Smart Configurator for RISC-V MCU Plug-in in e² studio 2025-04
Smart Configurator for RISC-V MCU V1.4.0
Release Note

Introduction
Thank you for using the Smart Configurator for RISC-V MCU.
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.
Smart Configurator for RISC-V MCU V1.4.0 is equivalent to Smart Configurator for RISC-V MCU Plug-in in e^2 studio 2025-04.

1.1 System Requirements

The operating environment is as follows.

1.1.1 Windows PC

- System: x64/x86 based processor
  Windows® 11
  Windows® 10 (64-bit version)
- Memory capacity: We recommend 4 GB or more.
- Capacity of hard disk: At least 300 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 RISC-V MCU plug-in in e^2 studio 2024-07 or later is supported on Linux OS.

- System: x64 based processor, 2 GHz or faster (with multicore CPUs)

  Ubuntu 24.04 LTS Desktop (64-bit version)
  Ubuntu 22.04 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

- Windows

  LLVM for Renesas RISC-V 17.0.2.202401 or later
  IAR Embedded Workbench for RISC-V 3.30.1 or later
  SEGGER Embedded Studio for RISC-V 8.10 or later

- Linux

  LLVM for Renesas RISC-V 17.0.2.202406 or later
  IAR bxriscv-3.30.1 or later
  SEGGER Embedded Studio 8 for RISC-V 8.12a or later

2. Support List

2.1 Support Devices List

Below is a list of devices supported by the Smart Configurator for RISC-V MCU V1.4.0.

Table 2-1 Support Devices

Group (HW Manual number)	PIN	Device name
RISC-V/G021 Group (R01UH1036EJ0110)	16pin	R9A02G0214CBY
	24pin	R9A02G0214CNK
	32pin	R9A02G0214CNH
	48pin	R9A02G0214CNE

2.2 Support Components List

Below is a list of Components supported by the Smart Configurator for RISC-V MCU V1.4.0.

Table 2-2 Support Components ✓: Support (*), -: Non-support

No	Components	Mode	G021	Remarks
1	A/D Converter	-	✓	
2	Comparator	-	✓	
3	D/A Converter	-	✓	
4	Data Transfer Controller	-	✓	
5	Delay Counter	-	✓	
6	Divider Function	-	✓	
7	Event Link Controller	-	✓	
8	External Event Counter	-	✓	
9	IIC Communication (Master mode)	-	✓	
10	IIC Communication (Slave mode)	-	✓	
11	Input Pulse Interval/Period Measurement	-	✓	
12	Input Signal High-/Low-Level Width Measurement	-	✓	
13	Interrupt Controller	-	✓	
14	Interval Timer	8 bit count mode	✓	
		16 bit count mode	✓	
		16 bit capture mode	✓	
		32 bit count mode	✓	
15	Key Interrupt	-	✓	
16	One-Shot Pulse Output	-	✓	
17	Ports	-	✓	
18	PWM Output	-	✓	
19	Real-Time Clock	-	✓	
20	Remote Control Signal Receiver	-	✓	
21	Simple SPI Communication	Transmission	✓	
		Reception	✓	
		Transmission/reception	✓	
22	Square Wave Output	-	✓	
23	UART Communication	Transmission	✓	
		Reception	✓	
		Transmission/reception	✓	
24	Voltage Detector	-	✓	
25	Watchdog Timer	-	✓	

2.3 New support

2.3.1 Support CMake generation for Smart Configurator with Visual Studio Code

From Smart Configurator for RISC-V MCU V1.4.0, when using Visual Studio Code (VS Code) with Renesas Debug extension v25.6.2 or later to create RISC-V MCU project by choosing “Renesas: Create RISC-V MCU project with Smart Configurator”, CMake project is generated for easier build the driver code generated by Smart Configurator for RISC-V MCU on Visual Studio Code. LLVM toolchain is supported for CMake generation. Both Windows OS and Linux OS are supported. For detailed how to use the CMake generation for Smart Configurator, please refer to Renesas VS Code Extensions User Guide.

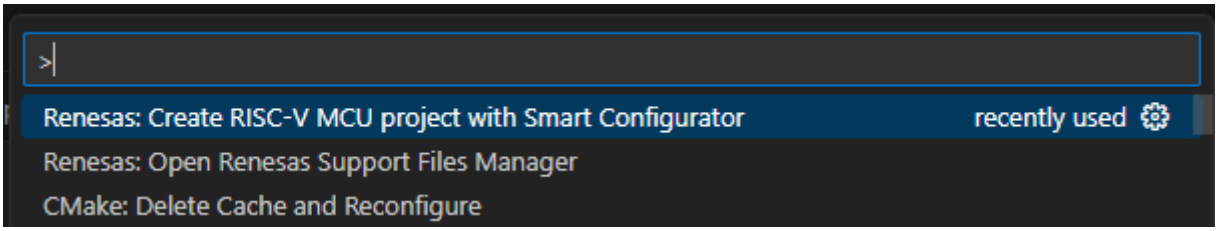

Figure 2-1 Select “Renesas: Create RISC-V MCU project with Smart Configurator” in VS Code

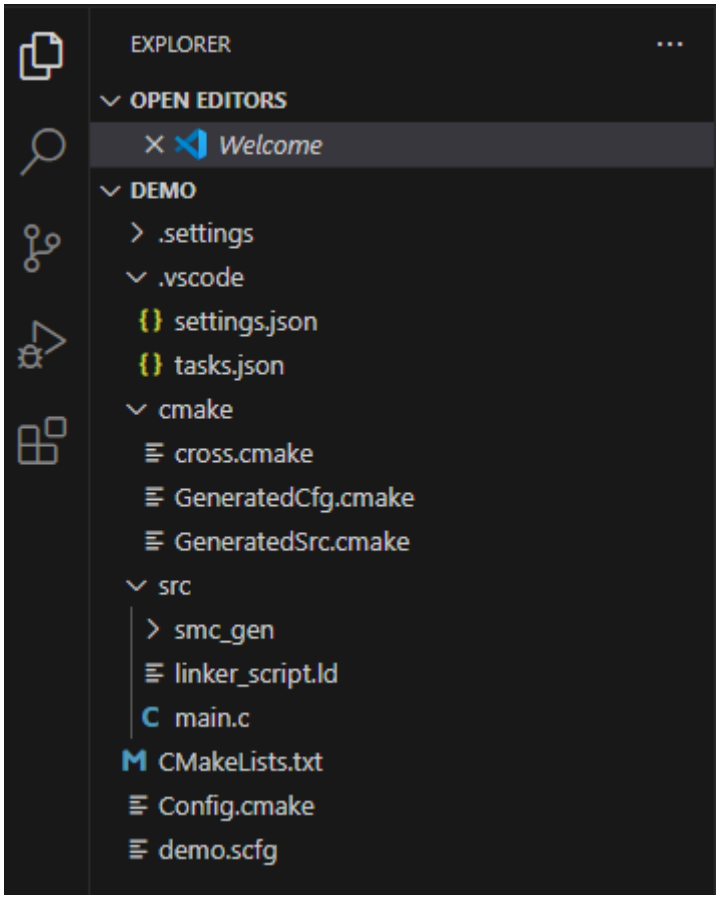

Figure 2-2 CMake LLVM project created for VS Code

2.3.2 Show preferences link at Overview tab

From Smart Configurator for RISC-V MCU V1.4.0, there is a link at Overview tab to help users quickly navigate to preferences setting.

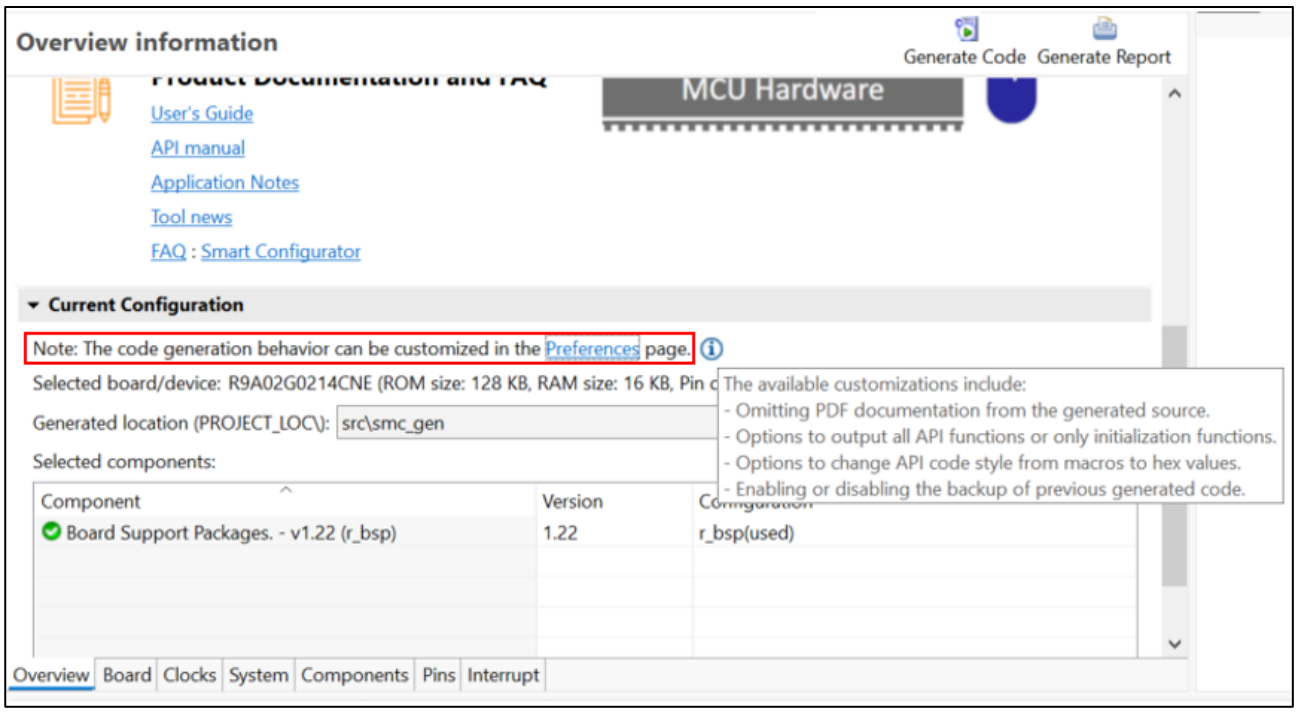

Figure 2-3 Preferences link at Overview tab

2.3.3 Support searching for property grid configuration

From Smart Configurator for RISC-V MCU V1.4.0, a search text box is added at property grid configuration to help users quickly find a configuration name or macro name.

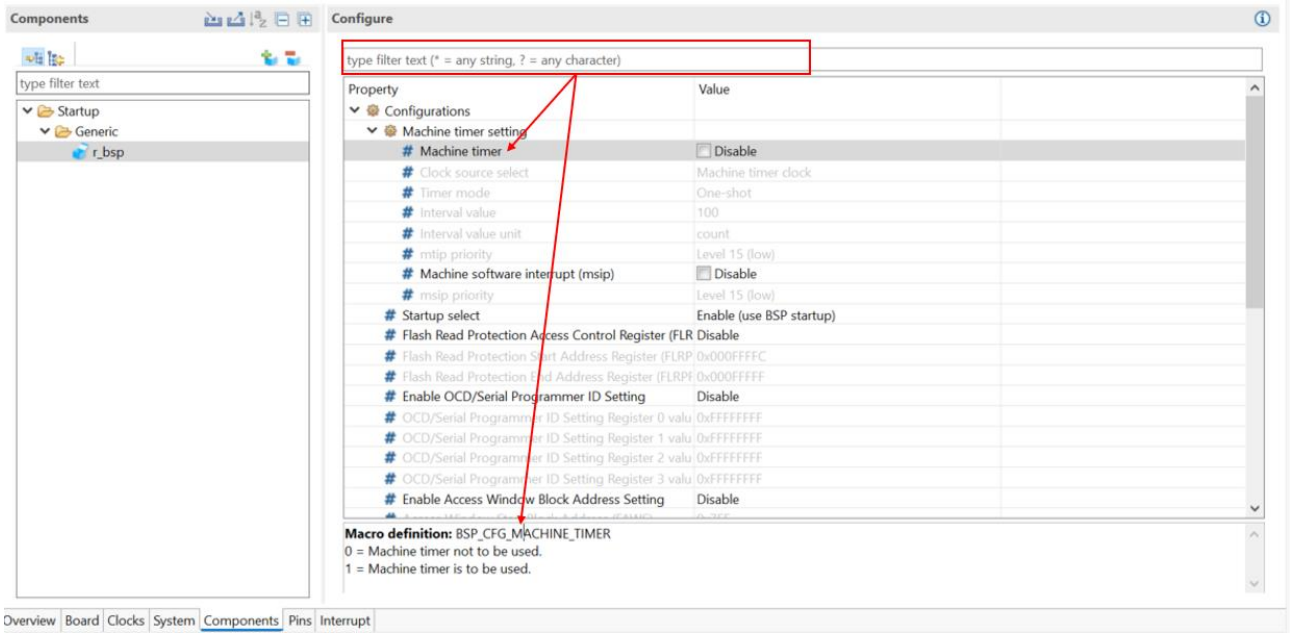

Figure 2-4 Search text box at property grid configuration

3. Changes

This chapter describes changes to the Smart Configurator for RISC-V MCU V1.4.0.

3.1 Specification changes

Table 3-1 List of Correction of issues/limitations ✓: Applicable, -: Not Applicable

No	Description	G021	Remarks
1	Improve blinky sample project in e² studio version	✓	

3.1.1 Improve blinky sample project in e² studio version

From Smart Configurator for RISC-V MCU V1.4.0, blinky sample project is improved to blink 2 LEDs with different frequency.

```
*  File Name    : blinky.c
#include "r_smc_entry.h"

volatile uint32_t blinkDelay = 500; // Initial blink delay of 0.5 second (on + off is 1Hz)

int main(void);

int main(void)
{
    /* Start SW Interrupt */
    R_Config_ICU_IRQ4_Start();

    /* use count to toggle alternatively 2 LEDs */
    uint32_t count = 0;

    /* WAIT_LOOP */
    while (1) {

        count++;

        /* Write to the first LED pin */
        PIN_WRITE(LED1) = ~PIN_READ(LED1);

        if ((count % 2) == 0) {
            /* Write to the second LED pin */
            PIN_WRITE(LED2) = ~PIN_READ(LED2);
        }

        /* Delay blinkDelay milliseconds before returning */
        R_BSP_SoftwareDelay(blinkDelay, BSP_DELAY_MILLISECS);
    }
    return 0;
}
```

Figure 3-1 Improved code of blinky sample project

4. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RISC-V MCU V1.4.0.

4.1 List of Limitation

Table 4-1 List of Limitation ✓: Applicable, -: Not Applicable

No	Description	G021	Remarks
1	Note on extra help document issue	✓	
2	Note on UI display with High Contrast theme on Linux OS	✓	

4.2 Details of Limitation

4.2.1 Note on extra help document issue

For Smart Configurator, there is an extra help "Smart Browser" under "[Help] > [Help Contents]".
Please ignore it.

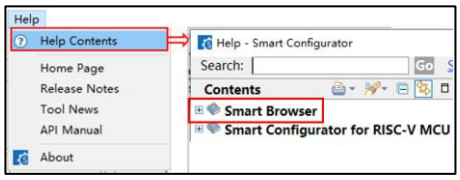

Figure 4-1 Extra help issue

4.2.2 Note on UI display with High Contrast theme on Linux OS

When using e² studio with High Contrast theme on Linux OS, some display texts of Smart Configurator cannot be seen.
To avoid this issue, please use other themes.

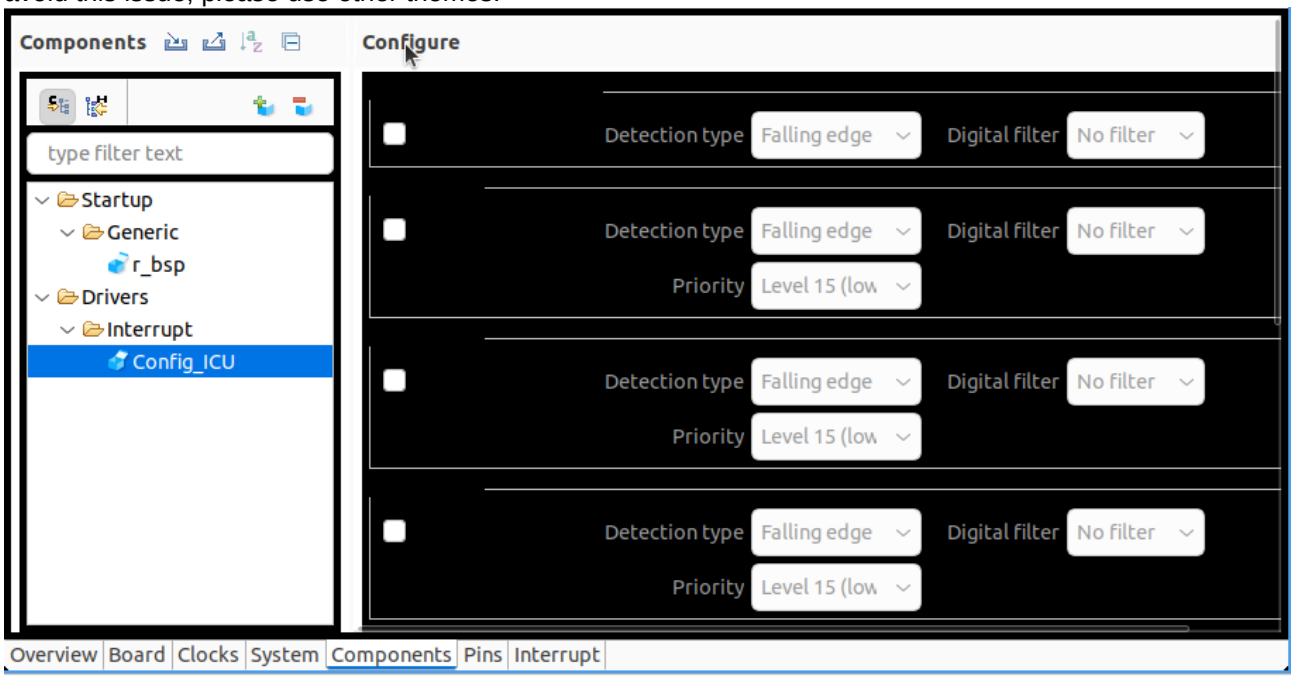

Figure 4-2 UI display with High Contrast theme

5. Points for Caution

This section describes points for caution regarding the Smart Configurator for RISC-V MCU V1.4.0.

5.1 List of Caution

Table 5-1 List of Caution **✓: Applicable, -: Not Applicable**

No	Description	G021	Remarks
1	Note on the installation of the Smart Configurator	✓	
2	Note on the include path update issue when renaming the component's configuration name	✓	
3	Note on TAU Input Signal High/Low level Measurement components.	✓	
4	Note on using the user code protection feature	✓	
5	Note on the build error when an interrupt is not allocated to any interrupt vector	✓	
6	Note on SIS modules cannot be showed in New Component window	✓	
7	Note on the start address 00000000 is not from start.s file function for Blinky CPP LLVM project	✓	
8	Note on the issue when opening the emProject file in SEGGER	✓	

5.2 Details of Caution

5.2.1 Note on the installation of the Smart Configurator

Do not set more than 64 characters for the installation directory.
The user might see an error message "The specified path is too long" and will not be able to install Smart Configurator.

5.2.2 Note on the include path update issue when renaming the component's configuration name

When renaming the added component's configuration in e² studio Smart Configurator project that has self-defined include path setting for any folder or file, include path setting for that folder or file will keep the old name setting after code generation. This will cause build error when compiling the newly generated codes so please manually update the include path.

The folder or file which has self-defined include path setting can be recognized by checking the overlay icon ( ) on that folder or file. Below is an example on how to handle the include path update after renaming Compare Match Timer component configuration.

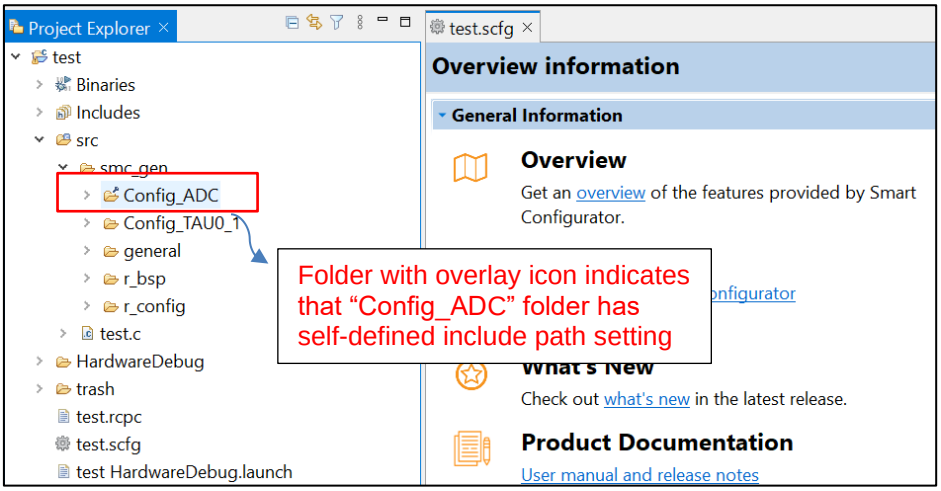

Figure 5-1 Interval Timer component configuration before renaming

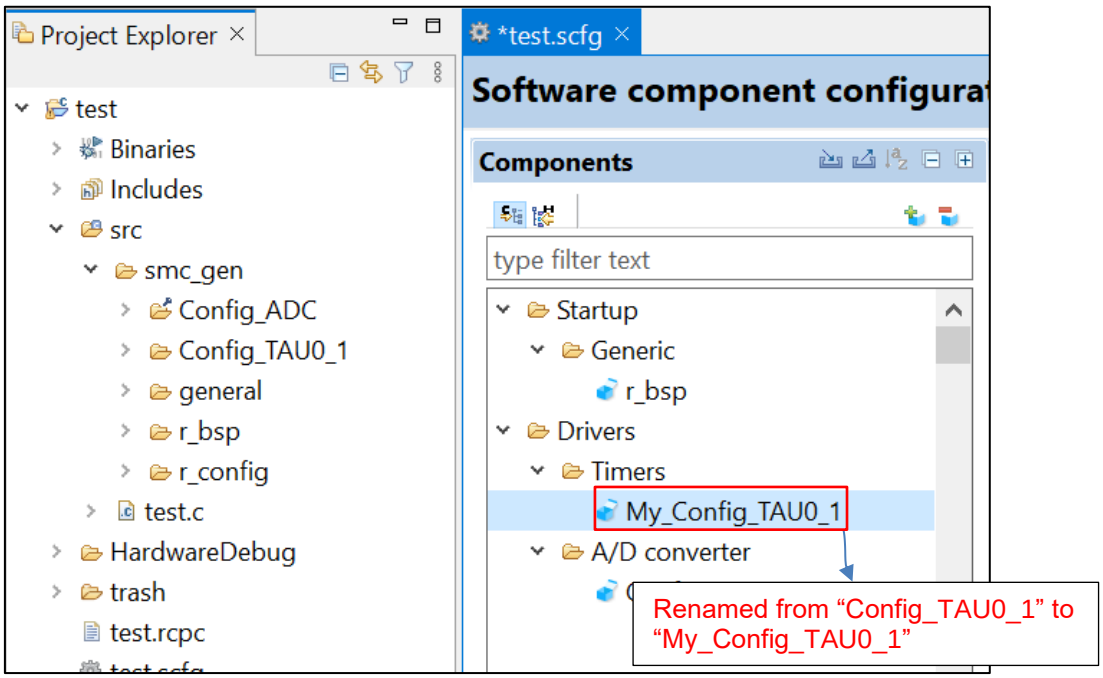

Figure 5-2 The Interval Timer component configuration after renaming

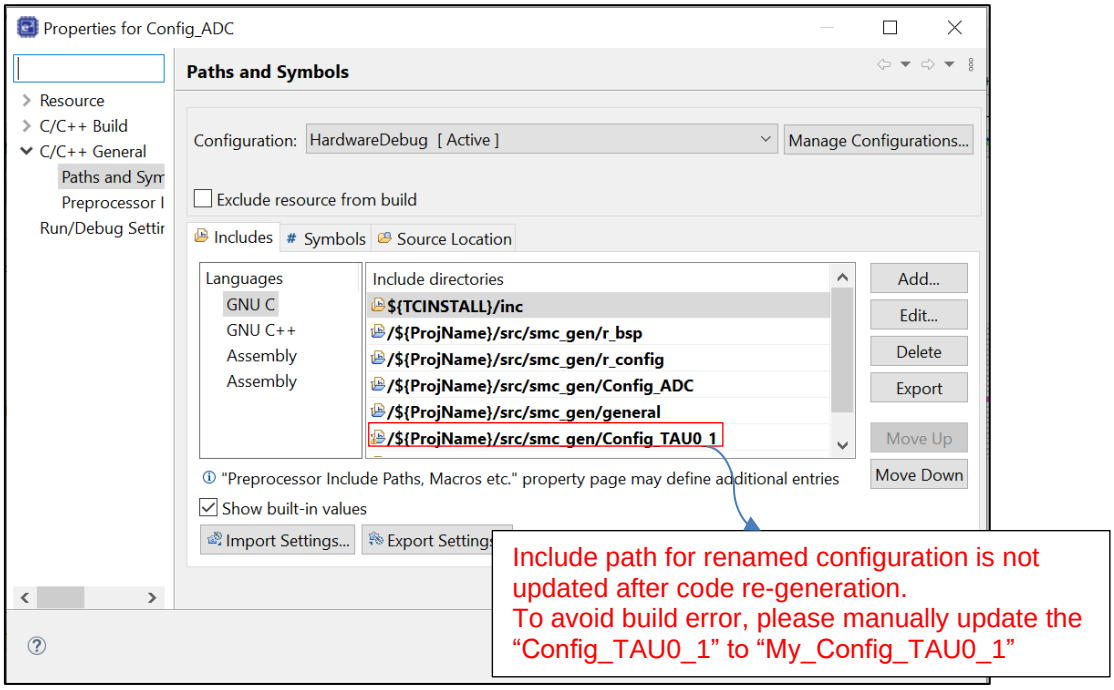

Figure 5-3 Include path setting for the “Config_ADC” configuration

5.2.3 Note on TAU Input Signal High/Low level Measurement component

When using TAU Input Signal High/Low level Measurement component, after used noise filter function for TImn input pulse, please make sure the High/Low level width min value needs to be greater than two times the minimum value prompted on the UI.
For example, the High/Low level width min value is 0.032us (min value), when use noise filter function, the width min value should be 0.064us.

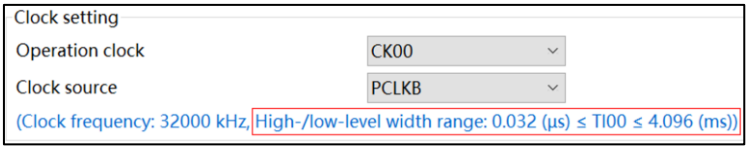

Figure 5-4 High/Low level width min value

5.2.4 Note on using the user code protection feature

The user code protection feature will be supported for all Code Generation components. Please use the following specific tags to add user code when using the user code protection feature. If the specific tags do not match exactly, inserted user code will not be protected after the code generation.

```
/* Start user code */

User code can be added between the specific tags

/* End user code */
```

5.2.5 Note on the build error when an interrupt is not allocated to any interrupt vector

Use IRQ0 as example, when IRQ0 is used in interrupt component, but an interrupt error is shown in “Configuration Problems” window. It means all interrupt vectors which can used by IRQ0 have been used.

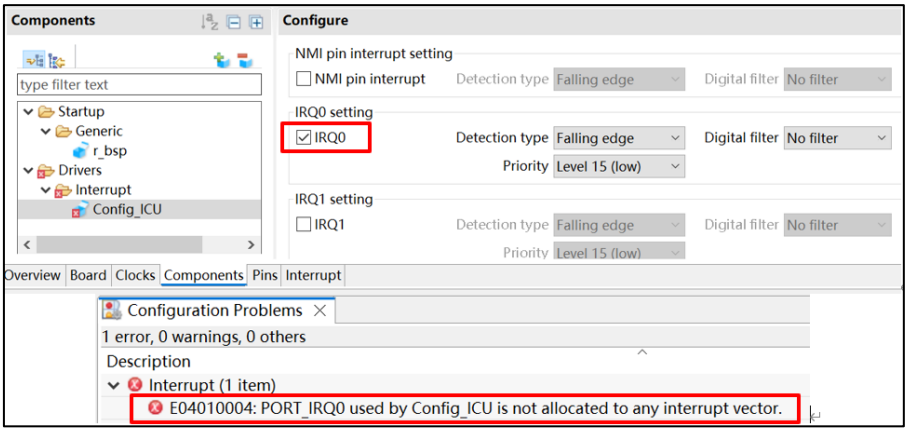

Figure 5-5 An interrupt is not allocated to any interrupt vector

When you generate code, some build error will be shown:

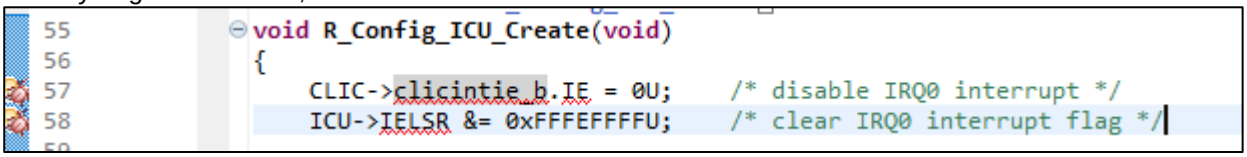

Figure 5-6 Build errors when an interrupt is not allocated to any interrupt vector

To solve these build errors, please refer to Smart Configurator User's Manual e^2 studio or IAREW, SEGGER Embedded Studio chapter 4.6.4 Resolving Interrupt error.

5.2.6 Note on the start address 00000000 is not from start.s file function for Blinky CPP LLVM project

When using a Blinky CPP LLVM project, the start addresse 00000000 is not from start.s file function.

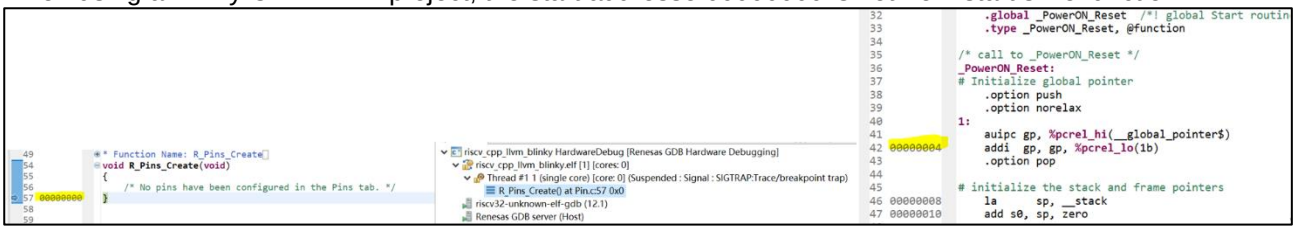

Figure 5-7 Incorrect function of start address 00000000

Correct start function address should in BSP start.s file and *_PowerON_Reset*().

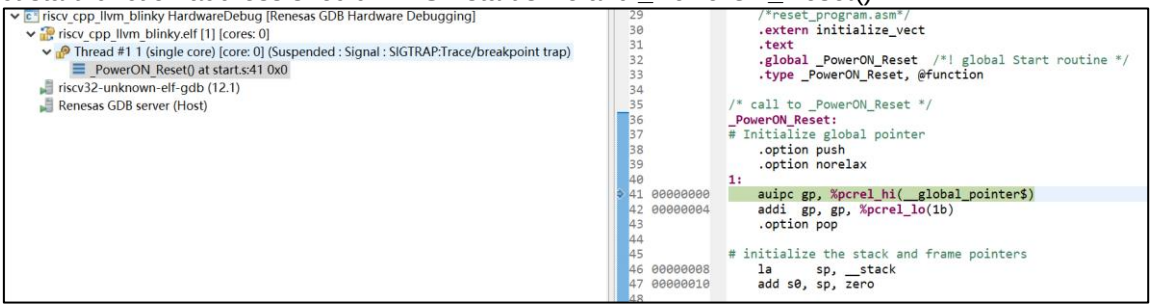

Figure 5-8 Start address 00000000 is from start.s file and _PowerON_Reset()

As a workaround, please changed the [Debug format] to dwarf-2 or dwarf-3:

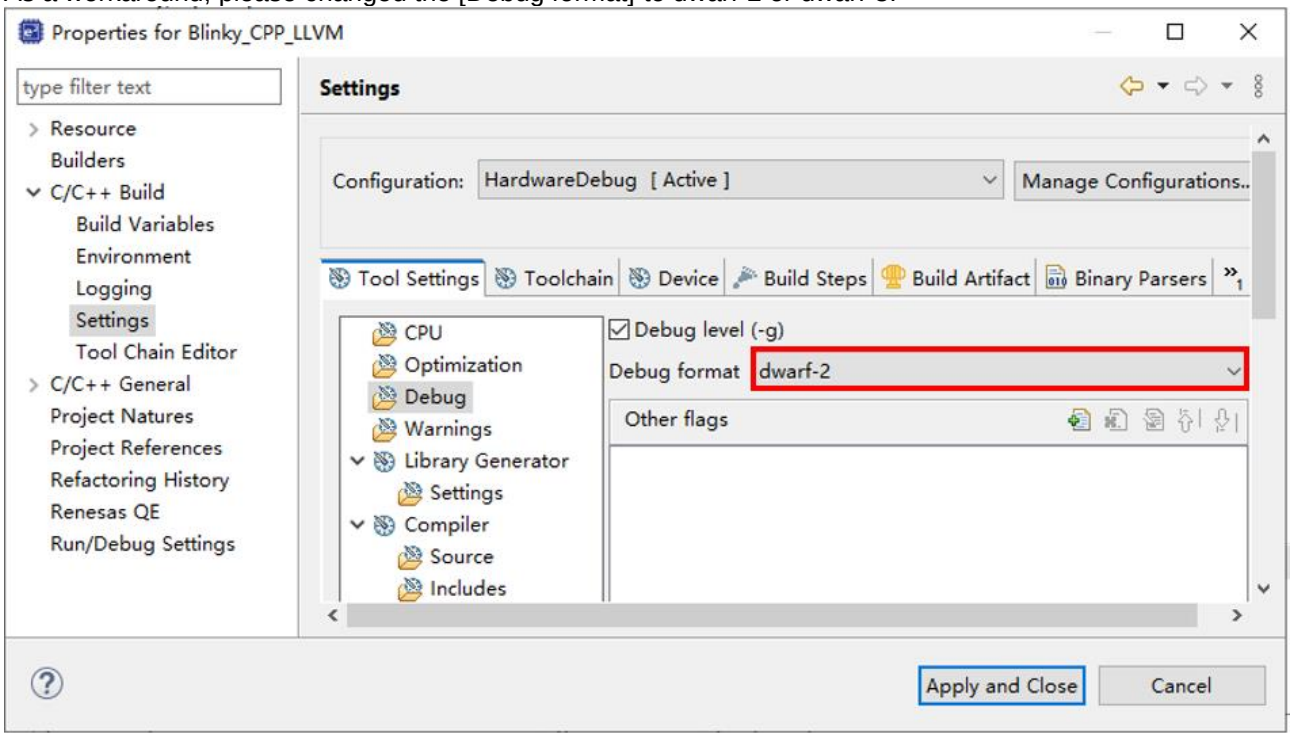

Figure 5-9 Change the [Debug format] CPP LLVM project

5.2.7 Note on the issue when opening the emProject file in SEGGER

When opening the emProject file generated by SEGGER. The following prompt box will be pop up.

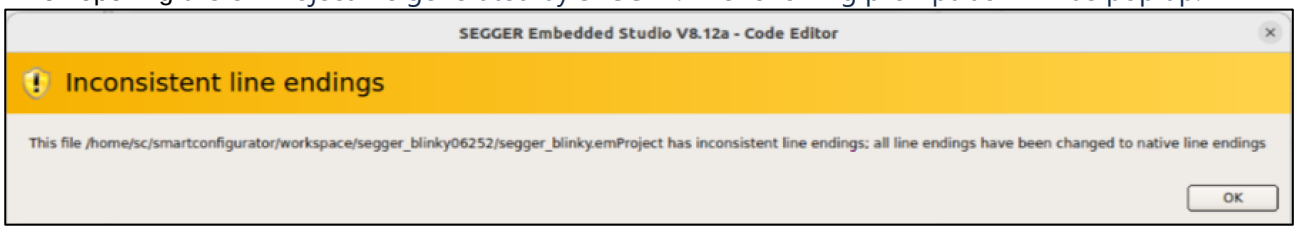

Figure 5-10 The issue when opening the emProject file

As a workaround, please "Ctrl + A" right-click change Line ending to “Unix”.

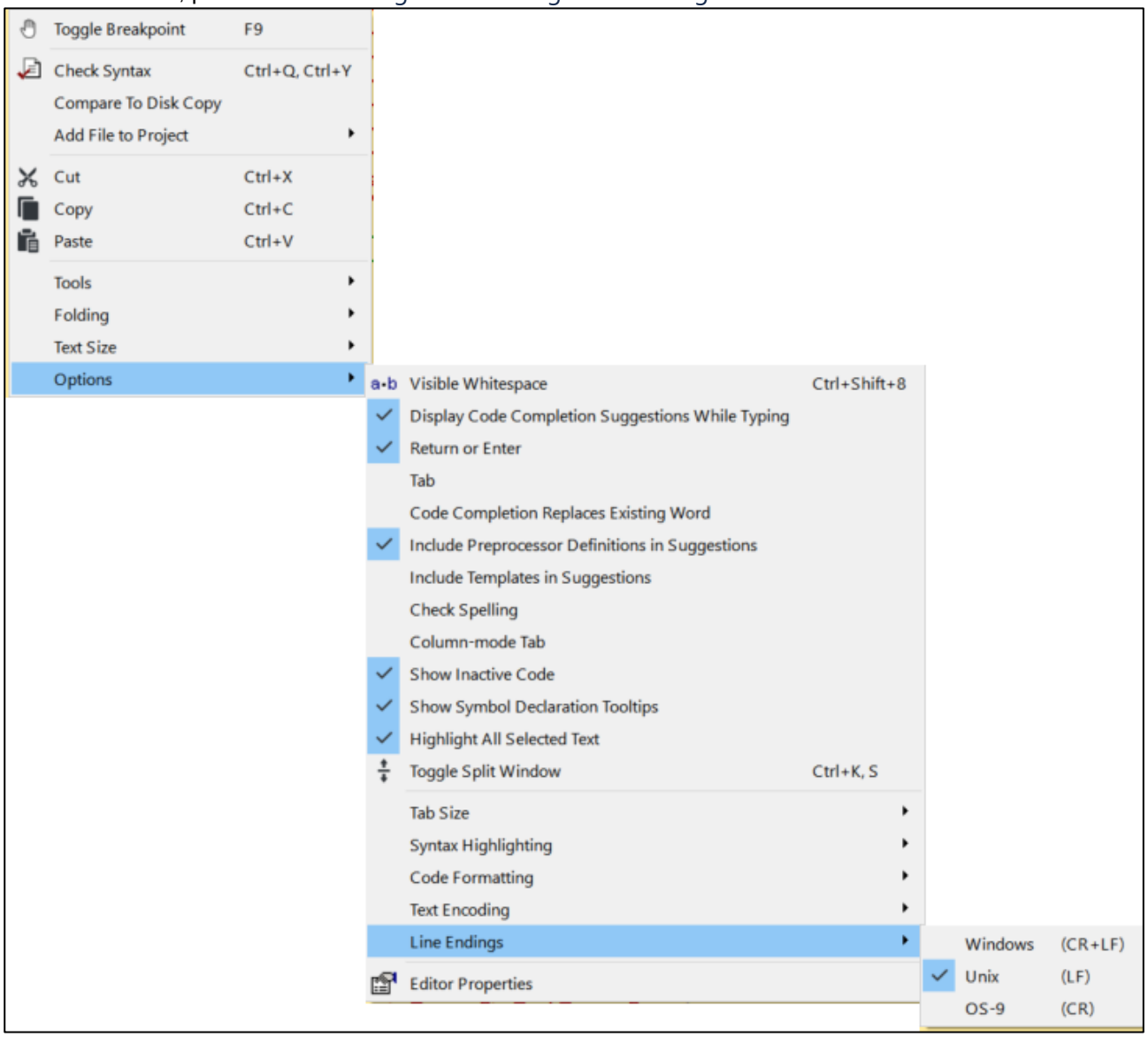

Figure 5-10 Change Line ending to “Unix”

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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