Smart Configurator for RL78 Plug-in in e² studio 2023-07
Smart Configurator for RL78 V1.7.0
Release Note

Introduction
Thank you for using the Smart Configurator for RL78.
This document describes the restrictions and points for caution. Read this document before using the product.

Contents

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 RL78 V1.7.0 is equivalent to Smart Configurator for RL78 Plug-in in e2 studio 2023-07.

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)
  - Windows® 8.1 (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 RL78 plug-in in e2 studio 2023-01 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 RL78 [CC-RL] V1.12 or later
- LLVM for Renesas RL78 10.0.0.202209 or later
- IAR Embedded Workbench for Renesas RL78 V5.10.1 or later
- SMS Assembler Note1 V1.00.00 or later
- FAA Assembler Note2 V1.04.02 or later

Note:

1. If you want to add SMS Assembler to e2 studio, install it from the integrated installer of e2 studio 21-04 or later. (e2 studio)

   As with other compilers, select and install from the [Additional Software] - [Renesas Toolchains & Utilities] tab of the e2 studio setup wizard.

2. If you want to add FAA Assembler to e2 studio, install it from the integrated installer of e2 studio 23-04 or later. (e2 studio)

   As with other compilers, select and install from the [Additional Software] - [Renesas Toolchains & Utilities] tab of the e2 studio setup wizard.

2. Support List

2.1 Support Devices List

Below is a list of devices supported by the Smart Configurator for RL78 V1.7.0.

Table 2-1 Support Devices (1/2)

Group (HW Manual number)	PIN	Device name
RL78/G23 Group (R01UH0896EJ0120)	30pin	R7F100GAFxSP, R7F100GAGxSP, R7F100GAHxSP, R7F100GAJxSP
	32pin	R7F100GBFxNP, R7F100GBGxNP, R7F100GBHxNP, R7F100GBJxNP, R7F100GBFxFP, R7F100GBGxFP, R7F100GBHxFP, R7F100GBJxFP
	36pin	R7F100GCFxLA, R7F100GCGxLA, R7F100GCHxLA, R7F100GCJxLA
	40pin	R7F100GEFxNP, R7F100GEGxNP, R7F100GEHxNP, R7F100GEJxNP
	44pin	R7F100GFFxFP, R7F100GFGxFP, R7F100GFHxFP, R7F100GFJxFP, R7F100GFKxFP, R7F100GFLxFP, R7F100GFNxFP
	48pin	R7F100GGFxFB, R7F100GGGxFB, R7F100GGHxFB, R7F100GGJxFB, R7F100GGKxFB, R7F100GGLxFB, R7F100GGNxFB, R7F100GGFxNP, R7F100GGGxNP, R7F100GGHxNP, R7F100GGJxNP, R7F100GGKxNP, R7F100GGLxNP, R7F100GGNxNP
	52pin	R7F100GJFxFA, R7F100GJGxFA, R7F100GJHxFA, R7F100GJJxFA, R7F100GJKxFA, R7F100GJLxFA, R7F100GJNxFA
	64pin	R7F100GLFxFA, R7F100GLGxFA, R7F100GLHxFA, R7F100GLJxFA, R7F100GLKxFA, R7F100GLLxFA, R7F100GLNxFA, R7F100GLFxFB, R7F100GLGxFB, R7F100GLHxFB, R7F100GLJxFB, R7F100GLKxFB, R7F100GLLxFB, R7F100GLNxFB, R7F100GLFxLA, R7F100GLGxLA, R7F100GLHxLA, R7F100GLJxLA, R7F100GLKxLA, R7F100GLLxLA, R7F100GLNxLA
	80pin	R7F100GMGxFA, R7F100GMHxFA, R7F100GMJxFA, R7F100GMKxFA, R7F100GMLxFA, R7F100GMNxFA, R7F100GMGxFB, R7F100GMHxFB, R7F100GMJxFB, R7F100GMKxFB, R7F100GMLxFB, R7F100GMNxFB
	100pin	R7F100GPGxFB, R7F100GPHxFB, R7F100GPJxFB, R7F100GPKxFB, R7F100GPLxFB, R7F100GPNxFB, R7F100GPGxFA, R7F100GPHxFA, R7F100GPJxFA, R7F100GPKxFA, R7F100GPLxFA, R7F100GPNxFA
	128pin	R7F100GSJxFB, R7F100GSKxFB, R7F100GSLxFB, R7F100GSNxFB
RL78/F24 Group (R01UH0944EJ0100)	32pin	R7F124FBJ3xNP, R7F124FBJ4xNP, R7F124FBJ5xNP
	48pin	R7F124FGJ3xFB, R7F124FGJ4xFB, R7F124FGJ5xFB
	64pin	R7F124FLJ3xFB, R7F124FLJ4xFB, R7F124FLJ5xFB
	80pin	R7F124FMJ3xFB, R7F124FMJ4xFB, R7F124FMJ5xFB
	100pin	R7F124FPJ3xFB, R7F124FPJ4xFB, R7F124FPJ5xFB
RL78/G15 Group (R01UH0959EJ0100)	8pin	R5F12008xNS, R5F12007xNS
	10pin	R5F12018xSP, R5F12017xSP
	16pin	R5F12048xNA, R5F12047xNA, R5F12048xSP, R5F12047xSP
	20pin	R5F12068xSP, R5F12067xSP
RL78/F23 Group (R01UH0944EJ0100)	32pin	R7F123FBG3xNP, R7F123FBG4xNP, R7F123FBG5xNP
	48pin	R7F123FGG3xFB, R7F123FGG4xFB, R7F123FGG5xFB
	64pin	R7F123FLG3xFB, R7F123FLG4xFB, R7F123FLG5xFB
	80pin	R7F123FMG3xFB, R7F123FMG4xFB, R7F123FMG5xFB
RL78/G22 Group (R01UH0978EJ0100)	16pin	R7F102G4ExNP, R7F102G4CxNP
	20pin	R7F102G6ExSP, R7F102G6CxSP
	24pin	R7F102G7ExNP, R7F102G7CxNP
	25pin	R7F102G8ExLA, R7F102G8CxLA
	30pin	R7F102GAExSP, R7F102GACxSP
	32pin	R7F102GBExNP, R7F102GBCxNP, R7F102GBExFP, R7F102GBCxFP
	36pin	R7F102GCExLA, R7F102GCCxLA
	40pin	R7F102GEExNP, R7F102GECxNP
	44pin	R7F102GFExFP, R7F102GFCxFP
	48pin	R7F102GGExFB, R7F102GGExNP, R7F102GGCxFB, R7F102GGCxNP

Table 2-2 Support Devices (2/2)

Group (HW Manual number)	PIN	Device name
RL78/G24 Group (R01UH0961EJ0100)	20pin	R7F101G6GxSP, R7F101G6ExSP
	24pin	R7F101G7GxNP, R7F101G7ExNP
	25pin	R7F101G8GxLA, R7F101G8ExLA
	30pin	R7F101GAGxSP, R7F101GAExSP
	32pin	R7F101GBGxNP, R7F101GBExNP, R7F101GBGxFP, R7F101GBExFP
	40pin	R7F101GEGxNP, R7F101GEExNP
	44pin	R7F101GFGxFP, R7F101GFExFP
	48pin	R7F101GGGxFB, R7F101GGExFB, R7F101GGGxNP, R7F101GGExNP
	52pin	R7F101GJGxFA, R7F101GJExFA
	64pin	R7F101GLGxFA, R7F101GLGxFB, R7F101GLExFA, R7F101GLExFB
RL78/G16 Group (R01UH0980EJ0100)	10pin	R5F1211AxSP, R5F1211CxSP
	16pin	R5F1214AxNA, R5F1214AxSP, R5F1214CxNA, R5F1214CxSP
	20pin	R5F1216AxSP, R5F1216CxSP
	24pin	R5F1217AxNA, R5F1217CxNA
	32pin	R5F121BAxFP, R5F121BAxNA, R5F121BCxFP, R5F121BCxNA

2.2 Support Components List

Below is a list of Components supported by the Smart Configurator for RL78 V1.7.0.

Table 2-3 Support Components (1/2) ✓: Support, -: Non-support

No	Components	Mode	RL78/G23	RL78/F24	RL78/G15	RL78/F23	RL78/G22	RL78/G16	RL78/G24	Remarks
1	12 Bit A/D Single Scan	-	-	✓	-	✓	-	-	-	
2	12 Bit A/D Continuous Scan	-	-	✓	-	✓	-	-	-	
3	12 Bit A/D Group Scan	-	-	✓	-	✓	-	-	-	
4	A/D Converter	Normal mode	✓	-	✓	-	✓	✓	✓	Only RL78/G24 A/D converter has mode selection GUI. For other devices, the default mode is "Normal mode" and no GUI is provided for mode selection.
		Advanced mode	-	-	-	-	-	-	✓	
5	Clock Output/Buzzer Output Controller	-	✓	✓	✓	✓	✓	✓	✓	
6	Comparator	-	✓	✓	✓	-	-	✓	✓	
7	D/A Converter	-	✓	✓	-	-	-	-	✓	
8	Data Transfer Controller	-	✓	✓	-	✓	✓	-	✓	
9	Delay Counter	-	✓	✓	✓	✓	✓	✓	✓	
10	Divider Function	-	✓	✓	✓	✓	✓	✓	✓	
11	Event Link Controller	-	–	✓	–	-	✓	–	✓	
12	External Event Counter	-	✓	✓	✓	✓	✓	✓	✓	
13	IIC Communication (Master mode)	-	✓	✓	✓	✓	✓	✓	✓	
14	IIC Communication (Slave mode)	-	✓	✓	✓	✓	✓	✓	✓	
15	Input Capture Function	-	–	✓	–	✓	–	–	✓	
16	Input Pulse Interval/Period Measurement	-	✓	✓	✓	✓	✓	✓	✓	
17	Input Signal High-/Low-Level Width Measurement	-	✓	✓	✓	✓	✓	✓	✓	
18	Interrupt Controller	-	✓	✓	✓	✓	✓	✓	✓	
19	Interval Timer	8 bit count mode	✓	✓	✓	✓	✓	✓	✓	
		12 bit count mode	–	–	✓	–	–	✓	–	
		16 bit count mode	✓	✓	✓	✓	✓	✓	✓	
		16 bit capture mode	✓	-	-	-	✓	-	✓	
		32 bit count mode	✓	-	-	-	✓	-	✓	
20	Key Interrupt	-	✓	✓	-	✓	✓	-	✓	
21	One-Shot Pulse Output	One-Shot Pulse Output	✓	✓	✓	✓	✓	✓	✓	
		Two-Channel Input with One-Shot Pulse Output	–	–	✓	–	–	✓	-	
22	Output Compare Function	-	–	✓	–	✓	–	–	✓	
23	Ports	-	✓	✓	✓	✓	✓	✓	✓	
24	PWM Option Unit A	-	–	✓	–	✓	–	-	✓	
25	DALI Communication (Control devices)	-	–	–	–	–	–	–	✓	
26	DALI Communication (Control gear)	-	–	–	–	–	–	–	✓	
27	Real-Time Clock	-	✓	✓	–	✓	✓	✓	✓	

Table 2-4 Support Components (2/2) ✓: Support, -: Non-support

No	Components	Mode	RL78/G23	RL78/F24	RL78/G15	RL78/F23	RL78/G22	RL78/G16	RL78/G24	Remarks
28	PWM Output	PWM Mode	✓	✓	✓	✓	✓	✓	✓	
		PWM3 Mode	–	✓	–	✓	–	–	✓	
		Extended PWM Mode	–	✓	–	✓	–	-	✓	
		PWM2 Mode	–	–	–	–	–	–	✓	
		Timer KB3 PWM Output Gate Mode	–	–	–	–	–	–	✓	
		Standalone Mode (Period controlled by the TKBCRn0 register)	–	–	–	–	–	–	✓	
		Standalone Mode (Period controlled by external trigger input)	–	–	–	–	–	–	✓	
		Simultaneous Start/Stop Mode (Period controlled by the TKBCRn0 register)	–	–	–	–	–	–	✓	
		Simultaneous Start/Stop Mode (Period controlled by external trigger input)	–	–	–	–	–	–	✓	
		Simultaneous Start/Clear Mode (Period controlled by master)	–	–	–	–	–	–	✓	
		Interleaved PFC Output Mode	–	–	–	–	–	–	✓	
29	Remote Control Signal Receiver	-	✓	–	–	–	–	–	–	
30	SNOOZE Mode Sequencer	-	✓	–	–	–	✓	–	–	
31	SPI (CSI) Communication	Transmission	✓	✓	✓	✓	✓	✓	✓	
		Reception	✓	✓	✓	✓	✓	✓	✓	
		Transmission/reception	✓	✓	✓	✓	✓	✓	✓	
32	Square Wave Output	-	✓	✓	✓	✓	✓	✓	✓	
33	Three-phase PWM Output	Reset Synchronous PWM Mode	–	✓	–	✓	–	✓	✓	
		Complementary PWM Mode	–	✓	–	✓	–	✓	✓	
		Extended Complementary PWM Mode	–	✓	–	✓	–	✓	✓	
34	UART Communication	Transmission	✓	✓	✓	✓	✓	✓	✓	
		Reception	✓	✓	✓	✓	✓	✓	✓	
		Transmission/reception	✓	✓	✓	✓	✓	✓	✓	
35	Voltage Detector	-	✓	✓	–	✓	✓	–	✓	
36	Watchdog Timer	-	✓	✓	✓	✓	✓	✓	✓	
37	Logic & Event Link Controller	-	✓	–	–	–	–	–	–	Need download in Smart Configurator RL78
38	Phase Counting Mode	-	–	–	–	–	–	–	✓	
39	Programmable Gain Amplifier	-	–	–	–	–	–	–	✓	
40	Flexible Application Accelerator	-	–	–	–	–	–	–	✓	

2.3 New support

2.3.1 Support RL78/G24 new components and modes

Support new components and modes about A/D Converter (Advanced mode), Digital Addressable Lighting Interface (DALI), 16-bit Timers KB30, KB31, and KB32 and Timer RD2. Please see Table 2-3 Support Components (1/2) ✓: Support, -: Non-supportand Table 2-4 Support Components (2/2) ✓: Support, -: Non-supportfor details.

2.3.2 Support target board selection when creating Smart Configurator project in e2 studio

From Smart Configurator for RL78 V1.7.0, the user can select more target boards except “Custom” in project generation wizard when creating Smart Configurator project in e2 studio.

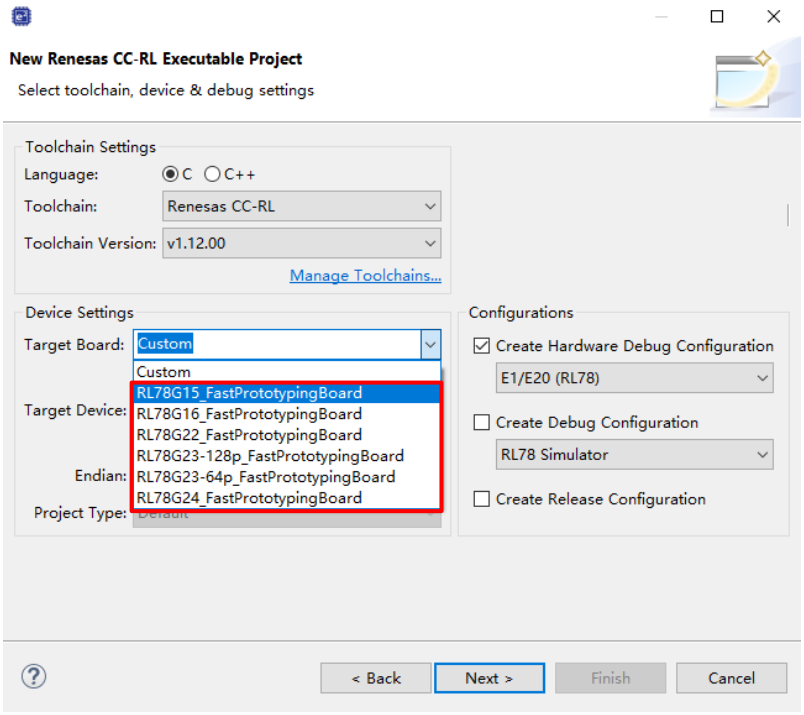


Figure 2-1 Support target board selection

2.3.3 Support blinky project generation

From Smart Configurator for RL78 V1.7.0, blinky project generation feature is supported. When the user selects target board file other than Custom in project generation wizard, Bare Metal - Blinky project template will be available and can be selected. After the user selected Bare Metal – Blinky project template, the generated project will implement blink LED resource for the selected target board.

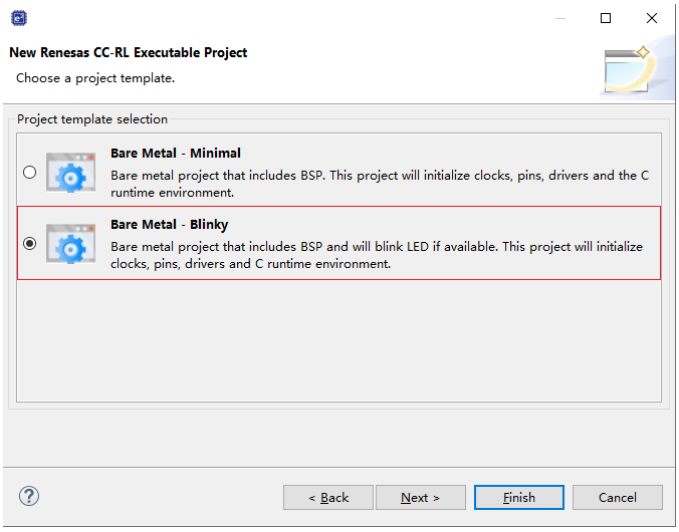


Figure 2-2 Bare Metal - Blinky project template selection

2.3.4 Support compare view for the user to resolve code confliction

If the merge conflict occurs, conflict message in red will be displayed in the Smart Configurator console, as shown in **Error! Reference source not found.**Figure 2-3 The conflict message and file compare view. The user can click the conflicted file in the console message to open the File Compare view as shown in Figure 2-3 The conflict message and file compare view and then can resolve the conflict.

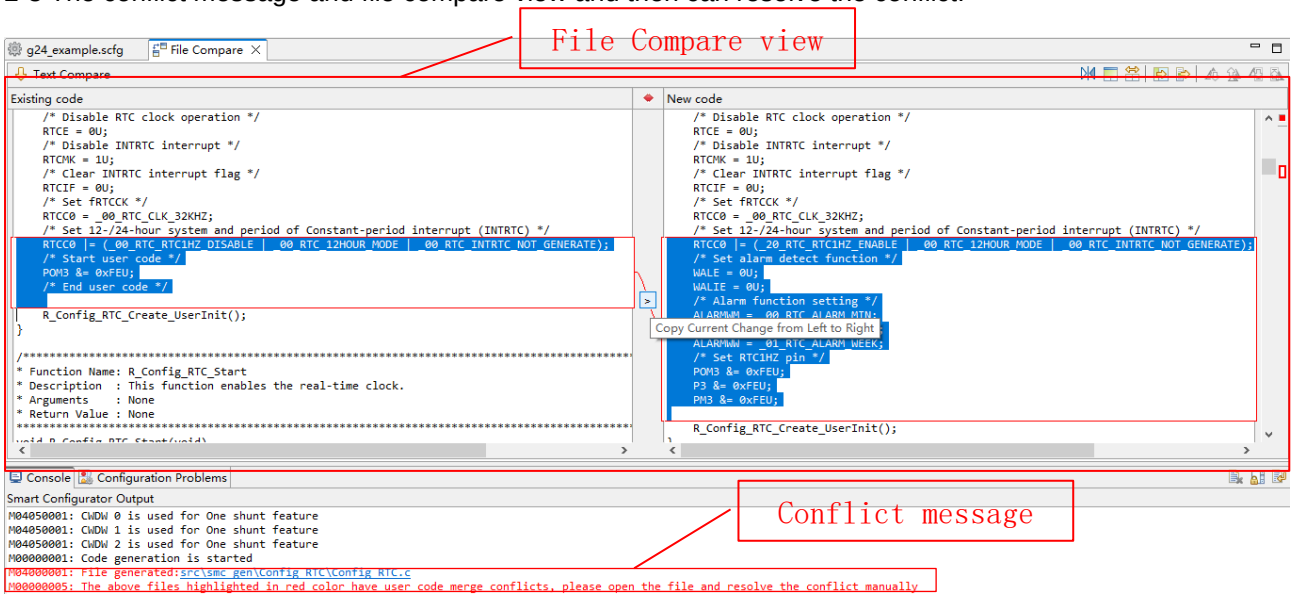


Figure 2-3 The conflict message and file compare view

There are two methods to resolve the conflict:
1) Click button “Copy Current Change from Left to Right” and then delete unused code to resolve conflict.
2) Resolve the conflict manually by copying the code in the left panel to the right panel or editing the code in the right panel directly.

Note: After confliction resolved, if click the conflict message, it still opens compare view.

2.3.5 Support symbolic name in Pin configuration

From Smart Configurator for RL78 V1.7.0, new feature to define symbolic name is supported in [Pin number] view. By defining the user's own symbol for multiplex pin, user can maintain same software even if the MCU is changed. The symbolic name can be migrated when changing device only on condition that the pin with symbolic name is assigned. The symbolic name macro is generated in file pin.h when generating code.

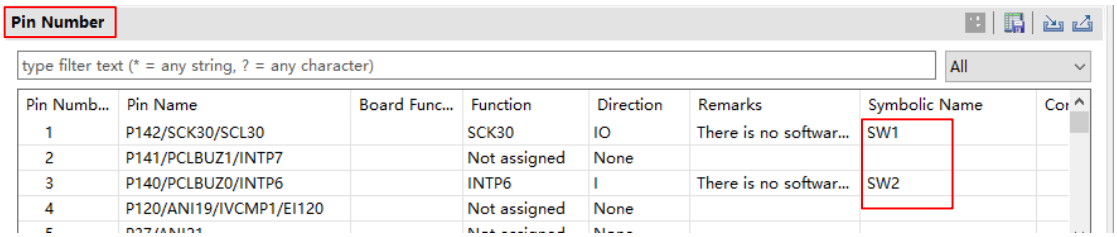


Figure 2-4 Symbolic name setting

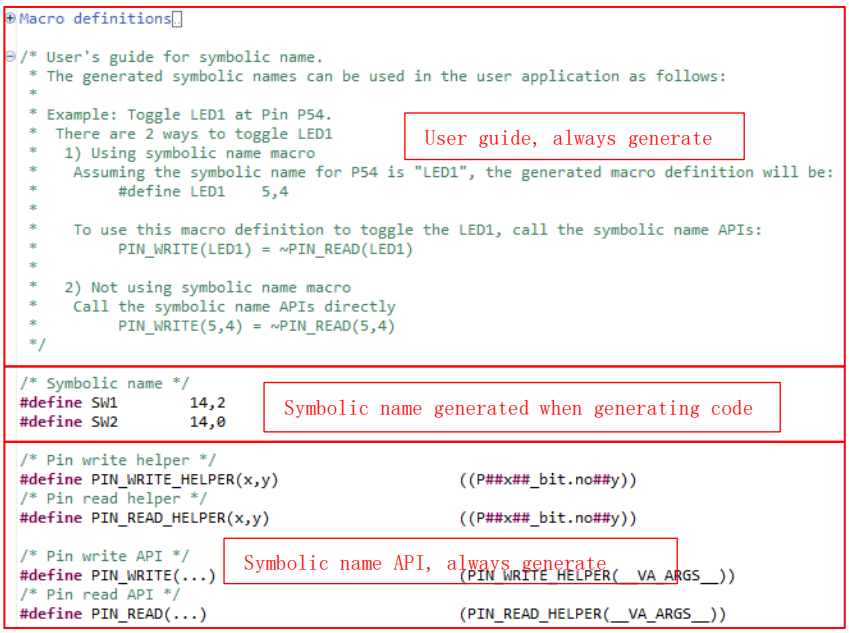


Figure 2-5 Code in pin.h

3. Changes

This chapter describes changes to the Smart Configurator for RL78 V1.7.0.

3.1 Correction of issues/limitations

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

No	Description	RL78/G23	RL78/F24	RL78/G15	RL78/F23	RL78/G22	RL78/G16	RL78/G24	Remarks
1	Fixed the issue of build warning about security option byte in CC-RL V1.12	–	✓	–	✓	–	–	–	

3.1.1 Fixed the issue of build warning about security option byte in CC-RL V1.12

In CS+, when the CC-RL compiler version is V1.12, there is a build warning W0561520 about security option byte. This issue has been fixed from Smart Configurator for RL78 V1.7.0.

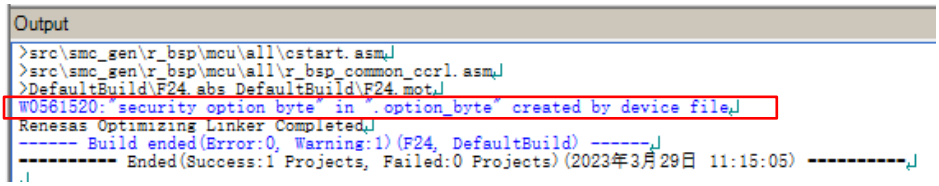


Figure 3-1 CC-RL V1.12 build warning

[On-chip debug and flash serial programming security ID reading setting] is added on System page. After generating code, the property of CC-RL (Build tool) will change according to the user's setting. When "Unuse" is selected, "Security option byte value" is FA. When "Use" is selected, "Security option byte value" is FE.

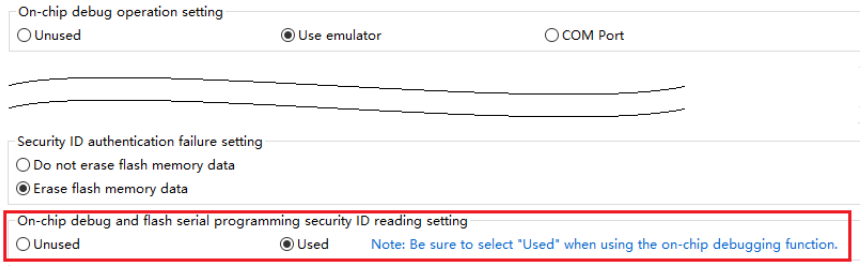


Figure 3-2 On-chip debug and flash serial programming security ID reading setting

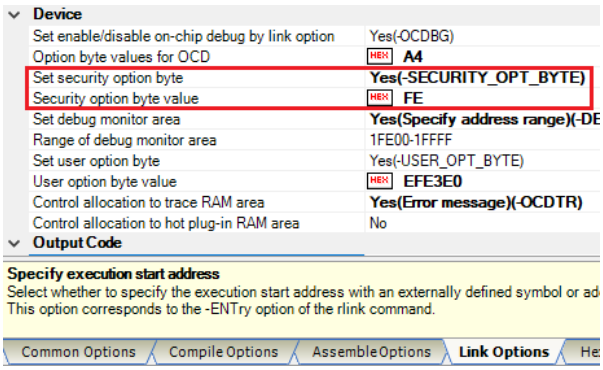


Figure 3-3 Set CS+ property about security option byte

3.2 Specification changes

Table 3-2 List of Specification changes ✓: Applicable, -: Not Applicable

No	Description	RL78/G23	RL78/F24	RL78/G15	RL78/F23	RL78/G22	RL78/G16	RL78/G24	Remarks
1	Improvement for adding the user code area at the end of the interrupt function of input capture function	–	✓	–	✓	–	–	✓	
2	Improvement for Internal reference voltage can be used when VDD ≥ 2.4V in Comparator	–	–	✓	–	–	✓	–	
3	mprovement for Internal reference voltage can be used when VDD ≥ 2.4V in A/D converter	–	–	✓	–	–	✓	–	
4	Improvement for adding PMC setting for INTP and TAU pins' setting	–	–	–	–	–	✓	–	
5	Improvement for the specification according to RL78G16 UM from V0.9 to V1.0	–	–	–	–	–	✓	–	
6	Improvement for the specification according to RL78G24 UM from V0.8 to V1.0	–	–	–	–	–	–	✓	
7	Improvement for adding include path to build setting by default after code generation	✓	✓	✓	✓	✓	✓	✓	

3.2.1 Improvement for adding the user code area at the end of the interrupt function of input capture function

When using the input capture function of timer (the function to measure the input signal), in most cases, the user adds the code to set the flag to know the capture completion. So, Smart Configurator adds the user code area in the interrupt function. The following is an example by using TRG input capture function.

```
void r_TRG_input_interrupt(void)
{
    uint8_t trgier_temp = TRGIER0;
    uint32_t temp;

    TRGIER0 = 0x00U;

    if ((TRGSR0 & _08_TRG_FLAG_OVERFLOW_SET) == _08_TRG_FLAG_OVERFLOW_SET)
    {
        TRGSR0 &= (uint8_t)~_08_TRG_FLAG_OVERFLOW_SET;
        g_tmrg_overflow_count_a += 1UL;
        g_tmrg_overflow_count_b += 1UL;
    }
    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

    if ((TRGSR0 & _02_TRG_FLAG_CAPTURE_COMPARE_B_SET) == _02_TRG_FLAG_CAPTURE_COMPARE_B_SET)
    {
        TRGSR0 &= (uint8_t)~_02_TRG_FLAG_CAPTURE_COMPARE_B_SET;

        if (0UL == g_tmrg_overflow_count_b)
        {
            temp = g_tmrg_old_value_b;
            g_tmrg_active_width_b = (uint32_t)(TRGGRB - temp);
        }
        else
        {
            temp = 0x10000UL * g_tmrg_overflow_count_b;
            g_tmrg_overflow_count_b = 0UL;
            temp = temp - g_tmrg_old_value_b;
            g_tmrg_active_width_b = (uint32_t)(temp + TRGGRB);
        }

        g_tmrg_inactive_width_b = 0UL;
        g_tmrg_old_value_b = (uint32_t)TRGGRB;
    }

    TRGIER0 = trgier_temp;
    /* Start user code for r_TRG_input_interrupt. Do not edit comment generated here */
    /* End user code. Do not edit comment generated here */
}
```

Figure 3-4 Add the user code area

3.2.2 Improvement for Internal reference voltage can be used when VDD ≥ 2.4V in Comparator

When VDD ≥ 2.4 V which includes 2.4 V ≤ VDD ≤ 5.5 V, 2.7 V ≤ VDD ≤ 5.5 V, 4.0 V ≤ VDD ≤ 5.5 V, Internal reference voltage can be selected as reference voltage.

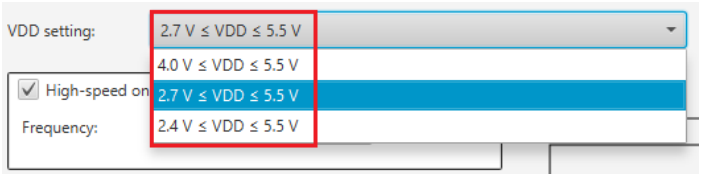


Figure 3-5 VDD setting on [Clocks] page

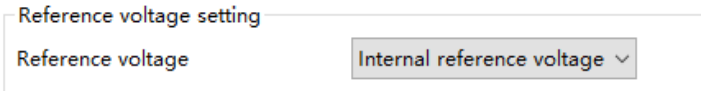


Figure 3-6 Internal reference voltage can be selected

3.2.3 Improvement for Internal reference voltage can be used when VDD ≥ 2.4V in A/D converter

When VDD ≥ 2.4 V which includes 2.4 V ≤ VDD ≤ 5.5 V, 2.7 V ≤ VDD ≤ 5.5 V, 4.0 V ≤ VDD ≤ 5.5 V, Internal reference voltage can be selected as A/D channel selection.

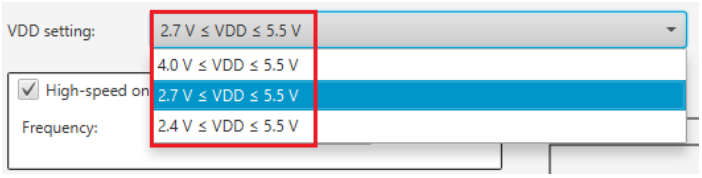


Figure 3-7 VDD setting on [Clocks] page

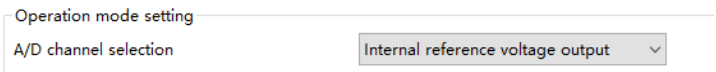


Figure 3-8 Internal reference voltage can be selected

Note: CTSU TSCAP voltage, Temperature sensor output voltage should have same spec as Internal reference voltage output in RL78/G16.

3.2.4 Improvement for adding PMC setting for INTP and TAU pins' setting

When using INTP5(P01), INTP7(P21), INTP7(P02) or TO00(P21) pin, the related PMC should be set 0. Smart Configurator adds related PMC setting code in API R_{*Configuration Name*}_Create().

3.2.5 Improvement for the specification according to RL78G16 UM from V0.9 to V1.0

Improved the specification according to RL78G16 User's Manual Hardware V1.0. Please refer to chapter "REVISION HISTORY" in User's Manual Hardware for detail.

3.2.6 Improvement for the specification according to RL78G24 UM from V0.8 to V1.0

Improved the specification according to RL78G24 User's Manual Hardware V1.0. Please refer to chapter "REVISION HISTORY" in User's Manual Hardware for detail.

3.2.7 Improvement for adding include path to build setting by default after code generation

From Smart Configurator for RL78 V1.7.0, Smart Configurator can add include path "${workspace_loc:/${ProjName}/src/smc_gen}" in default project e2 studio. If the user changes the code generation path, Smart Configurator can add new include path and remove old include path into build setting by default after code generation.

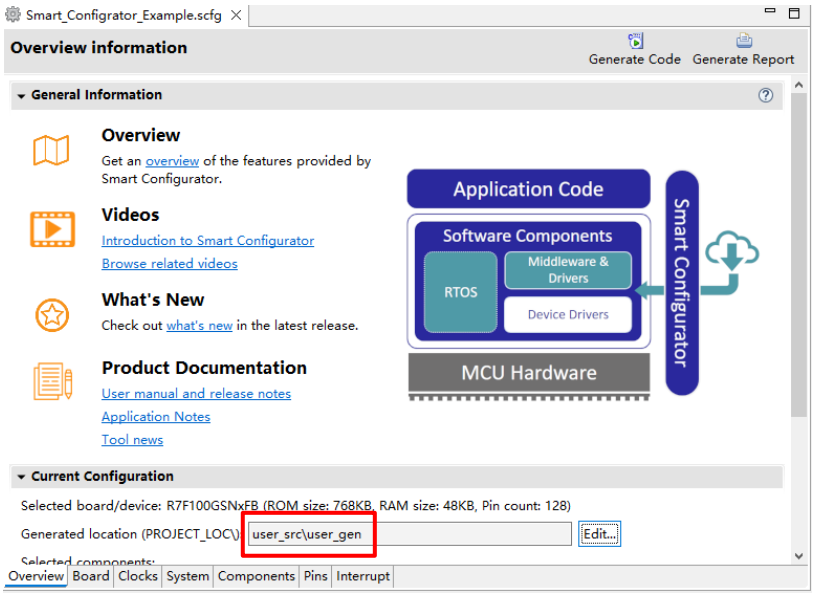


Figure 3-9 The user changes code generation path

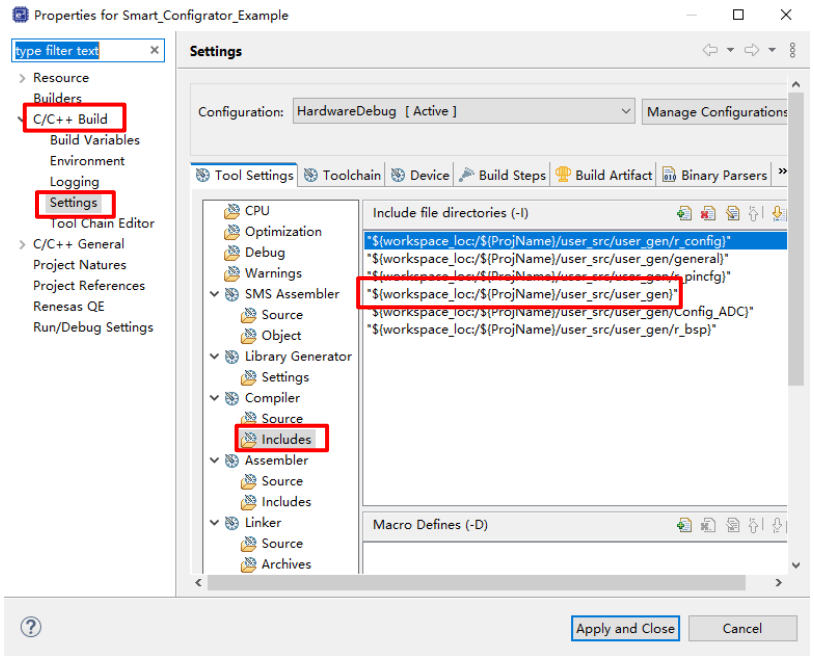


Figure 3-10 Add include path after code generation automatically

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
Oct. 01, 2021	R20TS0757	1. Notes on creating LLVM for Renesas RL78 C/C++ Executable Project 2. Notes on using Port Input buffer function https://www.renesas.com/document/tnn/notes-e-studio-smart-configurator-plug-smart-configurator-rl78	RL78/G23	V1.2.0
Mar. 16, 2022	R20TS0822	1. Notes when build or clean e2 studio Smart Configurator project https://www.renesas.com/document/tnn/notes-e-studio-smart-configurator-plug-smart-configurator-rl78-0	RL78/G23	V1.3.0
Dec. 01, 2022	R20TS0895	1. Notes when changing version of Board Support Program (BSP) or RL78 Software Integration System (SIS) modules https://www.renesas.com/us/en/document/tnn/notes-e-studio-smart-configurator-rl78-plug-smart-configurator-rl78	RL78/G23 RL78/F24 RL78/G15	V1.5.0

5. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RL78 V1.7.0.

5.1 List of Limitation

Table 5-1 List of Limitation ✓: Applicable, -: Not Applicable

No	Description	RL78/G23	RL78/F24	RL78/G15	RL78/F23	RL78/G22	RL78/G16	RL78/G24	Remarks
1	Note on extra help document issue	✓	✓	✓	✓	✓	✓	✓	
2	Note on ELCL D flip flop component GUI warning display incorrectly	✓	–	–	–	–	–	–	
3	Note on the unsupported setting items for some ELCL components	✓	–	–	–	–	–	–	
4	Note on the extra “Run” menu on toolbar	✓	✓	✓	✓	✓	✓	✓	
5	Note on clock mode setting error in IICA	–	–	–	–	–	–	✓	

5.2 Details of Limitation

5.2.1 Note on extra help document issue

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

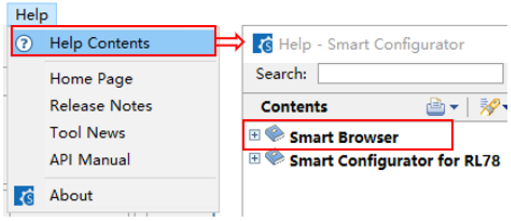


Figure 5-1 Extra help issue

5.2.2 Note on ELCL D flip flop component GUI warning display incorrectly

When selecting the event signal in ELCL D flip flop component, even if the selected signal consists with the hardware specification, there still displays the warning on the GUI.

[Avoidance measure]
Make reference to the hardware manual and set the selectable event signal though warning appeared in GUI, the waring is no impact for the code generation.

The following is example of using flip-flop 0 and flip-flop 1 in ELCL logic cell block L1.

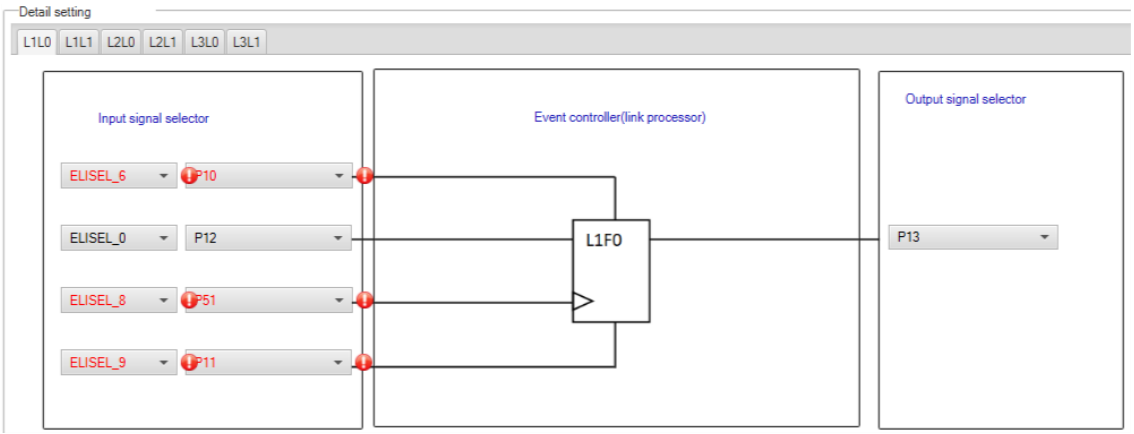


Figure 5-2 The flip-flop 0 in ELCL logic cell block L1 usage example

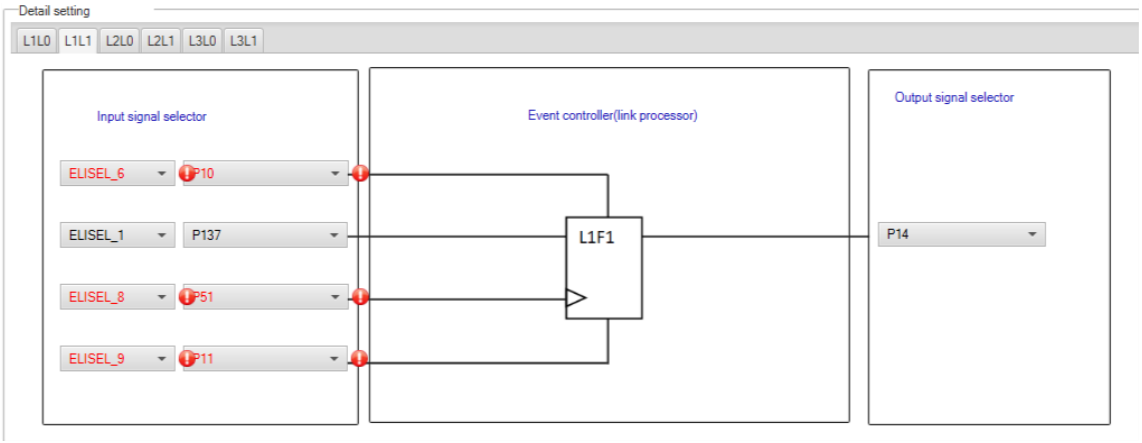


Figure 5-3 The flip-flop 1 in ELCL logic cell block L1 usage example

5.2.3 Note on the unsupported setting items for some ELCL components

In the following ELCL modules, it is not possible to set "no selection (fixed to 0)" as the input signal of the logic cell block and "negative logic output (inverted)" as the output level of the event signal.

- ELCL AND
- ELCL D flip flop
- ELCL EXOR
- ELCL selector
- ELCL Through

[Avoidance measure] None

5.2.4 Note on the extra “Run” menu on toolbar

After launching Smart Configurator, an extra menu “Run” will appear on the toolbar if user has launched the Smart Configurator for RL78 V1.6.0 or earlier version. Please ignore this menu.

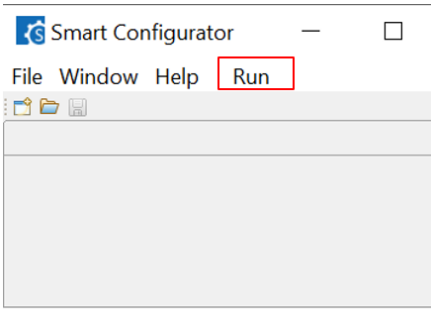
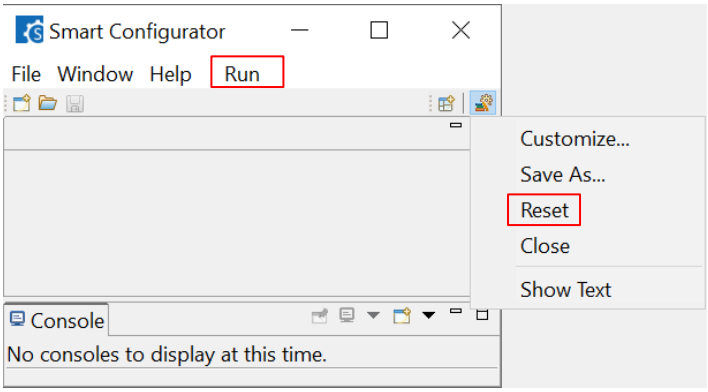


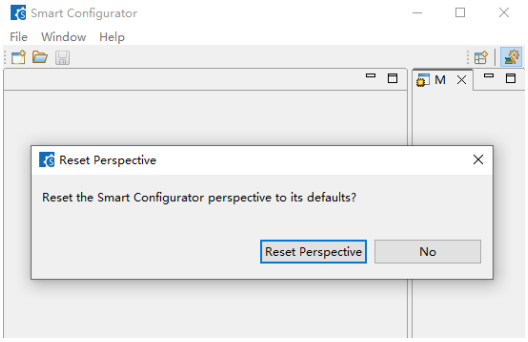
Figure 5-4 Menu “Run” on the toolbar

To remove it, user can reset the perspective according to below steps:

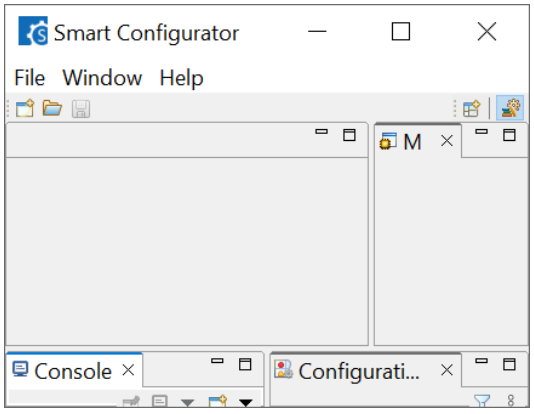
1) Right-click Smart Configurator icon, select “Reset”.



2) Select “Reset Perspective”.



Menu “Run” is removed.



5.2.5 Note on clock mode setting error in IICA

When user selects fCLK as 48MHz in [Clock] page, if user selects fCLK/2 as IICA operation clock, there are a “!” on GUI.

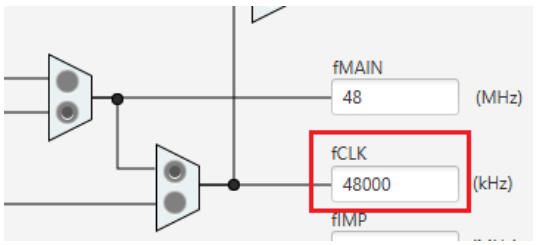


Figure 5-5 fCLK setting in [Clock] page

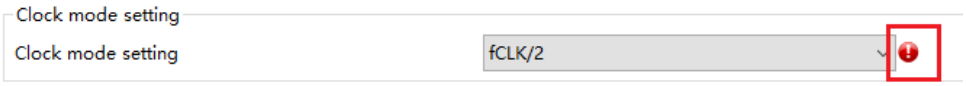


Figure 5-6 IICA operation clock error when selecting fCLK/2

[Avoidance measure]
The generation code is correct, so please ignore this error message.

6. Points for Caution

This section describes points for caution regarding the Smart Configurator for RL78 V1.7.0.

6.1 List of Caution

Table 6-1 List of Caution **✓: Applicable, -: Not Applicable**

No	Description	RL78/G23	RL78/F24	RL78/G15	RL78/F23	RL78/G22	RL78/G16	RL78/G24	Remarks
1	Note on the build error message such as “section .bss virtual address range overlaps with .dtc_vectortable”	✓	✓	–	✓	✓	–	✓	
2	Note on the installation of the Smart Configurator	✓	✓	✓	✓	✓	✓	✓	
3	Note on using TRDIOA0 for Input capture and TRDIOB0 for Output compare at same time	–	✓	–	–	–	–	✓	
4	Note on pulse width calculation of Timer RD input capture function	–	✓	–	–	–	–	✓	
5	Note on using Touch middleware and UART communication components	✓	–	–	–	–	–	–	
6	Note on the include path update issue when renaming the component’s configuration name	✓	✓	✓	✓	✓	✓	✓	
7	Note on TAU Input Signal High/Low level Measurement components.	✓	✓	✓	✓	✓	✓	✓	
8	Note on C++ project of CC-RL V1.12	✓	✓	✓	✓	✓	✓	✓	
9	Note on browsing “Release Notes” and “Tool News” URL from the help menu	✓	✓	✓	–	–	–	–	
10	Note on using user code protection feature	✓	✓	✓	✓	✓	✓	✓	
11	Note on IAR build error when using SMS function	✓	–	–	–	–	–	–	
12	Note on A/D conversion time setting after performing [Change device] or [Change resource]	✓	✓	✓	✓	✓	✓	✓	
13	Note on changing Hardware Debug Configuration on project generation wizard	✓	✓	✓	✓	✓	✓	✓	
14	Note on FAA Configurator component does not support LLVM project	–	–	–	–	–	–	✓	

6.2 Details of Caution

6.2.1 Note on the build error message such as “section .bss virtual address range overlaps with .dtc_vectortable”

When user use many components and DTC component together, the generated code build might fail due to some section address overlaps.

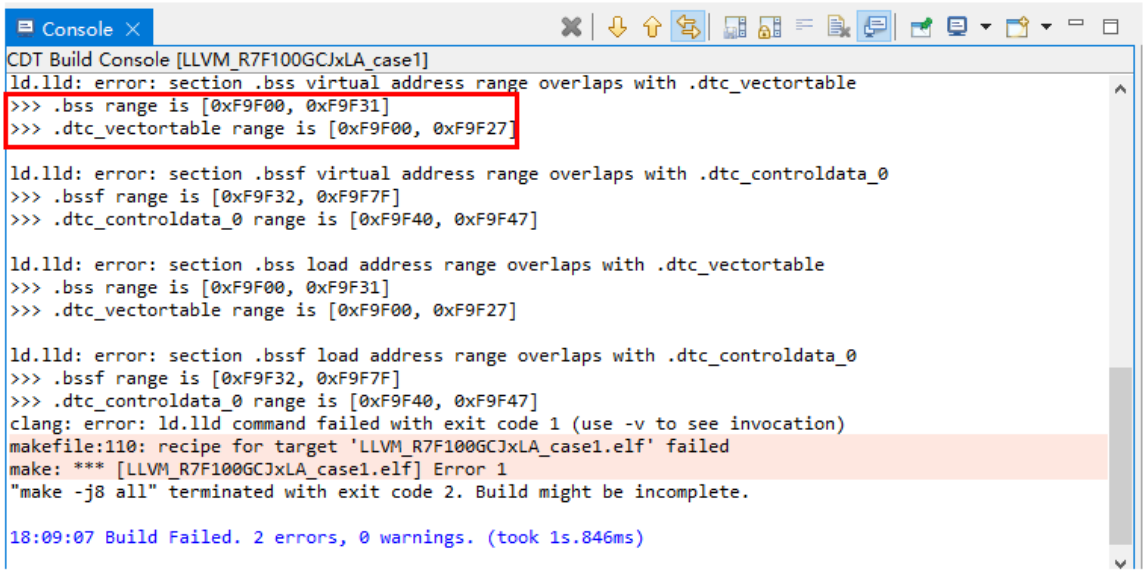


Figure 6-1 Build error message

[Workaround]
The Smart Configurator cannot set “.bss” and “.bssf” section address. So user should consider to modify “.bss” and “.bssf” section address manually in “linker_script.ld” file or change the DTC base address to avoid such section overlap error.

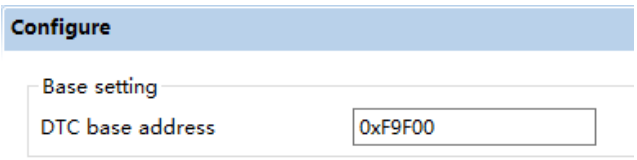


Figure 6-2 DTC base address setting

6.2.2 Note on the installation of the Smart Configurator

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

6.2.3 Note on using TRDIOA0 for Input capture and TRDIOB0 for Output compare at same time

If user sets up TRDIOA0 for Input capture and TRDIOB0 for Output compare at the same time. Smart Configurator will output a Peripheral conflict error.
User can ignore this Smart Configurator error message and use these two functions at the same time.

6.2.4 Note on pulse width calculation of Timer RD input capture function

The pulse width calculation code is with the assumption that the counter is not cleared between two interrupts occurrence, except the input pulse width which is selected as counter clear trigger on GUI.
For example, when “Clear by TRDGRAn input capture” is selected, only TRDIOAn pulse width calculation handle counter clear, other input pulse width calculation doesn’t handle counter clear.

Figure 6-3 Counter clear setting in Input capture function

6.2.5 Note on using Touch middleware and UART communication components

When use Touch middleware, please do not change the name of UART components. Otherwise, due the file name mismatch will bring build error.
For example, in touch middleware select UART0 as UART channel, for UART0 component please use Config_UART0.

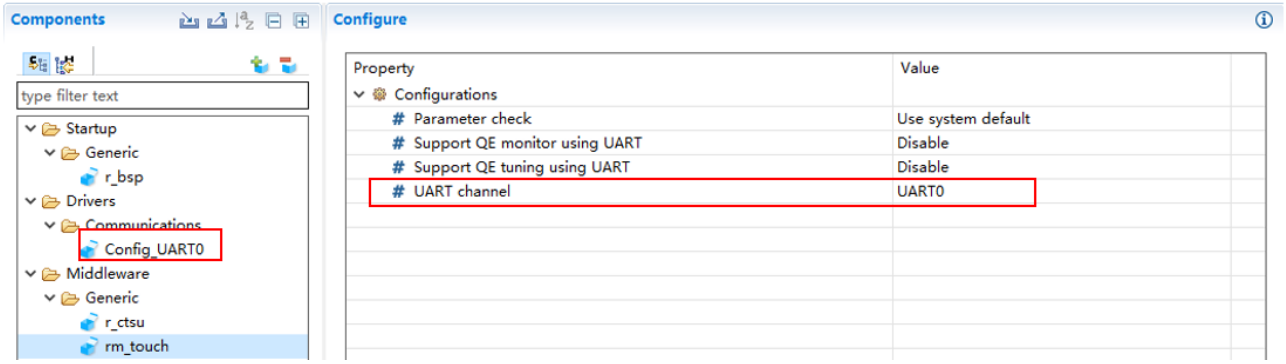


Figure 6-4 Touch middleware and UART communication components

6.2.6 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.

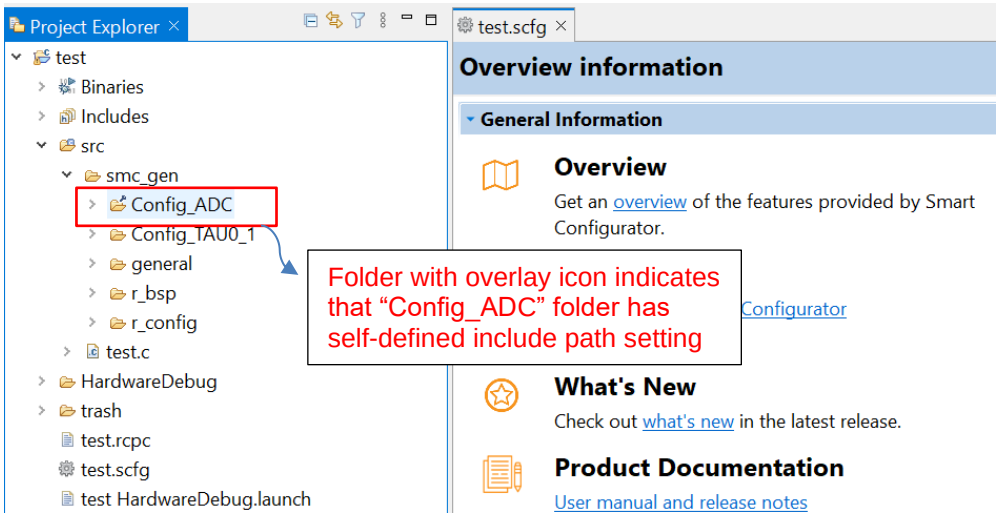


Figure 6-5 Interval Timer component configuration before renaming

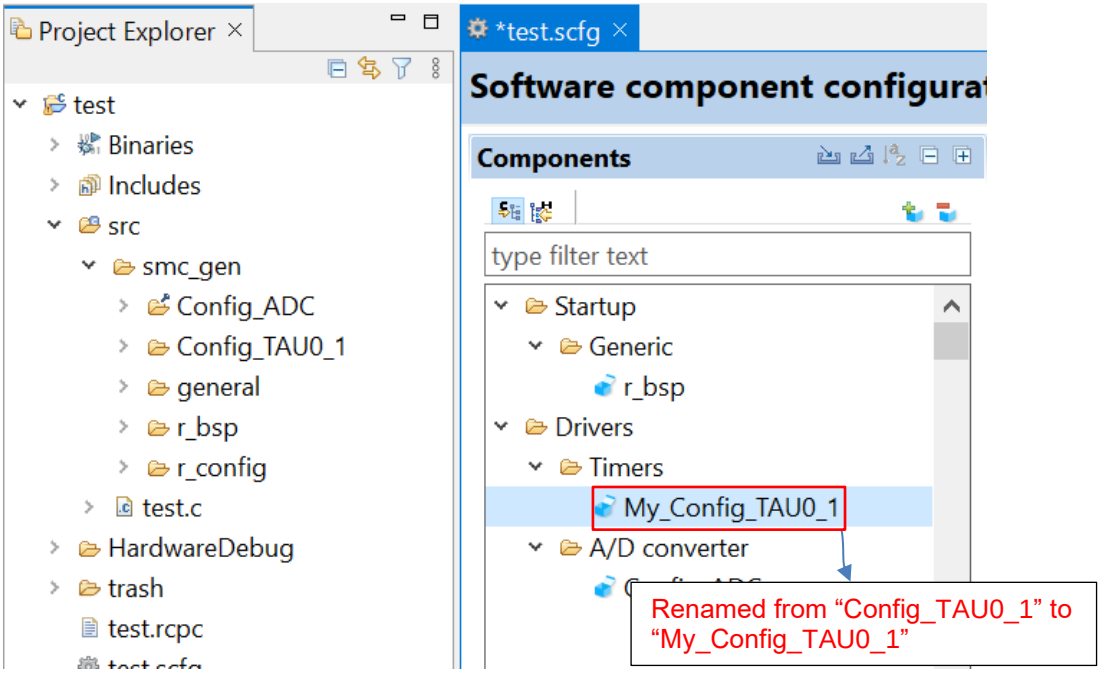


Figure 6-6 The Interval Timer component configuration after renaming

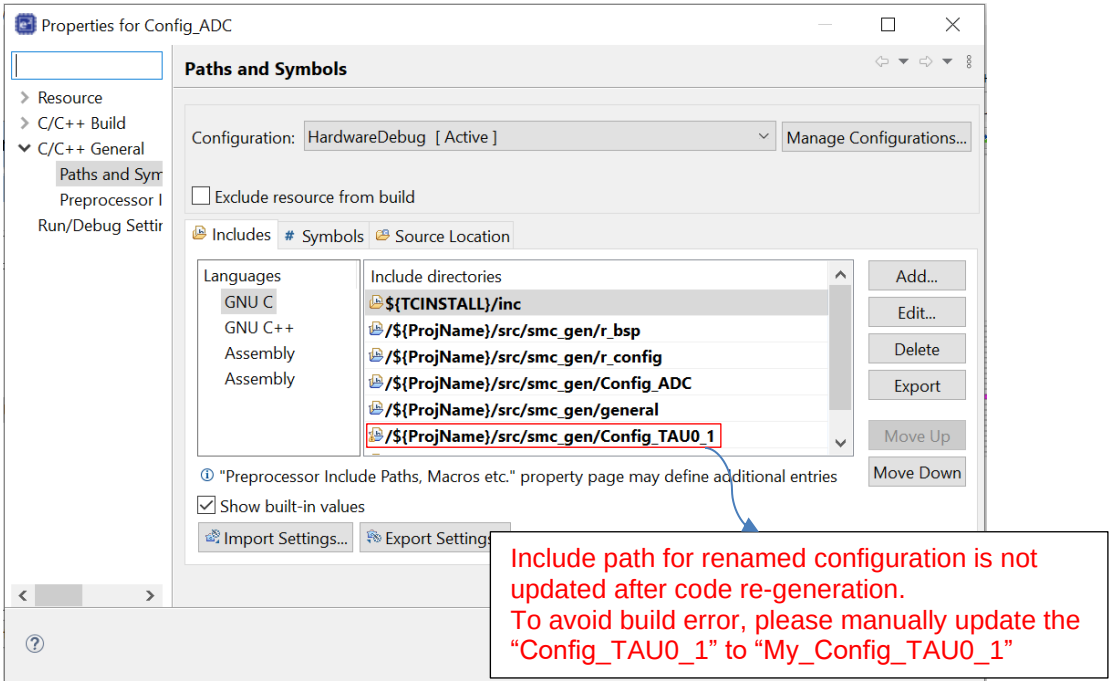


Figure 6-7 Include path setting for the “Config_ADC” configuration

6.2.7 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.

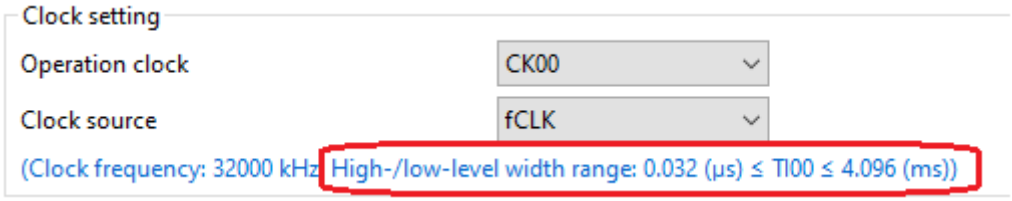


Figure 6-8 High/Low level width min value

6.2.8 Note on CC-RL V1.12 C++ project

In CC-RL V1.12 C++ project, there are some dummy issues such as “EI()” in editor. However this is editor specification and does not affect the program operation. Please ignore it.

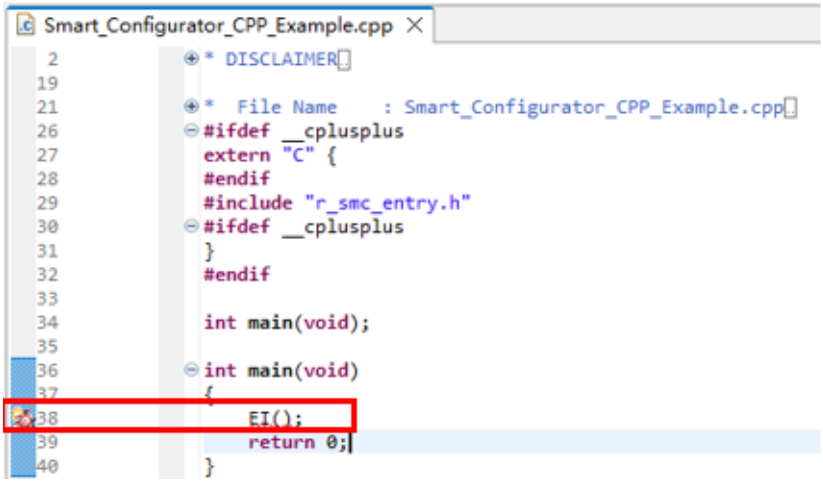


Figure 6-9 CODAN issue in CC-RL V1.12 C++ project

6.2.9 Note on browsing “Release Notes” and “Tool News” URL from the help menu

For Smart Configurator for RL78 V1.4.0 or before version, “Release Notes” and “Tools News” in the help menu cannot access the correct URL. This issue has been fixed from this version.
Please access the URL below directly for Smart Configurator for RL78 V1.4.0 or before version.
Release Notes: https://www.renesas.com/rl78-smart-configurator-release-note
Tool News: https://www.renesas.com/rl78-smart-configurator-tn-notes

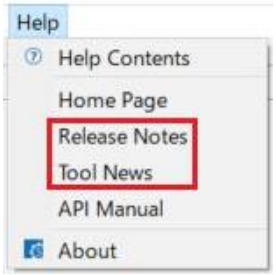


Figure 6-10 Release Notes and Tool News in Smart Configurators

6.2.10 Note on using user code protection feature

From Smart Configurator for RL78 V1.5.0 onwards, 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 */
```

The user code protection feature will only be supported on the files that are generated by the Code Generation component. Hence, the user code protection feature is not available for non-Code Generation components.

6.2.11 Note on IAR build error when using SMS component

When using SMS component, if the following build error is met in IAR Embedded workbench, please check the build order setting in project [Options…] -> [Custom Build] page.

1) When using IAR Embedded workbench V5.10, select "Run before compiling/assembling" (refer to Figure 6-12)
2) When using IAR Embedded workbench V4.21, make “Run this tool before all other tools” checked (refer to Figure 6-13)

The above setting can eliminate this build error.

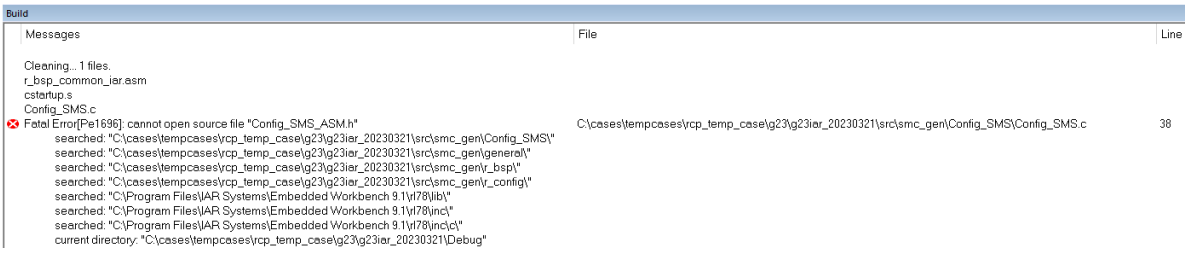


Figure 6-11 IAR build error

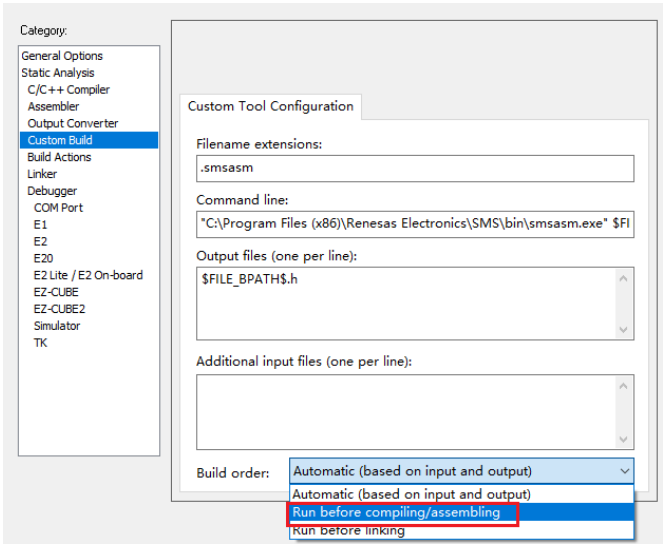


Figure 6-12 "Build order" setting of IAR Embedded workbench V5.10

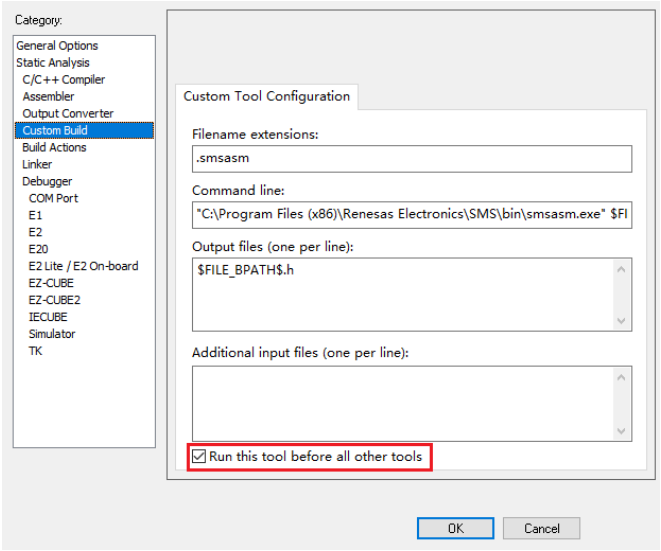


Figure 6-13 Custom build setting of IAR Embedded workbench V4.21

6.2.12 Note on A/D conversion time setting after performing [Change device] or [Change resource]

After performing [Change device] (for example, change from RL78/G23 to RL78/G24), the A/D conversion time setting can't be kept. The user should take note to reconfirm the conversion time setting as he wants.

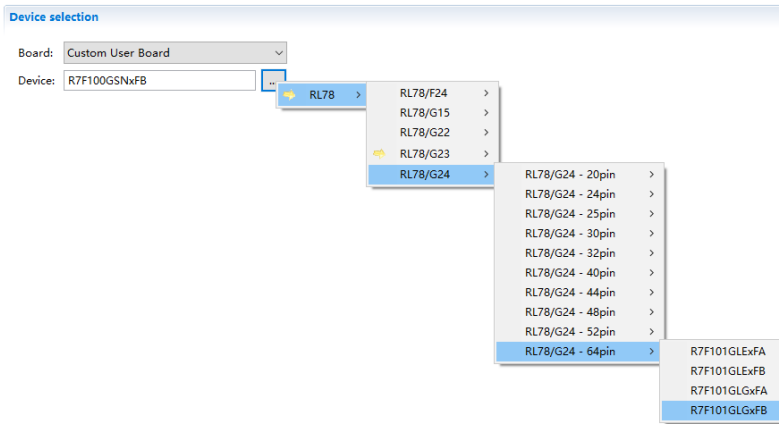


Figure 6-14 [Change device] operation

Figure 6-15 A/D conversion time setting

When changing resource, for example from RL78/G24 normal A/D and RL78/G24 advanced A/D, the A/D conversion time can't be kept.

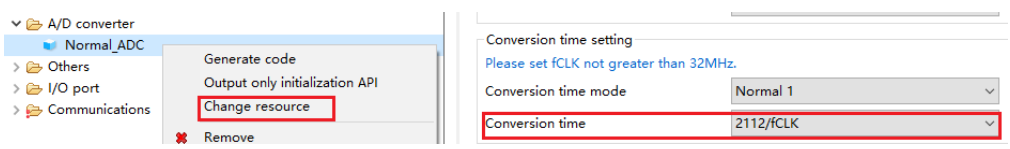


Figure 6-16 [Change resource] operation

6.2.13 Note on changing Hardware Debug Configuration on project generation wizard

When a target board (except custom) is selected during creating a new project, please don't change the Hardware Debug Configuration manually. The reason is that the Hardware Debug Configuration has be decided by target board automatically. The user setting can't be reflected into Smart Configurator.

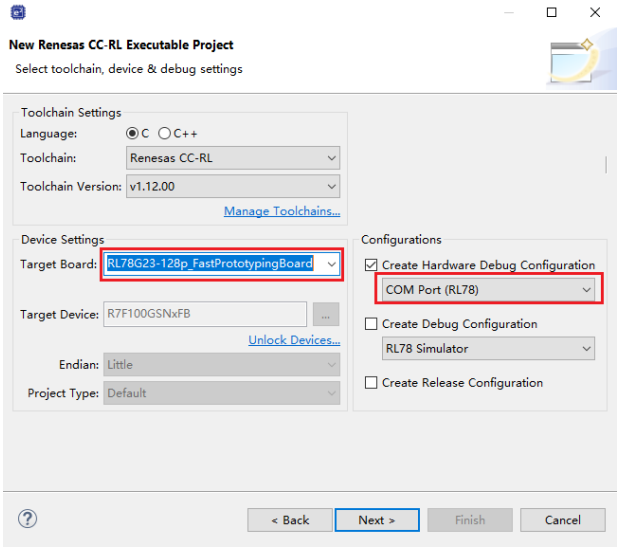


Figure 6-17 Select a target board when creating a project in e2 studio

6.2.14 Note on FAA Configurator component does not support LLVM project

In Smart Configurator for RL78 V1.7.0, FAA Configurator component was not supported for LLVM project. Though the user can add FAA Configurator component under LLVM project, but the generated FAA source code can't be built successfully and works for running and debugging.

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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