Smart Configurator for RL78 V1.1.0

Release Note

R20UT4874EC0102
Rev.1.02
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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.

1.1 System requirements

Smart Configurator for RL78 V1.1.0 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: 4 GB or more recommended. Minimum requirement is 2 GB or more (64-bit Windows requires 4 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 RL78 [CC-RL] V1.10 or later
- LLVM for Renesas RL78 10.0.0.202104 or later
- IAR Embedded Workbench for Renesas RL78 V4.21.1 or later
- SMS Assembler Note V1.00.00 or later

Note:

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

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 V1.1.0.

Table 2-1 Support Devices

Group (HW Manual number)	PIN	Device name
RL78/G23 Group (R01UH0896EJ0100)	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

2.2 Support Components List

Below is a list of Components supported by the Smart Configurator for RL78 V1.1.0.

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

No	Components	Mode	RL78/G23	Remarks
1	A/D Converter	-	✓	
2	Clock Output/Buzzer Output Controller	-	✓	
3	Comparator	-	✓	
4	CSI Communication	Transmission	✓	
		Reception	✓	
		Transmission/reception	✓	
5	D/A Converter	-	✓	
6	Data Transfer Controller	-	✓	
7	Delay Counter	-	✓	
8	Divider Function	-	✓	
9	External Event Counter	-	✓	
10	IIC Communication (Master mode)	-	✓	
11	IIC Communication (Slave mode)	-	✓	
12	Input Pulse Interval Measurement	-	✓	
13	Input Signal High-/Low-Level Width Measurement	-	✓	
14	Interrupt Controller	-	✓	
15	Interval Timer	8 bit count mode	✓	
		16 bit count mode	✓	
		16 bit capture mode	✓	
		32 bit count mode	✓	
16	Key Interrupt	-	✓	
17	One-Shot Pulse Output	-	✓	
18	Ports	-	✓	
19	PWM Output	-	✓	
20	Real-Time Clock	-	✓	
21	Remote Control Signal Receiver	-	✓	
22	SNOOZE Mode Sequencer	-	✓	
23	Square Wave Output	-	✓	

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

No	Components	Mode	RL78/G23	Remarks
24	UART Communication	Transmission	✓	
		Reception	✓	
		Transmission/reception	✓	
25	Voltage Detector	-	✓	
26	Watchdog Timer	-	✓	
27	Logic & Event Link Controller	-	✓	Need download in Smart Configurator RL78

2.3 New support

2.3.1 Add additional column labelled "Short name"

From Smart Configurator for RL78 V1.1.0, the "New Component" dialog has added additional column labelled "Short Name" to separate the full descriptive string of the BSP component from the shorter component name as used in the generated source.

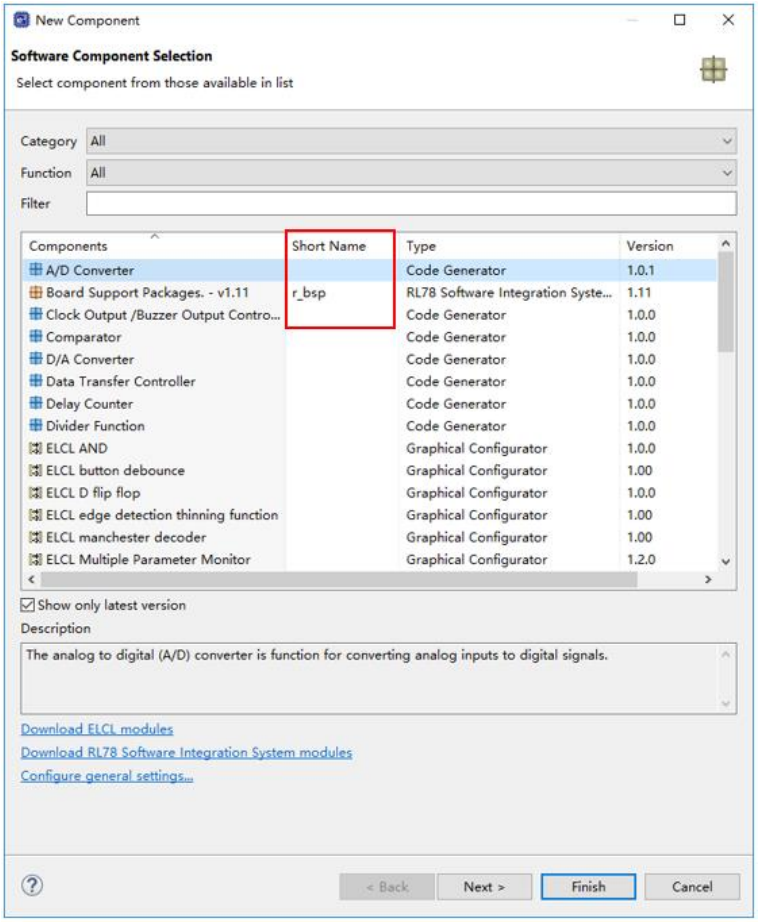

Figure 2-1 Additional column labelled "Short name"

2.3.2 A warning dialog is added for reminding user to save the project before code generation

From Smart Configurator for RL78 V1.1.0, if project settings are not saved before code generation, a warning dialog will pop up to remind user to save the project, user can disable it to pop up by checking “Always save and generate without asking” checkbox.

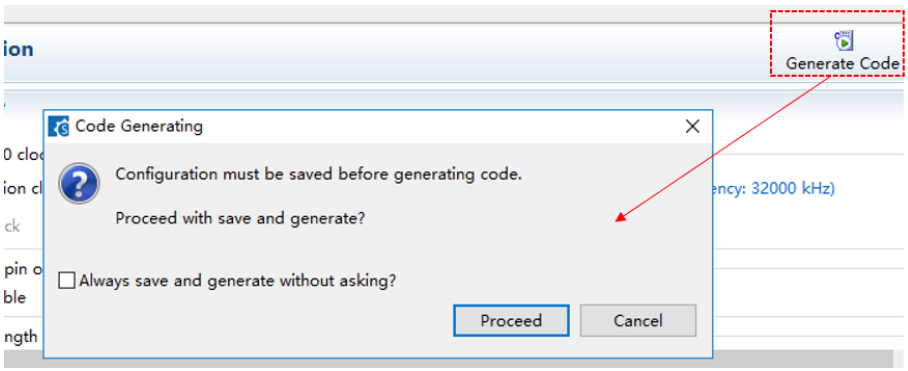

Figure 2-2 A warning dialog is added for reminding user to save the project

2.3.3 Text file encode combo box can input the encoding type for Smart Configurator

From Smart Configurator for RL78 V1.1.0, the encode type is editable through the "Preference" dialog on the Smart Configurator, it is allowed to input the preferred encode type if it is not listed out in the combo box.

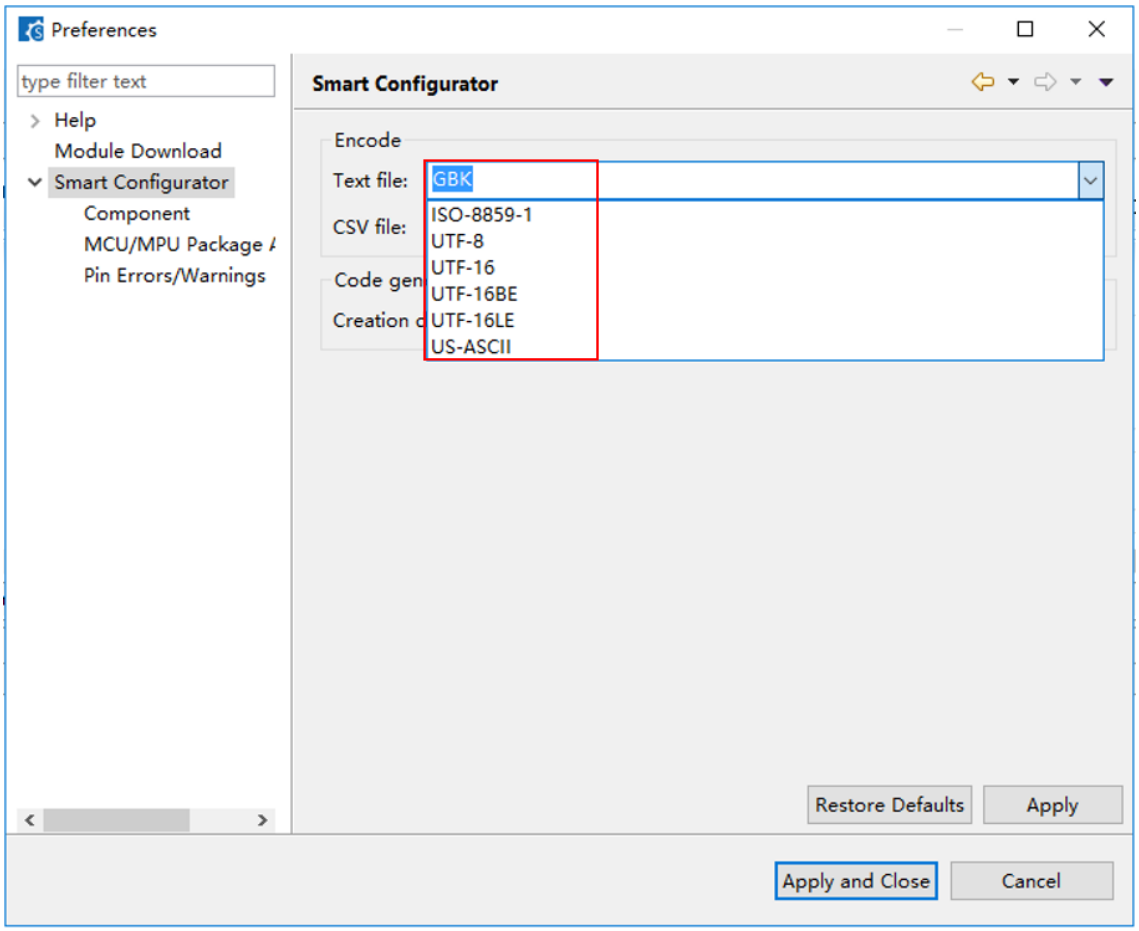

Figure 2-3 Text file encode combo box is editable

3. Changes

This chapter describes changes to the Smart Configurator for RL78 V1.1.0.

3.1 Correction of issues/limitations

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

No	Description	RL78/G23	Remarks
1	Fixed the option byte C1H value when use LVD0	✓	
2	Fixed security ID code issue when using IAR RL78 Toolchain	✓	

3.1.1 Fixed the option byte C1H value when use LVD0

When using LVD0 of voltage detector component, the option byte C1H value is not expected value. This issue has been fixed from Smart Configurator for RL78 V1.1.0.

3.1.2 Fixed security ID code issue when using IAR RL78 Toolchain

When using the security ID in the [System] page with IAR RL78 Toolchain compiler in Smart Configurator, the user security ID isn't generated in code. This issue has been fixed from Smart Configurator for RL78 V1.1.0.

3.2 Specification changes

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

No	Description	RL78/G23	Remarks
1	Improve some macro names of BSP	✓	
2	Improve the readability of generated comments for IIC components	✓	
3	Improve interrupt priority text to display "Level 0 (high)" and "Level 3 (low)" on UI.	✓	
4	Improve the document displayed when importing the sample project (RL78 SIS or other modules) according to current Renesas site	✓	
5	Improve CLKAn clock control in UARTA	✓	
6	Improve P85 generation code including PFOE1 register setting in PORT	✓	

3.2.1 Improve some macro names of BSP

From Smart Configurator RL78 V1.1.0, add “BSP_CFG” to some macros in r_bsp_config.h file:

```
/* Option byte setting(When using IAR) */
#define BSP_CFG_OPTBYTE0_VALUE (0xEFU) /* Generated value. Do not edit this manually */
#define BSP_CFG_OPTBYTE1_VALUE (0x7FU) /* Generated value. Do not edit this manually */
#define BSP_CFG_OPTBYTE2_VALUE (0xE8U) /* Generated value. Do not edit this manually */
#define BSP_CFG_OPTBYTE3_VALUE (0x04U) /* Generated value. Do not edit this manually */

#define BSP_CFG_SUBWAITTIME             (800000U)
#define BSP_CFG_FIHWAITTIME             (80U)
#define BSP_CFG_FIMWAITTIME             (20U)
#define BSP_CFG_FILWAITTIME             (20U)
```

3.2.2 Improve the readability of generated comments for IIC components

Improve readability of comment for each line of code:

1) In file <*Config_IICmn*>_user.c:

Function: static void __near r_<*Config_IICmn*>_interrupt(void)

Comments before improvement:

```
/* Change the waiting time according to the system */
```

Comments after improvement:

```
/* Set delay to secure a hold time after SDA, SDL output. The delay time depend on slave device. Here set xxx µs as default base on current clock */
```

2) In file <*Config_IICAn*>_user.c:

Function: static void r_<*Config_IICAn*>_master_handler(void)

Comments before improvement:

```
static void r_Config_IICA0_master_handler(void)
{
    /* Control for communication */
    if ((0U == IICBSY0) && (0U != g_iica0_tx_cnt))
    {
        r_Config_IICA0_callback_master_error(MD_SPT);
    }
    /* Control for sended address */
    else
    {
        if (0U == (g_iica0_master_status_flag & _80_IICA_ADDRESS_COMPLETE))
        {
```

Comments after improvement:

```
static void r_Config_IICA0_master_handler(void)
{
    /* Detection of stop condition handling */
    if ((0U == IICBSY0) && (0U != g_iica0_tx_cnt))
    {
        r_Config_IICA0_callback_master_error(MD_SPT);
    }
    else
    {
        /* Control for sended address */
        if (0U == (g_iica0_master_status_flag & _80_IICA_ADDRESS_COMPLETE))
        {
```

3.2.3 Improve interrupt priority text to display "Level 0 (high)" and "Level 3 (low)" on UI

From Smart Configurator RL78 V1.1.0, change "high" to "Level 0 (high)", "Low" to "Level 3 (low)" for all components which have interrupt priority selection and the Priority selection of [Interrupt] page.

1) Components UI:

Figure 3-1 Priority level selection in components' UI

2) [Interrupt] page:

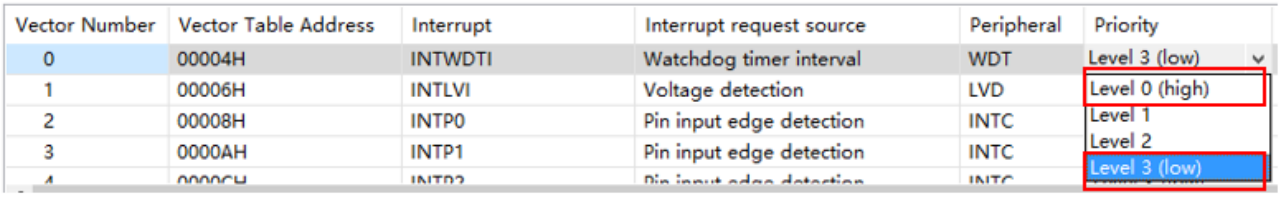

Figure 3-2 Priority level selection in [Interrupt] page

3.2.4 Improve the document displayed when importing the sample project (RL78 SIS or other modules) according to current Renesas site

From Smart Configurator RL78 V1.1.0, user can see the page "END USER LICENSE AGREEMENT" by clicking “Disclaimer002" in EULA dialog.

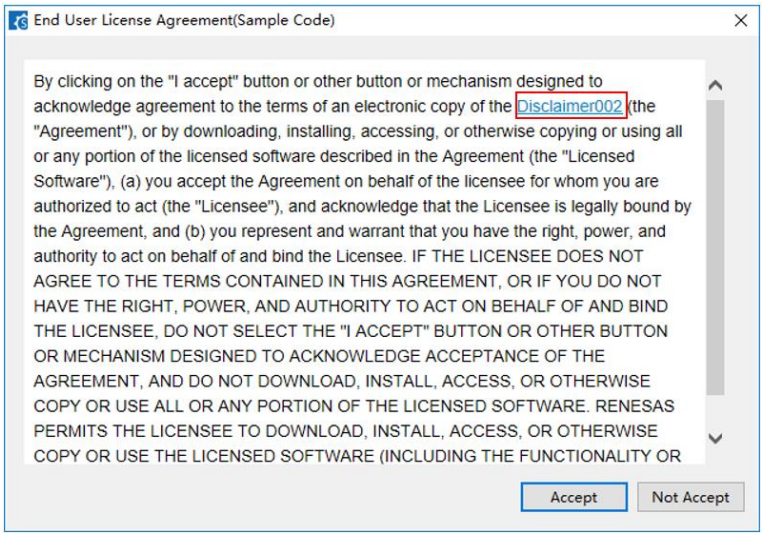

Figure 3-3 EULA dialog

3.2.5 Improve CLKAn clock control in UARTA

From Smart Configurator RL78 V1.1.0, user can set CLKAn pin output disabled or enabled on GUI , then the corresponding code is generated into R_<*Config_UARTAn*>_Create.

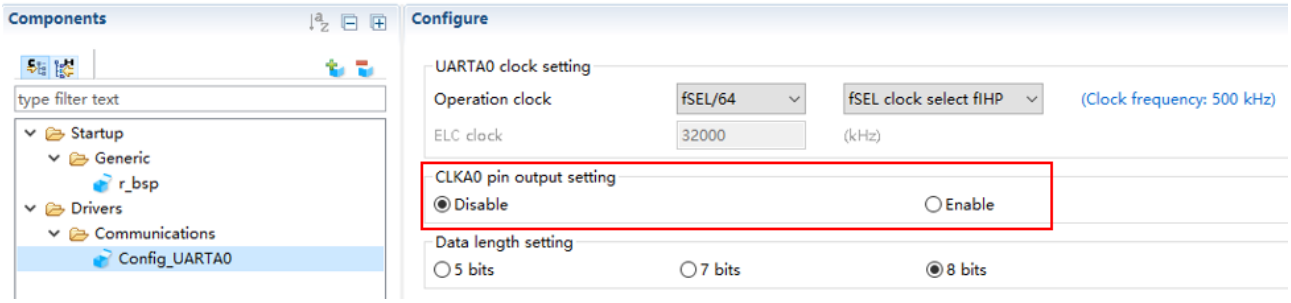

Figure 3-4 CLKA0 pin output selection

3.2.6 Improve P85 generation code including PFOE1 register setting in PORT

From Smart Configurator RL78 V1.1.0, when P85 is used as output function, PFOE15 bit is cleared in R_<*Config_PORT*>_Create.

```
void R_Config_PORT_Create(void)
{
    /* Set PORT8 registers */
    P8 = _00_Pn7_OUTPUT_0 | _00_Pn6_OUTPUT_0 | _00_Pn5_OUTPUT_0 | _00_Pn4_OUTPUT_0 | _00_Pn3_OUTPUT_0 |
         _00_Pn2_OUTPUT_0 | _00_Pn1_OUTPUT_0 | _00_Pn0_OUTPUT_0;
    PFOE1 &= (uint8_t) ~(_20_CLKA0_OUTPUT_ENABLED);
    POM8 = _00_POMn3_NCH_OFF | _00_POMn2_NCH_OFF | _00_POMn1_NCH_OFF | _00_POMn0_NCH_OFF;
    PM8 = _80_PMn7_NOT_USE | _40_PMn6_NOT_USE | _00_PMn5_MODE_OUTPUT | _10_PMn4_NOT_USE | _08_PMn3_NOT_USE |
          _04_PMn2_NOT_USE | _02_PMn1_NOT_USE | _01_PMn0_NOT_USE;

    R_Config_PORT_Create_UserInit();
}
```

Figure 3-8 The code of P85 output function

4. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RL78 V1.1.0.

4.1 List of Limitation

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

No	Description	RL78/G23	Remarks
1	Note on extra help document issue	✓	
2	Note on the callback function of UARTA is not called when transmit 1-byte data	✓	

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.

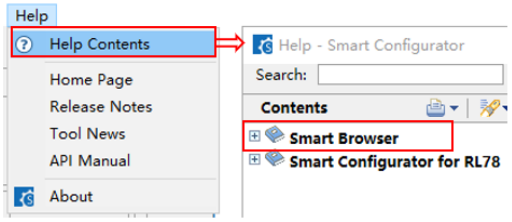

Figure 4-1 Extra help issue

4.2.2 Note on the callback function of UARTA is not called when transmit 1-byte data

When using UARTA transmission function to transmit 1-byte data in [Continuous transmission by polling] mode, even if [Transmission end] callback is selected on GUI, the callback function can't enter.

Workaround:

User can manually modify the following code in function: R_<*Config_UARTAn*>_ Send.

Before modification:

```
MD_STATUS R_<Config_UARTAn>_Send(uint8_t * const tx_buf, uint16_t tx_num)
{
……
   else
   {
      ……
      while (0U != (ASISAn & _20_UARTA_DATA_EXIST_IN_TXBA))
      {
         ;
      }
      ……
   }
……
}
```

After modification:

```
MD_STATUS R_<Config_UARTAn>_Send(uint8_t * const tx_buf, uint16_t tx_num)
{
……
   else
   {
      ……
      while ((0U != (ASISAn & _20_UARTA_DATA_EXIST_IN_TXBA)) || (0U != (ASISAn &
_10_UARTA_HAVE_NEXT_TRANSFER)))
      {
         ;
      }
      ……
   }

   ……
}
```

Revision History

Rev.	Date	Description	
		Page	Summary
1.01	Apr 13, 2021	-	First edition issued
1.02	Jul 20, 2021	3	Update 1.1.2 Development Environments
		4	Update HW manual number in table “Table 2 1 Support Devices”
		7 - 8	Update “2.3 New support”
		9 - 13	Update “3. Changes”
		14-15	Update “4. Points for Limitation”

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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