Smart Configurator for RH850 V1.4.0

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.

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.

1.1 System requirements

The operating environment is as follows.

1.1.1 PC

- IBM PC/AT compatibles (Windows® 10, Windows® 8.1)
- Processor: 1 GHz or higher (must support hyper-threading, multi-core CPUs)
- Memory capacity: 2 GB or more recommended. Minimum requirement is 1 GB or more (64-bit Windows requires 2 GB or more)
- Hard disk capacity: 200 MB or more spare capacity
- Display: 1024 x 768 or higher resolution, 65,536 or more colors
- All other necessary software environments in addition to Windows OS: Java Runtime Environment

1.1.2 Development Environments

- Renesas electronics Compiler for RH850 [CC-RH] V2.03.00 or later
- GHS Multi V7.1.6 or later
- IAR Embedded Workbench for RH850 V2.21 or later

2. Support List

2.1 Support Devices List

Below is a list of devices supported by the Smart Configurator for RH850 V1.4.0.

Table 2-1 Support Devices

Group (HW Manual number)	PIN	Device name (Device file version)
RH850/F1KM-S1 Group (R01UH0684JJ0100)	48pin	R7F701693, R7F701694, R7F701695
	64pin	R7F701690, R7F701691, R7F701692
	80pin	R7F701687, R7F701688, R7F701689
	100pin	R7F701684, R7F701685, R7F701686
RH850/F1KM-S4 Group (R01UH0684JJ0100)	100pin	R7F701644, R7F701645
	144pin	R7F701646, R7F701647
	176pin	R7F701648, R7F701649
	232pin	R7F701650, R7F701651
RH850/U2A16 Group (R01UH0864EJ0061)	292pin	R7F702300 (V1.10)
	516pin	R7F702300 (V1.10)
RH850/U2A8 Group (R01UH0864EJ0061)	292pin	R7F702301 (V1.00)
RH850/F1KH-D8 Group (R01UH0684EJ0111)	176pin	R7F701708, R7F701709 (V1.20)
	233pin	R7F701710, R7F701711 (V1.20)
	324pin	R7F701714, R7F701715 (V1.20)

2.2 Support Components List

Below is a list of Components supported by the Smart Configurator for RH850 V1.4.0.

Table 2-2 Support Components

✓: Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850 F1KH	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	-	-	✓	-	
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	-	-	✓	-	

Table 2-3 Support Components

✓: Support, -: Non-support

No	Components	Mode	RH850F1KM	RH850U2A	RH850F1KH	Remarks
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	✓	✓	✓	
		Slave	✓	✓	✓	
30	SCI3 Asynchronous Mode	Transmission	-	✓	-	
		Reception	-	✓	-	
		Transmission / Reception	-	✓	-	
		Multi-processor Transmission	-	✓	-	
		Multi-processor Reception	-	✓	-	
		Multi-processor Transmission / Reception	-	✓	-	
31	SCI3 Clock Synchronous Mode	Transmission	-	✓	-	
		Reception	-	✓	-	
		Transmission / Reception	-	✓	-	
32	Stand-by Controller	-	✓	✓	-	Only Stop and DeepStop mode
33	Clock Divider	-	✓	✓	✓	
34	Delay Count	-	✓	✓	✓	

Table 2-4 Support Components

✓: Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850F1 KH	Remarks
35	External Event Count	-	✓	✓	✓	
36	Input Interval Timer	-	✓	✓	✓	
37	Input Period Count Detection	-	✓	✓	✓	
38	Input Position Detection	-	✓	✓	✓	
39	Input Pulse Interval Judgment	-	✓	✓	✓	
40	Input Pulse Interval Measurement	-	✓	✓	✓	
41	Input Signal Width Judgement	-	✓	✓	✓	
42	Input Signal Width Measurement	-	✓	✓	✓	
43	Interval Timer	-	✓	✓	✓	
44	One-Pulse Output	-	✓	✓	✓	
45	One-Shot Pulse output	-	✓	✓	✓	
46	Overflow Interrupt Output (Input Period Count Detection)	-	✓	✓	✓	
47	Overflow Interrupt Output (Width Measurement)	-	✓	✓	✓	
48	PWM Output	-	✓	✓	✓	
49	Triangle PWM Output	-	✓	✓	✓	
50	Triangle PWM Output with Dead Time	-	-	✓	✓	
51	UART Interface	Transmission	✓	✓	✓	
		Reception	✓	✓	✓	
		Transmission / Reception	✓	✓	✓	
52	Window Watchdog Timer	-	✓	✓	-	

2.3 New support

2.3.1 The RH850/F1KH-D8 packages are supported

From Smart Configurator for RH850 V1.4.0, RH850/F1KH-D8 packages as below are supported.

R7F701708
R7F701709
R7F701710
R7F701711
R7F701714
R7F701715

2.3.2 The functions (e.g. Operation, Resource) selected in the ‘New component’ wizard page can be displayed after creating configuration

From Smart Configurator for RH850 V1.4.0, the functions (e.g. Operation, Resource) selected in the ‘New component’ wizard can be displayed after creating configuration, the information will be shown when mouse hovers on the information configuration name; meanwhile from this version, component name can be printed into the Smart Configurator report (configuration section).

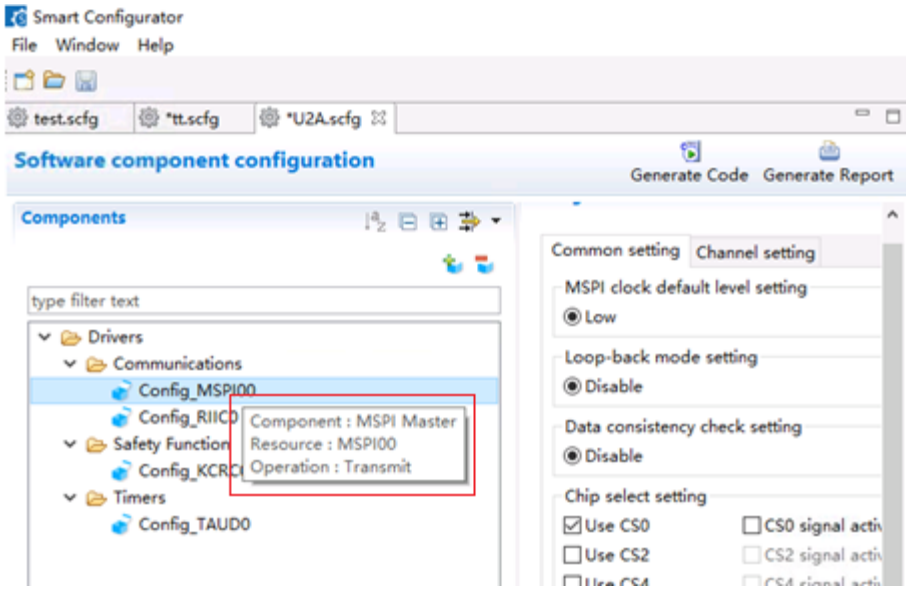
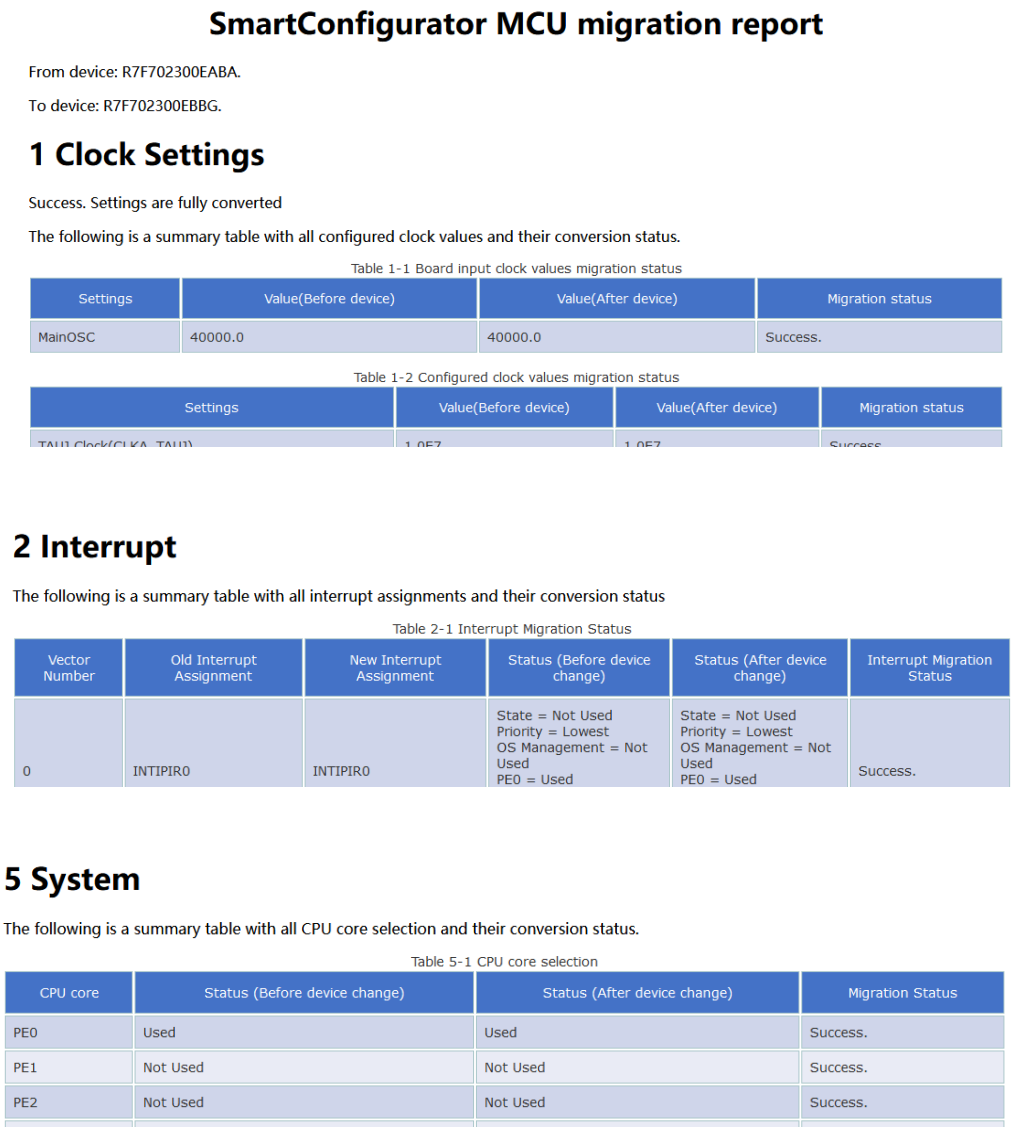


Figure 2-1. Display selected function

2.3.3 Interrupt, Clock and System information have been added into migration report after device migration is completed.

From Smart Configurator for RH850 V1.4.0, when changing device, generated migration report can include Interrupt/Clock/System information.

Note: only RH850U2A project supports System page.



SmartConfigurator MCU migration report

From device: R7F702300EABA.

To device: R7F702300EBBG.

1 Clock Settings

Success. Settings are fully converted

The following is a summary table with all configured clock values and their conversion status.

Table 1-1 Board input clock values migration status

Settings	Value(Before device)	Value(After device)	Migration status
MainOSC	40000.0	40000.0	Success.

Table 1-2 Configured clock values migration status

Settings	Value(Before device)	Value(After device)	Migration status
TAU1 Clock(CLKA_TAU1)	1.0E7	1.0E7	Success

2 Interrupt

The following is a summary table with all interrupt assignments and their conversion status

Table 2-1 Interrupt Migration Status

Vector Number	Old Interrupt Assignment	New Interrupt Assignment	Status (Before device change)	Status (After device change)	Interrupt Migration Status
0	INTIPIR0	INTIPIR0	State = Not Used Priority = Lowest OS Management = Not Used PE0 = Used	State = Not Used Priority = Lowest OS Management = Not Used PE0 = Used	Success.

5 System

The following is a summary table with all CPU core selection and their conversion status.

Table 5-1 CPU core selection

CPU core	Status (Before device change)	Status (After device change)	Migration Status
PE0	Used	Used	Success.
PE1	Not Used	Not Used	Success.
PE2	Not Used	Not Used	Success.

Figure 2-2. Migration report

2.3.4 Generated source files can be outputted to any specified folder within the Smart Configurator project

From Smart Configurator for RH850 V1.4.0, user can specify the destination folder for generated source files by the “Edit…” button on the Overview page, this folder can be any folder within the project.

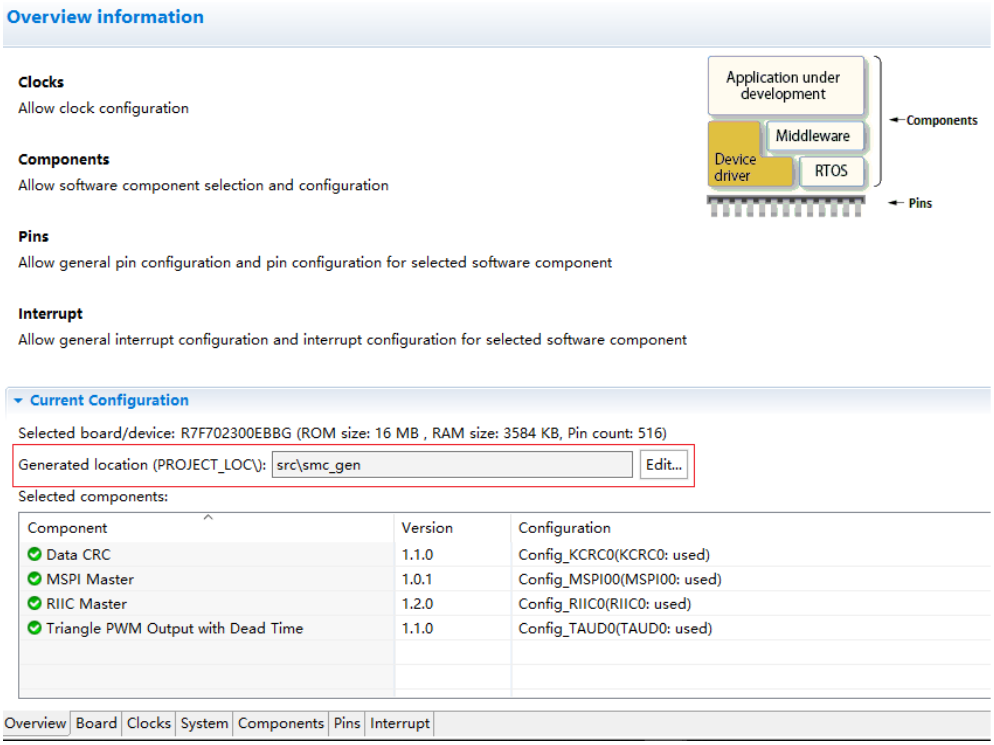


Figure 2-3. Generated files location

2.3.5 The 'Creation Date' attribute value in the code generation driver file can be turned off by Smart Configurator preference setting.

From Smart Configurator for RH850V1.4, 'Creation Date' attribute value in the code generation driver file can be turned off by Smart Configurator preference setting.

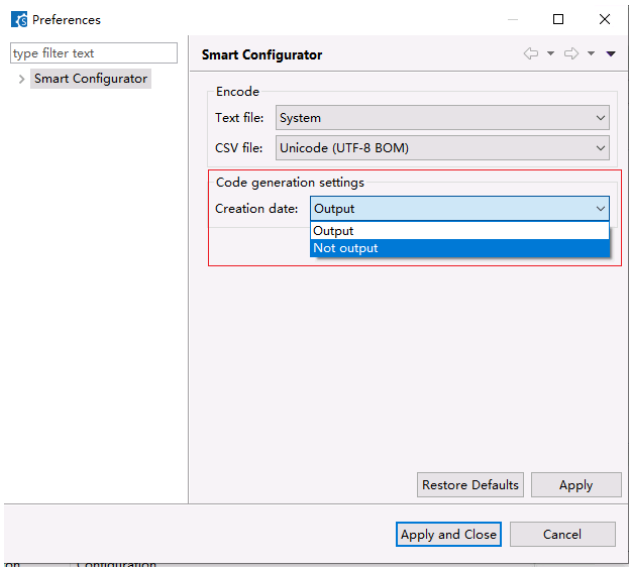


Figure 2-4. Creation date setting

2.3.6 Output only initialization API function feature is supported.

From Smart Configurator for RH850V1.4, the feature of outputting only initialization API function for Code Generator component configurations is supported via “API function output” preference setting as below:

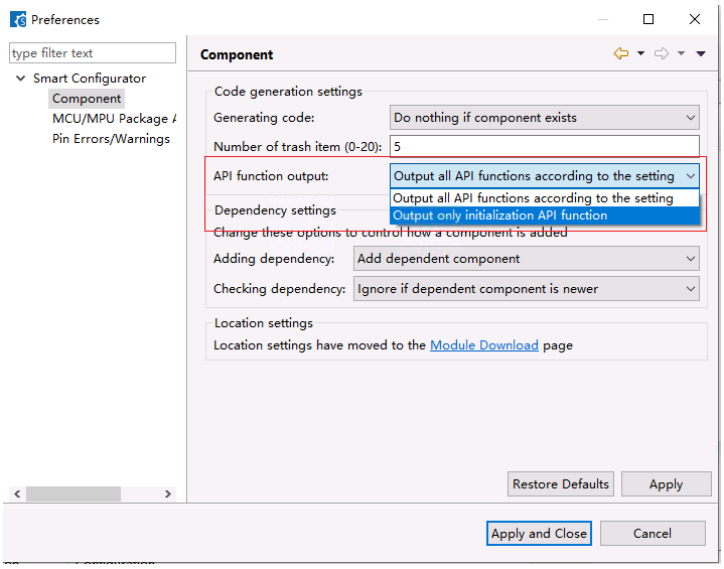


Figure 2-5. “API function output” preference setting

3. Changes

This chapter describes changes to the Smart Configurator for RH850 V1.4.0.

3.1 Correction of issues/limitations

Table 3-1 List of Correction of issues/limitations

✓: Applicable, -: Not Applicable

No	Description	RH850 F1KM	RH850 U2A	Remarks
1	Fixed baud rate max value wrong issue when using CSI Master component.	✓	-	
2	Fixed redundant Inter-data delay time and Hold time settings issue when using CSIH Resource in CSI master component.	✓	-	
3	Fixed Transfer end Callback not generated issue when using RIIC Master/Slave component.	✓	✓	
4	Fixed X2 pin not assigned issue when main clock Oscillation source is EXCLK mode.	✓	-	
5	Fixed generated code wrong issue when selecting Half delay mode for CSI Master component.	✓	-	
6	Fixed data length setting error issue when using CSIG Master and CSIG Slave component.	✓	-	
7	Fixed generated code wrong issue when specifying “High level” as CS active signal for CSIH Master component.	✓	-	
8	Fixed generated code wrong issue when specifying “16 bits” or “8 bits” as the CRC input bit width for CRC component.	✓	-	
9	Fixed generated code wrong issue for output pulse width when using One-Pulse Output and One-Shot Pulse Output components.	✓	✓	
10	Fixed generated code wrong issue for slave channel priority when using PWM Output and Triangle PWM Output components	✓	-	

3.1.1 Fixed baud rate max value wrong issue when using CSI Master component.

When setting C_ISO_CSI frequency larger than 40MHz in [Clocks] page, baud rate max value of component CSI Master is 10MHz, which is not satisfy the condition that CSI master max transfer clock frequency must equal to or lower than 10MHz. This issue has been fixed from SC for RH850 V1.4.0.

3.1.2 Fixed redundant Inter-data delay time and Hold time settings issue when using CSIH Resource in CSI master component.

When setting “1.0 transmission clock cycle” or “0.5 transmission clock cycle” as “Inter-data delay time”, or “1.0 transmission clock cycle” or “1.5 transmission clock cycle” as “Hold time” in CSIH Master component, then changing “Interrupt delay mode setting”, some duplicated items in “Inter-data delay time” and “Hold time” appear as following figure shows:

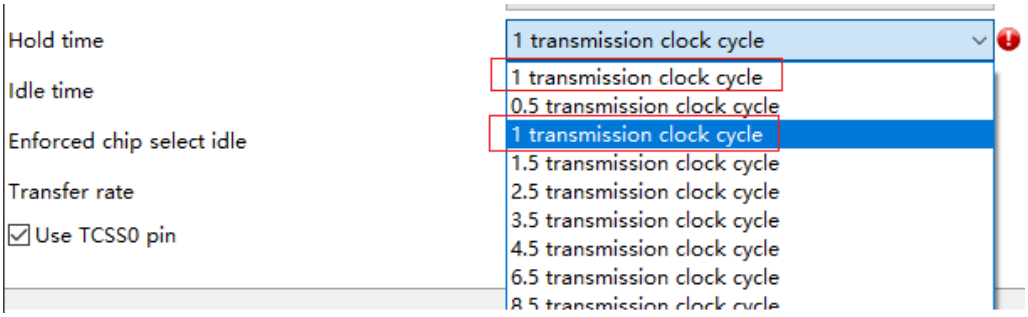


Figure 3-1. Duplicated items in “Hold time”

This issue has been fixed from RH850 V1.4.0.

3.1.3 Fixed transfer end callback not generated issue when using RIIC Master/Slave component.

When uncheck “Enable timeout interrupt (TMOI)”, “Enable arbitration-lost interrupt (ALI)”, “Enable start condition detection interrupt (STI), “Enable stop condition detection interrupt (SPI)”, ”Enable NACK reception interrupt (NAKI)”, and then check “Transfer end” in “Callback function setting” group, Transfer end callback function “r_Config_RIICn_callback_transmitend()” is not generated out. This issue has been fixed from SC for RH850 V1.4.0.

3.1.4 Fixed X2 pin not assigned issue when main clock Oscillation source is EXCLK mode.

When enabling main clock “MainOSC” and setting Oscillation source as EXCLK mode, X2 pin is not assigned in [Pin] page. This issue has been fixed from SC for RH850 V1.4.0.

3.1.5 Fixed generated code wrong issue when selecting Half delay mode for CSI Master component.

When using CSI master mode, all interrupts can’t be set up to be delayed by half cycle of the transmission clock, even if user config the interrupt delay mode as “half delay” on GUI.
Please refer to the document number R20TS0668 of RENESAS TOOL NEWS.
This issue has been fixed from SC for RH850 V1.4.0.

3.1.6 Fixed data length setting error issue when using CSIG Master and CSIG Slave component.

When using CSI master mode and CSI Slave mode with CSIG, data transmission occurs error when data length is selected as “2 bits”, “3 bits”, “4 bits”, “5 bits” and “6 bits” on GUI.
Please refer to the document number R20TS0679 of RENESAS TOOL NEWS.
This issue has been fixed from SC for RH850 V1.4.0.

3.1.7 Fixed generated code wrong issue when specifying “High level” as CS active signal for CSIH Master component.

When using CSI master mode with CSIH and specifying “High level” as CS active signal, the data transmission with slave device failed.
Please refer to the document number R20TS0679 of RENESAS TOOL NEWS.
This issue has been fixed from SC for RH850 V1.4.0.

3.1.8 Fixed generated code wrong issue when specifying “16 bits” or “8 bits” as the CRC input bit width for CRC component.

When using Data CRC component and specifying “16 bits” or “8 bits” as the CRC input bit width, the CRC result will be wrong.
Please refer to the document number R20TS0679 of RENESAS TOOL NEWS.
This issue has been fixed from SC for RH850 V1.4.0.

3.1.9 Fixed generated code wrong issue for output pulse width when using One-Pulse Output and One-Shot Pulse Output components.

When using One-Pulse Output and One-Shot Pulse Output components, the actual output pulse width has one count clock cycle error due to wrong value is set to timer data register.
Please refer to the document number R20TS0679 of RENESAS TOOL NEWS.
This issue has been fixed from SC for RH850 V1.4.0.

3.1.10 Fixed generated code wrong issue for slave channel priority when using PWM Output and Triangle PWM Output components.

When using PWM Output and Triangle PWM Output components, the slave channel interrupt priority is always same as master channel even though user has set different priority level on GUI
Please refer to the document number R20TS0679 of RENESAS TOOL NEWS.
This issue has been fixed from SC for RH850 V1.4.0.

3.2 Specification changes

Table 3-2 List of Specification changes

✓: Applicable, -: Not Applicable

No	Description	RH850F 1KM	RH850 U2A	Remarks
1	Improved Triangle PWM Output with Dead Time UI for being more user-friendly.	-	✓	
2	Improved “r_cg_main.c” file can be registered on CS+ file tree when selecting “application for Multi-core (CC-RH)” project in CS+.	-	✓	
3	New API for changing CRC data initial value is added for CRC component.	✓	✓	
4	Improved GHS project file "project.gpj" is split into "project.gpj" and "sc_file.gpj".	✓	✓	
5	Improved one configuration can be added to a dedicated peripheral on Hardware tree.	✓	✓	
6	Toolbar icons update	✓	✓	

3.2.1 Improved Triangle PWM Output with Dead Time UI for being more user-friendly.

From Smart Configurator for RH850 V1.4.0, Triangle PWM Output with Dead Time component UI is improved by adding more information, so that user can easily know the parameter value for this function. The following information is added:

- The information of actual value after user setting
- The information for slave output level setting

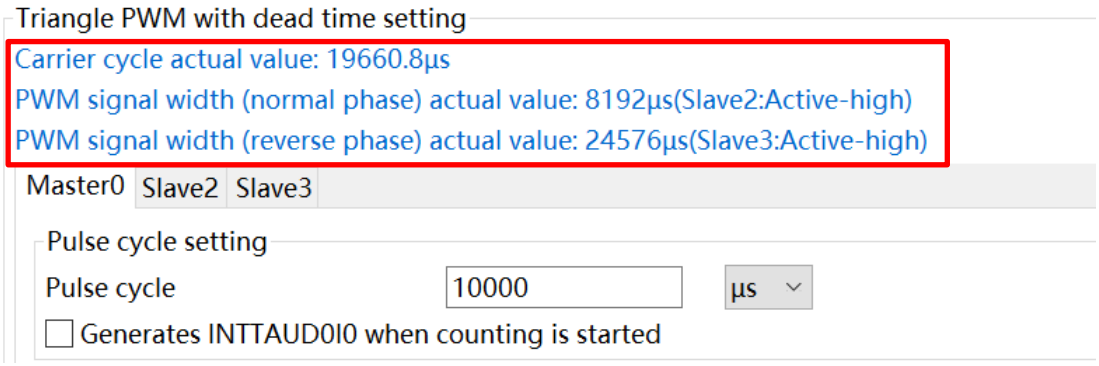


Figure 3-2. Information for actual value

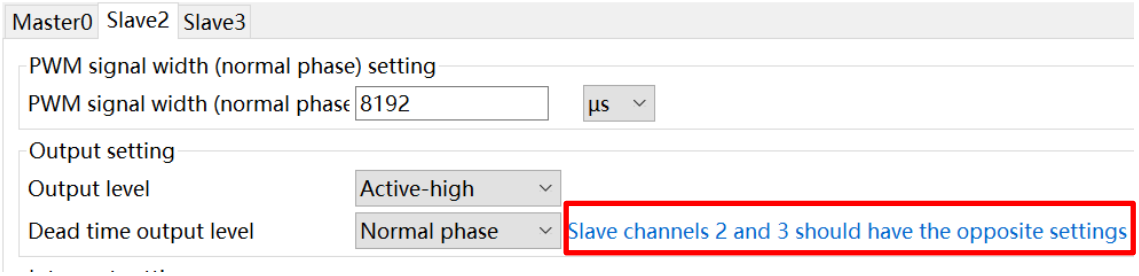


Figure 3-3. Information for slave output level setting

3.2.2 Improved “r_cg_main.c” file can be registered on CS+ file tree when selecting “application for Multi-core (CC-RH)” project in CS+.

From Smart Configurator for RH850 V1.4.0, when selecting “application for Multi-core (CC-RH)” project, after Smart Configurator code generation, “r_cg_main.c” file can be registered on CS+ file tree as following figure shows:

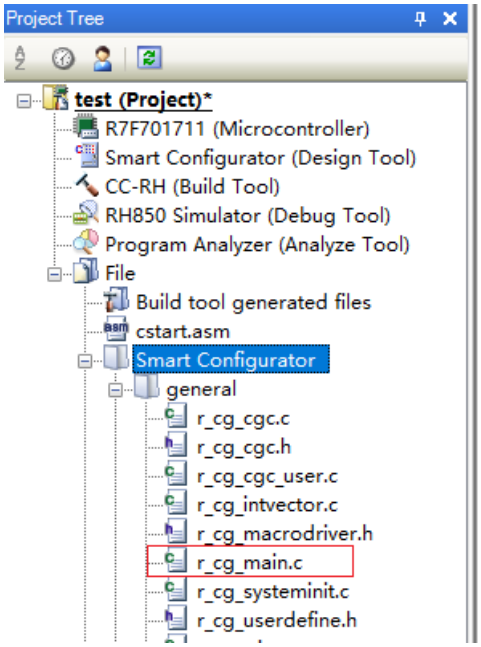


Figure 3-4. “r_cg_main.c” file registered on CS+ file tree

3.2.3 Add new APIs for changing CRC data initial value in CRC component generation code.

From Smart Configurator for RH850 V1.4.0, when generating code for CRC component, new API to change CRC data initial value can be generated. User can use them to change CRC data initial value before calling “void R_[*Config_DCRAn*]_InputXXbitData()” function. The new APIs are as the following:

- void R_[*Config_DCRAn*]_InitializeCRCData(uint32_t crc_data)
- void R_[*Config_KCRCn*]_InitializeCRCData(uint32_t crcout0_data, uint32_t crcout1_data);

3.2.4 Improved GHS project file "project.gpj" is splitted into "project.gpj" and "sc_file.gpj".

From Smart Configurator for RH850 V1.4.0, GHS project file "project.gpj" is splitted into two files: "project.gpj" and "sc_file.gpj". Each time generating code, "project.gpj" are not overwritten any longer, and only "sc_file.gpj" is overwritten, so that compiler options registered into “project.gpj” by users will not be removed.

3.2.5 Improved one configuration can be added to a dedicated peripheral on Hardware tree.

After switching to Hardware tree by clicking "Show by Hardware View", by double clicking one channel node of a peripheral, a configuration can be added under this node. Before SC for RH850 V1.4.0, the configuration appears under all channel nodes of this peripheral and it looks redundant. DMA/DTC/MSPI/GTM-TIM/TAUB/TAUD/TAUJ peripherals have such phenomenon. This issue has been improved from SC for RH850 V1.4. 0.

3.2.6 Toolbar icons update

From Smart Configurator for RH850 V1.4.0, bigger toolbar icons for "Generate Code" and "Generate Report" functions are applied as below.

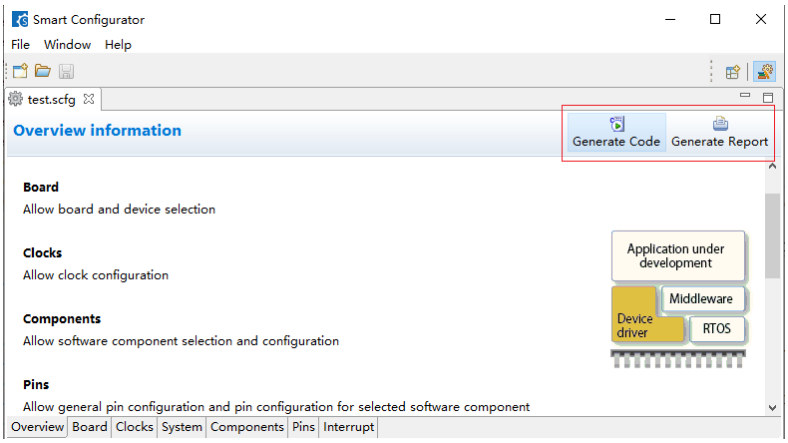


Figure 3-5. Toolbar icons

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 2. RAM size display error https://www.renesas.com/document/tnn/notes-rh850-smart-configurator	RH850F1KM	V1.2.0
Jun. 01, 2016	R20TS0431	When using PLL0 Clock https://www.renesas.com/document/tnn/notes-rh850-smart-configurator-0	RH850F1KM	V1.2.0
Jul.01, 2019	R20TS0441	1. When using PWM output and triangle PWM output slave setting 2. Port input buffer setting error 3. Port drive strength control setting error 4. Port register setting error https://www.renesas.com/document/tnn/notes-smart-configurator-rh850	RH850F1KM	V1.2.0
Aug.01, 2019	R20TS0463	1. When using the input pulse interval measurement function 2. When using the Clocked Serial Interface in Master mode https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-0	RH850F1KM	V1.2.0
Oct.16, 2019	R20TS0500	1. When using data CRC 2. When using one-pulse outputs https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-1	RH850F1KM	V1.2.0
Apr.16, 2020	R20TS0569	When using CSI master and CSI slave https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-2	RH850F1KM	V1.3.0
May.16, 2020	R20TS0576	When using CSI master and CSI slave https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-3	RH850F1KM	V1.3.0
Feb. 16, 2021	R20TS0668	When using CSI master https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-4	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 2. When using CSI Master with CSIH 3. When using Data CRC 4. When using One-Pulse Output and One-Shot Pulse Output 5. When using PWM Output and Triangle PWM Output https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-5	RH850F1KM RH850U2A	V1.4.0

5. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RH850 V1.4.0.

5.1 List of Limitation

Table 5-1 List of Limitation

✓: Applicable, -: Not Applicable

No	Description	RH850F1KM	RH850U2A	RH850F1KH	Remarks
1	Note on using DTS	-	✓	-	

5.2 Details of Limitation

5.3 Note on using DTS

Missing function prototypes in generated code when using DTS components. Manually add the following function prototype to the user code editing area located under Global functions in r_cg_dts.h of the generated code.
Additional function prototype:

- void R_DTS_Suspend(void);
- void R_DTS_Resume(void);

Source example

```
; /***********************************************************************************************************
; Global functions
; ***********************************************************************************************************/
; /* Start user code for function. Do not edit comment generated here */
; void R_DTS_Suspend(void);
; void R_DTS_Resume(void);
; /* End user code. Do not edit comment generated here */
;
```

6. Points for Caution

This section describes points for caution regarding the Smart Configurator for RH850 V1.4.0.

6.1 List of Caution

Table 6-1 List of Caution

✓: Applicable, -: Not Applicable

No	Description	RH850F1KM	RH850U2A	RH850F1KH	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	✓	-	-	

6.2 Details of Caution

6.2.1 About the I/O define header file

Please use Renesas iodefine.h for the header file that defines the register. Because RH850 Smart Configurator outputs code conforming to the definition in Renesas iodefine.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 projects

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 about sample projects.
https://www.renesas.com/search/keyword-search.html#genre=document&q=r20an0516

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

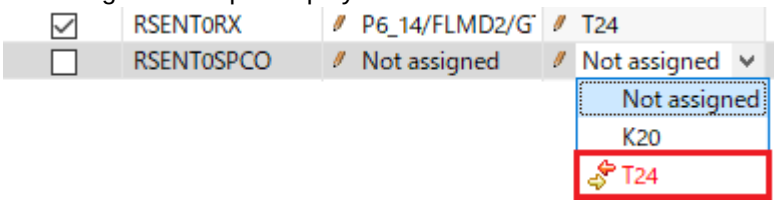


Figure 6-1. pins sharing function sample when assigned

After assignment

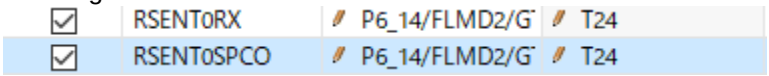


Figure 6-2. pins sharing function sample after assigned

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.

File name change

Before change	After change
r_cg_icu.h	r_cg_intc.h

Macro name change

File name	Before change	After change
r_smc_interrupt.h	ICU_xxx_PRIORITY	INTC_xxx_PRIORITY

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	July.20.19	-	Create new
1.20	Jan.16.20	-	Update to Rev.1.2.0
1.30	Jan.20.21	All	Update to Rev.1.3.0: 1. update format 2. update all changes 3. Page 3, GHS Multi V7.6.1 is changed to GHS Multi V7.1.6
1.40	May.20.21	All	Update to Rev 1.4.0: 1. Support RH850F1KH-D8 2. Add new feature support 3. Update changes including issues and improvements.
1.41	Jun.20.21	4	Update “Table 6-2 Support Devices” and add RH850/F1KH-D8, RH850/U2A16 and RH850/U2A8 device file version.

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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