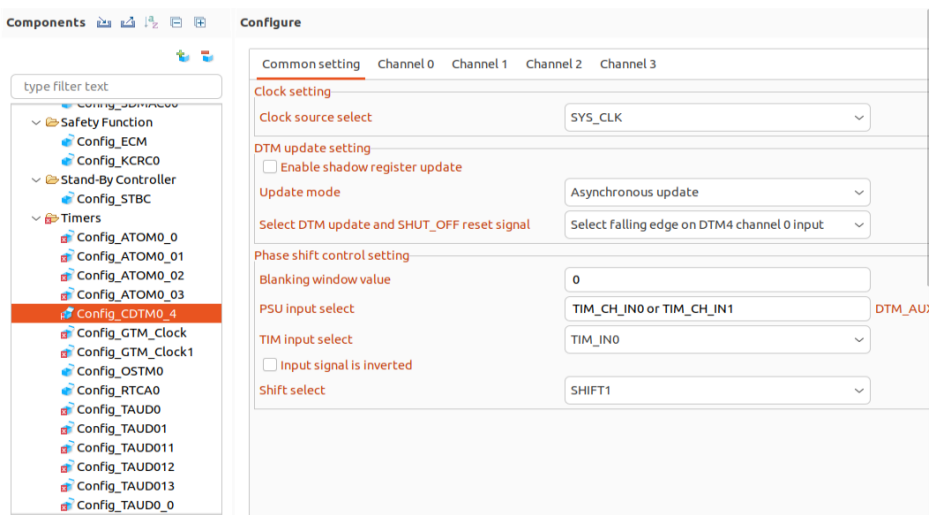


Figure 5-6 Font in UI on Linux is red

## 6. Points for Caution

This section describes points for caution regarding the Smart Configurator for RH850 V1.12.0

### 6.1 List of Caution

Table 6-1 List of Caution

✓ : Applicable, - : Not Applicable

| No | Description                                                                 | RH850F<br>1KM | RH850U<br>2A | RH850F<br>1KH | RH850C<br>1M | RH850U<br>2B | RH850U<br>2C | Remarks |
|----|-----------------------------------------------------------------------------|---------------|--------------|---------------|--------------|--------------|--------------|---------|
| 1  | About the I/O define header file                                            | ✓             | ✓            | ✓             | ✓            | ✓            | ✓            |         |
| 2  | About loading the project on CS+                                            | ✓             | ✓            | ✓             | ✓            | ✓            | ✓            |         |
| 3  | About the sample projects                                                   | ✓             | ✓            | ✓             | ✓            | ✓            | -            |         |
| 4  | About the decimal point                                                     | ✓             | ✓            | ✓             | ✓            | ✓            | ✓            |         |
| 5  | Note on pins sharing functions.                                             | ✓             | ✓            | ✓             | ✓            | ✓            | ✓            |         |
| 6  | Note on Interrupt Controller resource name                                  | ✓             | -            | -             | -            | -            | -            |         |
| 7  | Note on DMA/DTS trigger generator setting of MSPI Master                    | -             | ✓            | -             | -            | ✓            | ✓            |         |
| 8  | Note on CPU Operating mode of DTS Controller                                | -             | ✓            | -             | -            | -            | -            |         |
| 9  | Note on using Smart Configurator when the OS language is Japanese           | -             | ✓            | -             | -            | ✓            | ✓            |         |
| 10 | Note on changing device when using Error Control Module                     | -             | ✓            | -             | ✓            | -            | -            |         |
| 11 | Note on reloading project for Error Control Module                          | -             | ✓            | -             | -            | -            | -            |         |
| 12 | Note on the “Release Notes” or “Tool News” display issue in Renesas Website | ✓             | ✓            | ✓             | ✓            | ✓            | -            |         |
| 13 | Note on using Smart Configurator for RH850 project in CS+                   | ✓             | ✓            | ✓             | ✓            | ✓            | ✓            |         |
| 14 | Note on using RH850/U2A devices                                             | -             | ✓            | -             | -            | -            | -            |         |

## 6.2 Details of Caution

### 6.2.1 About the I/O define header file

Please use Renesas iodef.h for the header file that defines the register. Because RH850 Smart Configurator outputs code conforming to the definition in Renesas iodef.h, a build error occurs when using the register definition file provided by other environments.

### 6.2.2 About loading the project on CS+

When launching RH850 Smart Configurator from CS+, please set 'RH850 Build tool CC-RH plugin' and 'RH850 Build tool GHS CCRH850 plugin' to enable. If these plugins are disable, the error occurs when CS+ project that includes the setting of RH850 Smart Configurator is loaded.

### 6.2.3 About the sample project

The RH850 Smart Configurator does not output the processing after resetting the microcontroller (including the startup routine).

Therefore, we provide sample projects that include sample startup routines and other necessary processing so that user applications can be built immediately after peripheral modules are set up using the RH850 Smart Configurator.

Please refer to the user guide for sample projects under installation path.

Default installation path:

C:\Program Files (x86)\Renesas Electronics\SmartConfigurator\RH850\

### 6.2.4 About the decimal point

For error-free operation of the RH850 Smart Configurator, use a period (".") as the decimal point and a comma (",") as the digit grouping separator. Which of "." (period), "," (comma) or " " (space) is used as the decimal point or digit grouping separator differs depending on the language setting of the Windows OS that is used. For example, if you use a comma (",") as the decimal point, the RH850 Smart Configurator may not work correctly. This will occur when you are using Windows OS with language set to other than Japanese or English. If you are using the RH850 Smart Configurator on Windows OS with language set to other than Japanese or English, change the language setting to Japanese or English.

### 6.2.5 Note on pins sharing functions

When function shared pin selects a shared pin, shared pin displays an error.

But the shared pin can be selected correctly and work correctly.

Example) For RH850/U2A RSENT0

Assign RSENT0RX and RSENT0SPCO to the T24 pin

When assigned: T24 pin displays an error

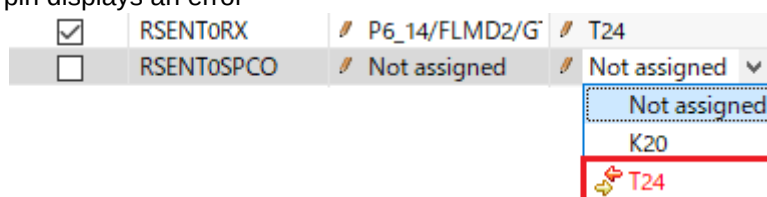


Figure 6-1. pins sharing function sample when assigned

After assignment

|                                     |            |               |     |
|-------------------------------------|------------|---------------|-----|
| <input checked="" type="checkbox"/> | RSENT0RX   | P6_14/FLMD2/G | T24 |
| <input checked="" type="checkbox"/> | RSENT0SPCO | P6_14/FLMD2/G | T24 |

Figure 6-2. pins sharing function sample after assigned

### 6.2.6 Note on Interrupt Controller resource name

In RH850 Smart Configurator V1.2.0, the resource name of the interrupt controller has been changed to "INTC". The resource name of the interrupt controller of the previous version is automatically changed from "ICU" to "INTC".

Therefore, the following file name and macro name are changed.

Table 6-2 File name change

| Before change | After change |
|---------------|--------------|
| r_cg_icu.h    | r_cg_intc.h  |

Table 6-3 Macro name change

| File name         | Before change    | After change      |
|-------------------|------------------|-------------------|
| r_smc_interrupt.h | ICU_xxx_PRIORITY | INTC_xxx_PRIORITY |

### 6.2.7 Note on DMA/DTS trigger generator setting of MSPI Master

If alternative trigger is selected in Smart Configurator for RH850 V1.5.0, when reloading the project file (.scfg file) into Smart Configurator for RH850 V1.6.0, the alternative trigger signal "Use alternative trigger" can't be reloaded and the default trigger signal "Trigger1(DTSMSPi12)/Trigger2(DTSMSPi13)" will be used.

There isn't this cautions when reloading project between Smart Configurator for RH850 V1.5.0 and before, or between Smart Configurator for RH850 V1.6.0 and later.

DMA/DTS trigger generator setting

☐ DMA ☒ DTS

Trigger1 Transmit status interrupt (INTMSPI0TX0) ▾

Trigger2 Receive status interrupt (INTMSPI0RX0) ▾

☒ Use alternative trigger

Trigger1 (Alternative) (DTSMSPi8)

Trigger2 (Alternative) (DTSMSPi9)

Figure 6-3. "Use alternative trigger" checked in Smart Configurator for RH850 V1.5.0

DMA/DTS trigger generator setting

☐ DMA trigger signal ☒ DTS trigger signal

Trigger1 Trigger1(DTSMSPi12)/Trigger2(DTSMSPi13)

Trigger2 Transmit status interrupt (INTMSPI0TX6)

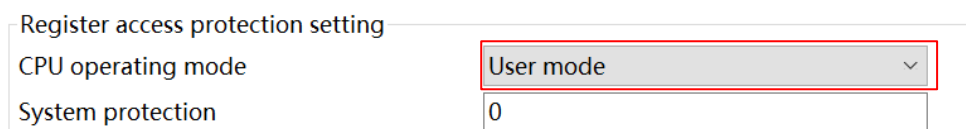
Receive status interrupt (INTMSPI0RX6)

Figure 6-4. "Trigger1(DTSMSPi12)/Trigger2(DTSMSPi13)" selected after reloading in Smart Configurator for RH850 V1.6.0

### 6.2.8 Note on CPU Operating mode of DTS Controller

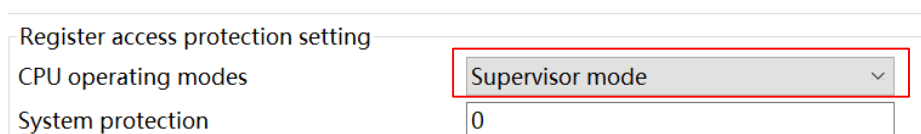
If CPU operating mode selects "User mode" in Smart Configurator for RH850 V1.5.0, after reloading the project in Smart Configurator for RH850 V1.6.0, CPU operating mode will be changed to "Supervisor mode" which is default setting.

There isn't this cautions when reloading project between Smart Configurator for RH850 V1.5.0 and before, or between Smart Configurator for RH850 V1.6.0 and later.



The screenshot shows the 'Register access protection setting' dialog box. The 'CPU operating mode' dropdown menu is set to 'User mode' and is highlighted with a red rectangle. The 'System protection' field is set to '0'.

Figure 6-5. CPU operating mode in Smart Configurator for RH850 V1.5.0



The screenshot shows the 'Register access protection setting' dialog box. The 'CPU operating modes' dropdown menu is now set to 'Supervisor mode' and is highlighted with a red rectangle. The 'System protection' field remains set to '0'.

Figure 6-6. CPU operating mode after reloading in Smart Configurator for RH850 V1.6.0

### 6.2.9 Note on using Smart Configurator when the OS language is Japanese

For RH850/U2x users, we recommend using Smart Configurator on English OS. If your OS is Japanese, you also can add "-Duser.language=en" to "<install directory>\SmartConfigurator\RH850\eclipse\SmartConfigurator.ini" file, then you can see English GUI in Smart Configurator. For RH850/U2x, Smart Configurator Japanese UI is just for your reference, and we do not recommend that you use it.

### 6.2.10 Note on changing device when using Error Control Module

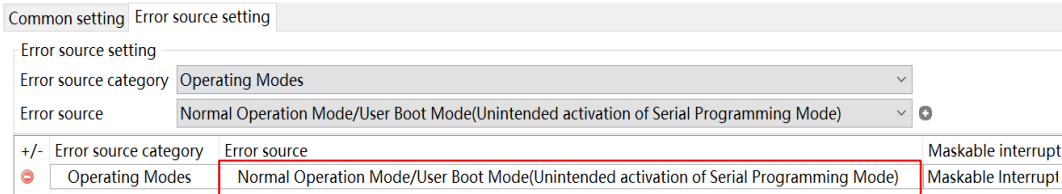
When using Error Control Module, we don't recommend changing device between RH850/U2A and RH850/C1M. Because most of the error sources of these two devices are different, the error sources can't migrate.

### 6.2.11 Note on reloading project for Error Control Module

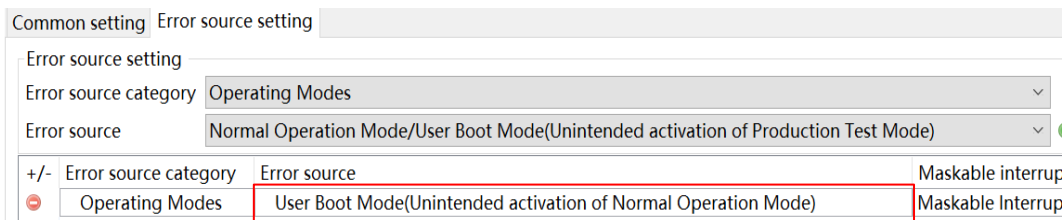
If user used some error sources of Error Control Module in the project created using Smart Configurator for RH850 V1.7.0 or earlier, when reloading the project using Smart Configurator for RH850 V1.8.0 or later, the error source will be different between the two versions.

Figure 6-7 and Figure 6-8 show the difference.

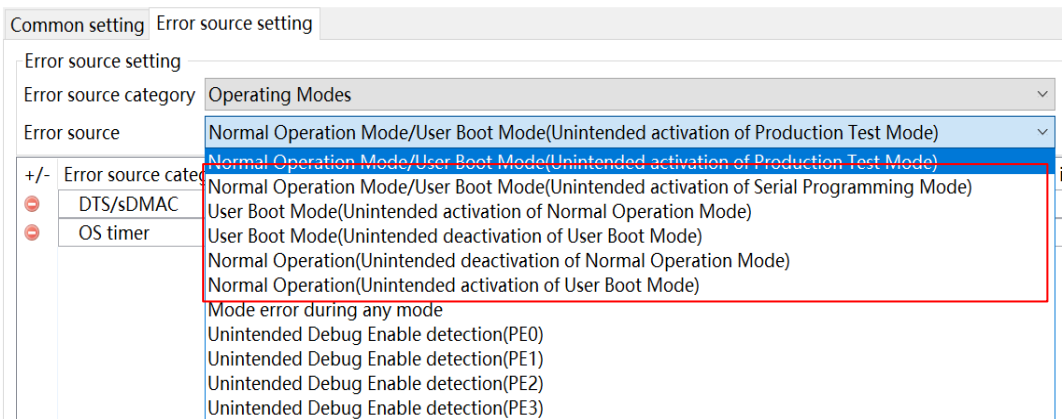
Figure 6-9 shows the error sources that have such issue.



**Figure 6-7. Error source added in Smart Configurator for RH850 V1.7.0 or earlier**



**Figure 6-8. Error source reloaded in Smart Configurator for RH850 V1.8.0 or later**



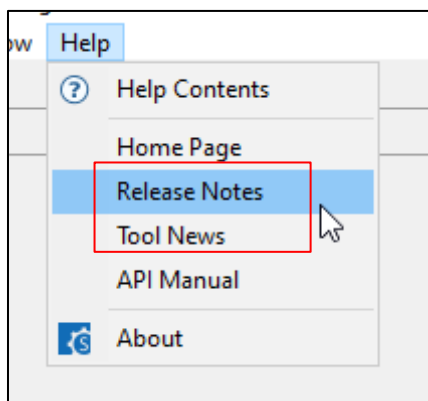
**Figure 6-9. Error sources that have such issue**

**6.2.12 Note on the “Release Notes”, “Tool News” display issue in Renesas Website**

For Smart Configurator for RH850 V1.7 or before version, release note or tools news might not be displayed correctly on Renesas Website after clicking the “Renesas Notes” or “Tool News” under the help menu of Smart Configurator. This issue has been fixed from this version.

As a workaround, please use the URL directly:

- Release Notes: <https://www.renesas.com/rh850-smart-configurator-release-note>
- Tool News: <https://www.renesas.com/rh850-smart-configurator-tn-notes>



**Figure 6-10 Help menu of Smart Configurator**



### 6.2.13 Note on using Smart Configurator for RH850 in CS+

When you want to use Smart Configurator for RH850 in CS+, Please take note to select below six kinds of projects in "Create project" dialog of CS+:

- Application(CC-RH) (for single-core devices, such as RH850/F1KM)
- Application for Multi-core(CC-RH) (for multi-core devices, such as RH850/C1M-A2, RH850/F1KH, RH850/U2A, RH850/U2B)
- Empty Application(CC-RH)
- Library(CC-RH)
- Empty Application(GHS CCRH850)
- Application(RI850V4,CC-RH)
- 

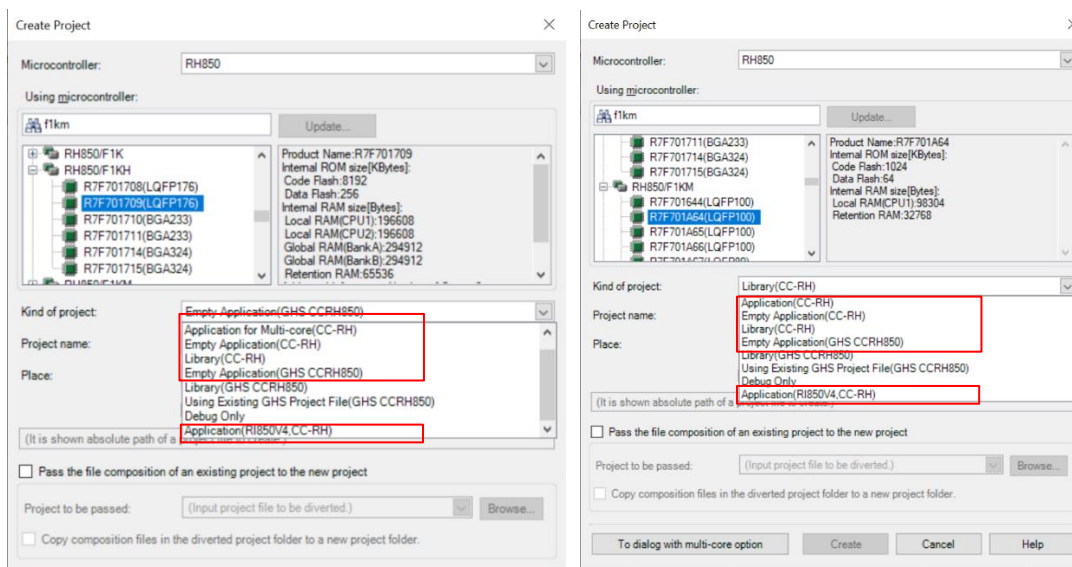


Figure 6-11 Kinds of project for multi-core devices and single-core devices

### 6.2.14 Note on using RH850/U2A devices

For RH850/U2A devices, if using Smart Configurator for RH850 in CS+ CC for V8.11.01 and later, please use Smart Configurator for RH850 V1.12.00 and later; when using Smart Configurator for RH850 in CS+ CC for V8.11.00 and before, please use Smart Configurator for RH850 V1.11.00 and before; otherwise, there would be build error because of the RH850/U2A device file update.

In e<sup>2</sup> studio 2024-04 there is build error too for RH850/U2A devices when using Smart Configurator for RH850. To avoid the build error, please use e<sup>2</sup> studio 2024-01, or e<sup>2</sup> studio 2024-07 or later.

Revision History

| Rev. | Section | Description          |
|------|---------|----------------------|
| 1.00 | -       | First edition issued |

# General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

## 1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity.

Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

## 2. Processing at power-on

The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

## 3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

## 4. Handling of unused pins

Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

## 5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

## 6. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between  $V_{IL}$  (Max.) and  $V_{IH}$  (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between  $V_{IL}$  (Max.) and  $V_{IH}$  (Min.).

## 7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

## 8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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