RENESAS

AP4 for RZ V1.03.00

Release Note

Contents

Chapter 1. Introduction

AP4 for RZ is a software tool to generate control programs (device driver programs) for peripheral modules (timers, UART, A/D, etc.). It generates device driver codes using user settings through GUI. Initialize code and API (Application Programming Interface) functions are provided.

Chapter 2. Target Devices

Below is a list of devices supported by the AP4 for RZ V1.03.00

RZ/T1 group	
PIN	**Device name**
176pin	R7S910001CFP, R7S910101CFP
320pin	R7S910002CBG, R7S910102CBG, R7S910006CBG, R7S910106CBG R7S910007CBG, R7S910107CBG, R7S910011CBG, R7S910111CBG R7S910013CBG, R7S910113CBG, R7S910015CBG, R7S910115CBG R7S910016CBG, R7S910116CBG, R7S910017CBG, R7S910117CBG R7S910018CBG, R7S910118CBG, R7S910025CBG, R7S910125CBG R7S910026CBG, R7S910126CBG, R7S910027CBG, R7S910127CBG R7S910028CBG, R7S910128CBG

Following documents.

Manual Name	Document Number
RZ/T1 Group User's Manual: Hardware	R01UH0483JJ0100
	R01UH0483EJ0100

Chapter 3. Operating Environment

■ Host machine

- IBM PC/AT compatibles (Windows® 10, Windows® 8.1, Windows® 7, Windows Vista®)
- 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 G 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
  - .NET Framework version4.5
  - Microsoft Visual C++ 2010 SP1 runtime library

■ Development Environments

Product Name	Version
IAR Embedded Workbench for ARM	V7.50 or later
KPIT GNU Tool GNUARM-NONE-EABI	V15.01 or later
ARM Development Suite (DS-5™)	V5.21.1 or later

Chapter 4. Changes

This chapter describes change from AP for RZ V1.02.00 to V1.03.00.

4.1 Changes List

No	Description	Version *1
		RZ/T1 ------------ V1.02.00.02
1	New development Environments supported (ARM Development Suite (DS-5™))	-
2	Changes of I2C bus interface settings (RIICa)Changes of I2C bus interface settings (RIICa)	-
3	Change in the operation environment	-
4	Changes of Multi Encoder I/F	-
5	Changes of data length of CRC	-
6	Changes of Multi-Function Pin Controller (MPC)	○
7	Changes of a data bus size of SPI Multi I/O Bus Controller (SPIBSC)	○
8	About the setting flow of the Device List View or the Device Top View	○
9	About the setting procedure of the Delta Sigma Interface (DSMIF)	○
10	Changes of erroneous descriptions in the Device List View and the Device Top View	○
11	Changes of the Zoom icon of the Device Top View	○
12	Changes of the count operation of Multi-Function Timer Pulse Unit (MTU3a) MTU6 and MTU7	○
13	Changes of the PWM output setting for MTU7 of the Multi-Function Timer Pulse Unit (MTU3a)	○
14	Changes of the PWM output setting for MTU4 of the Multi-Function Timer Pulse Unit (MTU3a)	○
15	About of adding the procedure after writing to Interrupt Address Register (HVA0) register for the Cortex-R4F Vector Interrupt Controller (VIC)	○

○: Correspondence, ⁻: Not correspondence (finish of correction), ╱: Outside of function

Note 1: Version is described in the generated code.

4.2   Changes Details

4.2.1 New development Environments supported (ARM Development Suite (DS-5™))

Code Generator can be generated control programs for ARM Development Suite (DS-5™).
This issue has been corrected in V1.01.00.

4.2.2 Changes of I2C bus interface settings (RIICa)

When using the I2C bus interface (RIICa) for master reception, the interrupt following sending of the slave address cannot be accepted, since the transmission data empty interrupt (TXI) is in the interrupt-masked state.
This issue has been corrected in V1.01.00.

4.2.3 Change in the operation environment

Support for Windows 8 has been ended from AP4 for RZ V1.02.00.
If you wish to continue using AP4, please consider upgrading OS from Windows 8 to Windows 8.1.

4.2.4 Changes of Multi Encoder I/F

AP4 for RZ can generate I/O pin setting programs for Multi Encoder I/F. Using Device List View or Device Top View for setting pin function.
For details of Multi Encoder I/F, contact our sales representative.
This issue has been corrected in V1.02.00.

4.2.5 Changes of data length of CRC

When using CRC Operation Units (CRC), Data subject to CRC operation can select for 8, 16, or 32 bits long.
This issue has been corrected in V1.02.00.

4.2.6 Changes of Multi-Function Pin Controller (MPC)

AP4 for RZ can generate I/O pin setting programs for the following peripherals. Using Device List View or Device Top View for setting pin function. Also, a pin conflict between peripheral functions can be verified.
    (1) Ethernet MAC (ETHERC)
    (2) EtherCAT Slave Controller
    (3) USB2.0HS Host Module (USBh)
    (4) CAN Interface (RSCAN)
    (5) Serial Sound Interface (SSI)
This issue has been corrected in V1.03.00.

4.2.7 Changes of a data bus size of SPI Multi I/O Bus Controller (SPIBSC)

In previous version, When using SPI Multi I/O Bus Controller (SPIBSC), SPBIOn pins (n=0 to 3) is used in spite of data bus size setting. Since only selected pins in the data bus size is used, unused SPBIOn pins can be assigned to other peripheral functions.
This issue has been corrected in V1.03.00.

4.2.8 About the setting flow of the Device List View or the Device Top View

When using the pin settings by the Device List View or the Device Top View, start by setting peripheral functions and only then set the pin settings.
If you don't make setting in the procedure, the pin settings are returned to their initial states.
This issue has been corrected in V1.03.00.

4.2.9 About the setting procedure of the Delta Sigma Interface (DSMIF)

When using the Delta Sigma Interface (DSMIF), DSMIF Status register and Error Control Module (ECM) always report errors, due to errors in the setting procedure.
Additionally, ECM for DSMIF UNIT1 always reports errors because of wrong description of both register address of DSMIF and ECM Error source number.
Refer to the Technical Updates on the relevant device for details.

  https://www.renesas.com/search/keyword-search.html#genre=document&q=tnrza

  Correcting wrong description of Delta Sigma Interface (DSMIF) specification in RZ/T1 Group User's Manual Hardware.
  Document No. TN-RZ*-A008A/E
This issue has been corrected in V1.03.00.

4.2.10 Changes of erroneous descriptions in the Device List View and the Device Top View

Several wrong description of the Device List View and the Device Top View in RZ/T1 Group 176-pin devices.

    Before correction: 35pin USB_DP

                     37pin USB_RREF

    After correction : 35pin USB_RREF

                     37pin USB_DP

Refer to the Technical Updates on the relevant device for details.

  https://www.renesas.com/search/keyword-search.html#genre=document&q=tnrza

  Correcting wrong pin assignments for 176-pin HLQFP in RZ/T1 Group User's Manual Hardware and Datasheet
  Document No. TN-RZ*-A009A/E
This issue has been corrected in V1.03.00.

4.2.11 Changes of the Zoom icon of the Device Top View

When using the Zoom icon, the Device Top View can not be expand to readable size of the pin information.
[Workaround] After clicking the device top view, user can do this by mouse-wheel.
This issue has been corrected in V1.03.00.

4.2.12 Changes of the count operation of Multi-Function Timer Pulse Unit (MTU3a) MTU6 and MTU7

An error appears in the generated code when the normal mode or PWM mode1 is selected for MTU6 and MTU7 of the Multi-Function Timer Pulse Unit (MTU3a). Due to an error in setting the TSTRB register, MTU6.TCNT count operation is stopped.

[Workaround] Modify the output code of void R_MTU3_C7_Start(void) in the way shown below.
The function is in the r_cg_mtu3.c file. This modification is required every time code is generated.

Before modification:
```
void R_MTU3_C7_Start(void)
{
    MTU.TSTRB.BYTE = _MTU_CST7_ON;
}
```

After modification:
```
void R_MTU3_C7_Start(void)
{
    MTU.TSTRB.BYTE |= _MTU_CST7_ON;
}
```

This issue has been corrected in V1.03.00.

4.2.13 Changes of the PWM output setting for MTU7 of the Multi-Function Timer Pulse Unit (MTU3a)

When the PWM mode1 is selected for MTU7 of the Multi-Function Timer Pulse Unit (MTU3a) and MTIOC7A or MTIOC7C pins function as PWM output pins, due to an error in setting the TOERB register, the output pins can not be set for PWM output.

[Workaround] Modify the output code of void R_MTU3_Create(void)in the way shown below.
The function is in the r_cg_mtu3.c file. This modification is required every time code is generated.

Before modification: Example of setting to output MTIOC7A and MTIOC7C pins
```
void R_MTU3_Create(void)
{
    .........
    /* Channel 7 is used as PWM1 mode */
    .........
    MTU7.TMDR1.BYTE |= _MTU_PWM1;
    .........
}
```

After modification:
```
void R_MTU3_Create(void)
{
    .........
    /* Channel 7 is used as PWM1 mode */
    .........
    MTU7.TMDR1.BYTE |= _MTU_PWM1;
    MTU.TOERB.BYTE |= _MTU_OE7A_ENABLE | _MTU_OE7C_ENABLE;
    .........
}
```

This issue has been corrected in V1.03.00.

4.2.14 Changes of the PWM output setting for MTU4 of the Multi-Function Timer Pulse Unit (MTU3a)

When the PWM mode1 is selected for MTU4 of the Multi-Function Timer Pulse Unit (MTU3a) and MTIOC4A or MTIOC4C pins function cut off, due to an error in setting the TOERA register, the output pins are set for PWM output.

[Workaround] Modify the output code of void R_MTU3_Create(void)in the way shown below.
The function is in the r_cg_mtu3.c file. This modification is required every time code is generated.

Before modification: Example of setting to MTIOC4A pins function cut off
```
    void R_MTU3_Create(void)
    {
        .........
        /* Channel 4 is used as PWM1 mode */
        .........
        MTU4.TMDR1.BYTE |= _MTU_PWM1;
        MTU.TOERA.BYTE |= _MTU_OE4C_ENABLE | _MTU_OE4A_ENABLE;
        .........
    }
```

After modification:
```
    void R_MTU3_Create(void)
    {
        .........
        /* Channel 4 is used as PWM1 mode */
        .........
        MTU7.TMDR1.BYTE |= _MTU_PWM1;
        MTU.TOERA.BYTE |= _MTU_OE4C_ENABLE;
        .........
    }
```
This issue has been corrected in V1.03.00.

4.2.15 About of adding the procedure after writing to Interrupt Address Register (HVA0) register for the Cortex-R4F Vector Interrupt Controller (VIC)

Due to the interrupt service routine is completed before the vic module is notified of an end of interrupt processing, adding the dmb instruction for the correction.

[Workaround] Modify the output code in the way shown below. This modification is required every time code is generated.

Before modification: void R_Systeminit(void) in the r_cg_mtu3.c file.
```
    void R_Systeminit(void)
    {
        .........
        /* Dummy write */
```

```
        VIC.HVA0.LONG = 0x00000000UL;
        .........

      }


After modification:  void R_Systeminit(void) in the r_cg_mtu3.c file.
    void R_Systeminit(void)
  {
     .........
      /* Dummy write */
      VIC.HVA0.LONG = 0x00000000UL;
      asm（"dmb"）;         /* In the case of DS-5, "__asm（"dmb"）;" */
      .........

  }



Before modification: void r_fiq_handler(void) in the r_cg_intprg.c file
    void r_fiq_handler(void)
  {
     if (1U == ICU.NMISR.BIT.NMIST)
     {
        r_icu_nmi_interrupt();
     }
     /* Start user code. Do not edit comment generated here */
     /* End user code. Do not edit comment generated here */
  }


After modification: void r_fiq_handler(void) in the r_cg_intprg.c file
    void r_fiq_handler(void)
  {
     if (1U == ICU.NMISR.BIT.NMIST)
     {
        r_icu_nmi_interrupt();
     }
     /* Start user code. Do not edit comment generated here */
     /* End user code. Do not edit comment generated here */
      /* Dummy write */
      VIC.HVA0.LONG = 0x00000000UL;
      asm（"dmb"）;        /* In the case of DS-5,*/
                          /* "__asm（"dmb"）;" */
  }


Before modification: Example of Compare Match Timer0 (CMT0)
    void r_cmt_cmi0_interrupt(void)
  {
     .........
      /* Dummy write */
      VIC.HVA0.LONG = 0x00000000UL;
```

```
                .........

            }


        After modification: Example of Compare Match Timer0 (CMT0)
            void r_cmt_cmi0_interrupt(void)
        {
            .........
            /* Dummy write */
            VIC.HVA0.LONG = 0x00000000UL;
            asm（"dmb"）;          /* In the case of DS-5, "__asm（"dmb"）;" */
            .........

        }
```
This issue has been corrected in V1.03.00.

Chapter 5. Cautions

This section describes cautions for using AP4 for RZ V1.03.00.

5.1 Cautions List

No	Description	Version *1
		RZ/T1 / V1.02.00.02
1	About online Help	○
2	List of output files and APIs	○
3	Addition of Pin View	○
4	Cautions of Multiple Interrupts	○

○: Correspondence, /: Outside of function

Note 1: Version is described in the generated code.

5.2   Cautions Details

5.2.1 About online Help

AP4 for RZ is not supporting online help.
[Workaround] There is no workaround.

5.2.2 List of output files and APIs

Below is a list of output files and APIs by AP4 for RZ V1.03.00.

Refer to User's Manual: RZ/T1 API Reference for detail information about the API functions.

Peripheral Function	File Name	API Function Name
Common	r_cg_main.c	main
		R_MAIN_UserInit
	r_cg_mpc.c	R_MPC_Create
		R_MPC_Create_UserInit
	r_cg_systeminit.c	R_SystemInit
	r_cg_intprg.c	r_set_exception_handler
		r_fiq_handler
	r_cg_macrodriver.h	－
	r_cg_userdefine.h	－
Clock generator	r_cg_cgc.c	R_CGC_Create
	r_cg_cgc_user.c	R_CGC_Create_UserInit
	r_cg_cgc.h	－
Interrupt Controller	r_cg_icu.c	R_ICU_Create
		R_ICU_IRQn_Start
		R_ICU_IRQn_Stop
		R_ICU_ETHPHYIn_Start
		R_ICU_ETHPHYIn_Stop
	r_cg_icu_user.c	R_ICU_Create_UserInit
		r_icu_nmi_interrupt
		r_icu_irqn_interrupt
		r_icu_ethphyin_interrupt
	r_cg_icu.h	－
Bus State Controller	r_cg_bsc.c	R_BSC_Create
		R_BSC_InitializeSDRAM
		R_BSC_SDRAMPowerDown_Start
		R_BSC_SDRAMPowerDown_Stop
		R_BSC_SDRAMDeepPowerDown_Start
		R_BSC_SDRAMDeepPowerDown_Stop
	r_cg_bsc_user.c	R_BSC_Create_UserInit
		r_bsc_bsccmi_interrupt
	r_cg_bsc.h	－
DMA Controller	r_cg_dmac.c	R_DMACn_Create
		R_DMACn_Set_SoftwareTrigger
		R_DMACm_Cn_Start

Peripheral Function	File Name	API Function Name
		R_DMACm_Cn_Stop
		R_DMACm_Cn_Suspend
		R_DMACm_Cn_SuspendClear
	r_cg_dmac_user.c	R_DMACn_Create_UserInit
		r_dmaintn_interrupt
		r_dmac_dmasrqm_interrupt
	r_cg_dmac.h	－
Event Link Controller	r_cg_elc.c	R_ELC_Create
		R_ELC_Start
		R_ELC_Stop
		R_ELC_GenerateSoftwareEvent
		R_ELC_Get_PortBuffern
		R_ELC_Set_PortBuffern
	r_cg_elc_user.c	R_ELC_Create_UserInit
		r_elc_elcirqn_interrupt
	r_cg_elc.h	－
I/O Ports	r_cg_port.c	R_PORT_Create
	r_cg_port_user.c	R_PORT_Create_UserInit
	r_cg_port.h	－
Multi-Function Timer Pulse Unit 3	r_cg_mtu3.c	R_MTU3_Create
		R_MTU3_Cm_Start
		R_MTU3_Cm_Stop
	r_cg_mtu3_user.c	R_MTU3_Create_UserInit
		r_mtu3_tgiam_interrupt
		r_mtu3_tgibm_interrupt
		r_mtu3_tgicm_interrupt
		r_mtu3_tgidm_interrupt
		r_mtu3_tgie0_interrupt
		r_mtu3_tgif0_interrupt
		r_mtu3_tcivm_interrupt
		r_mtu3_tcium_interrupt
		r_mtu3_tgiu5_interrupt
		r_mtu3_tgiv5_interrupt
		r_mtu3_tgiw5_interrupt
		r_mtu3_c4_tgia4_interrupt
		r_mtu3_c4_tgib4_interrupt
		r_mtu3_c4_tciv4_interrupt
		r_mtu3_c7_tgia7_interrupt
		r_mtu3_c7_tgib7_interrupt
		r_mtu3_c7_tciv7_interrupt
	r_cg_mtu3.h	－
Port Output Enable 3	r_cg_poe3.c	R_POE3_Create
		R_POE3_Start
		R_POE3_Stop
	r_cg_poe3_user.c	R_POE3_Create_UserInit
		r_poe3_oein_interrupt
	r_cg_poe3.h	－

Peripheral Function	File Name	API Function Name
General PWM Timer	r_cg_gpt.c	R_GPT_Create
		R_GPTn_Start
		R_GPTn_Stop
	r_cg_gpt_user.c	R_GPT_Create_UserInit
		r_gtp_etgin_interrupt
		r_gtp_etgip_interrupt
		r_gtp_gtcian_interrupt
		r_gtp_gtcibn_interrupt
		r_gtp_gtcicn_interrupt
		r_gtp_gicidn_interrupt
		r_gtp_gtcien_interrupt
		r_gtp_gtcifn_interrupt
		r_gtp_gdten_interrupt
		r_gtp_gtcivn_interrupt
		r_gtp_gtciun_interrupt
	r_cg_gpt.h	－
16-Bit Timer Pulse Unit	r_cg_tpu.c	R_TPU_Create
		R_TPUn_Start
		R_TPUn_Stop
	r_cg_tpu_user.c	R_TPU_Create_UserInit
		r_tpu_tgina_interrupt
		r_tpu_tginb_interrupt
		r_tpu_tginc_interrupt
		r_tpu_tgind_interrupt
		r_tpu_tcinv_interrupt
		r_tpu_tcinu_interrupt
	r_cg_tpu.h	－
Programmable Pulse Generator	r_cg_ppg.c	R_CMTn_Create
		R_CMTn_Start
		R_CMTn_Stop
	r_cg_ppg_user.c	R_CMTn_Create_UserInit
		r_cmt_cmin_interrupt
	r_cg_ppg.h	－
Compare Match Timer	r_cg_cmt.c	R_CMTn_Create
		R_CMTn_Start
		R_CMTn_Stop
	r_cg_cmt_user.c	R_CMTn_Create_UserInit
		r_cmt_cmin_interrupt
	r_cg_cmt.h	－
Compare Match Timer W	r_cg_cmtw.c	R_CMTWm_Create
		R_CMTWm_Start
		R_CMTWm_Stop
	r_cg_cmtw_user.c	R_CMTWm_Create_UserInit
		r_cmtw_cmwim_interrupt
		r_cmtw_icnim_interrupt
		r_cmtw_ocnim_interrupt
	r_cg_cmtw.h	－

Peripheral Function	File Name	API Function Name
Watchdog Timer	r_cg_wdt.c	R_WDTn_Create
		R_WDTn_Restart
	r_cg_wdt_user.c	R_WDTn_Create_UserInit
	r_cg_wdt.h	－
Independent Watchdog Timer	r_cg_iwdt.c	R_IWDT_Create
		R_IWDT_Restart
	r_cg_iwdt_user.c	R_IWDT_Create_UserInit
	r_cg_iwdt.h	－
Serial Communications Interface with FIFO	r_cg_scifa.c	R_SCIFAn_Create
		R_SCIFAn_Start
		R_SCIFAn_Stop
		R_SCIFAn_Serial_Send
		R_SCIFAn_Serial_Receive
		R_SCIFAn_Serial_Send_Receive
	r_cg_scifa_user.c	R_SCIFAn_Create_UserInit
		r_scifan_txifn_interrupt
		r_scifan_rxifn_interrupt
		r_scifan_brifn_interrupt
		r_scifan_drifn_interrupt
		r_scifan_teifn_interrupt
		r_scifan_erifn_interrupt
		r_scifan_callback_transmitend
		r_scifan_callback_receiveend
		r_scifan_callback_error
	r_cg_scifa.h	－
I2C Bus Interface	r_cg_riic.c	R_RIICn_Create
		R_RIICn_Start
		R_RIICn_Stop
		R_RIICn_Master_Send
		R_RIICn_Master_Receive
		R_RIICn_Slave_Send
		R_RIICn_Slave_Receive
		R_RIICn_StartCondition
		R_RIICn_StopCondition
	r_cg_riic_user.c	R_RIICn_Create_UserInit
		r_riicn_error_interrupt
		r_riicn_receive_interrupt
		r_riicn_transmit_interrupt
		r_riicn_transmitend_interrupt
		r_riicn_callback_receiveerror
		r_riicn_callback_transmitend
		r_riicn_callback_receiveend
	r_cg_riic.h	－
Serial Peripheral Interface	r_cg_rspi.c	R_RSPIn_Create
		R_RSPIn_Start
		R_RSPIn_Stop
		R_RSPIn_Send

Peripheral Function	File Name	API Function Name
		R_RSPIn_Send_Receive
	r_cg_rspi_user.c	R_RSPIn_Create_UserInit
		r_rspin_receive_interrupt
		r_rspin_transmit_interrupt
		r_rspin_error_interrupt
		r_rspin_idle_interrupt
		r_rspin_callback_receiveend
		r_rspin_callback_error
		r_rspin_callback_transmitend
	r_cg_rspi.h	─
SPI Multi I/O Bus Controller	r_cg_spibsc.c	R_SPIBSC_Create
		R_SPIBSC_EAVUpperAddressChange
		R_SPIBSC_SPIRead
		R_SPIBSC_SPIWrite
		R_SPIBSC_SPIRead_Write
	r_cg_spibsc_user.c	R_SPIBSC_Create_UserInit
	r_cg_spibsc.h	─
CRC Operation Units	r_cg_crc.c	R_CRC_SetCRC8_2F
		R_CRC_SetCRC8_SAE
		R_CRC_SetCRC16_CCITT
		R_CRC_SetCRC32_ETHER
		R_CRC_Input_Data
		R_CRC_Get_Result
ΔΣ Interface	r_cg_dsmif.c	R_DSMIF_Create
		R_DSMIF_UVW_Start
		R_DSMIF_UVW_Stop
		R_DSMIF_X_Start
		R_DSMIF_X_Stop
	r_cg_dsmif_user.c	R_DSMIF_Create_UserInit
	r_cg_dsmif.h	─
Error Control Module	r_cg_emc.c	R_ECM_Create
		R_EMC_Pseudo_WDT0_Error_Start
		R_EMC_Pseudo_WDT0_Error_Stop
		R_EMC_Pseudo_WDT1_Error_Start
		R_EMC_Pseudo_WDT1_Error_Stop
		R_EMC_Pseudo_IWDTa_Error_Start
		R_EMC_Pseudo_IWDTa_Error_Stop
		R_EMC_Pseudo_ADC_Unit0_Error_Start
		R_EMC_Pseudo_ADC_Unit0_Error_Stop
		R_EMC_Pseudo_ADC_Unit1_Error_Start
		R_EMC_Pseudo_ADC_Unit1_Error_Stop
		R_EMC_Pseudo_DSMIF_UVWovercurrent_Error_Start
		R_EMC_Pseudo_DSMIF_UVWovercurrent_Error_Stop
		R_EMC_Pseudo_DSMIF_UVWtotalcurrent_Error_Start
		R_EMC_Pseudo_DSMIF_UVWtotalcurrent_Error_Stop
		R_EMC_Pseudo_DSMIF_UVWshortcircuit_Error_Start
		R_EMC_Pseudo_DSMIF_UVWshortcircuit_Error_Stop

Peripheral Function	File Name	API Function Name
		R_EMC_Pseudo_DSMIF_Xovercurrent_Error_Start
		R_EMC_Pseudo_DSMIF_Xovercurrent_Error_Stop
		R_EMC_Pseudo_DSMIF_Xshortcircuit_Error_Start
		R_EMC_Pseudo_DSMIF_Xshortcircuit_Error_Stop
		R_EMC_Pseudo_DOC_Error_Start
		R_EMC_Pseudo_DOC_Error_Stop
		R_EMC_Pseudo_BSC_Error_Start
		R_EMC_Pseudo_BSC_Error_Stop
		R_EMC_Pseudo_Error35_Error_Start
		R_EMC_Pseudo_Error35_Error_Stop
		R_EMC_Pseudo_Error36_Error_Start
		R_EMC_Pseudo_Error36_Error_Stop
		R_EMC_Pseudo_Error37_Error_Start
		R_EMC_Pseudo_Error37_Error_Stop
		R_EMC_Pseudo_Error38_Error_Start
		R_EMC_Pseudo_Error38_Error_Stop
		R_EMC_Pseudo_Error39_Error_Start
		R_EMC_Pseudo_Error39_Error_Stop
		R_EMC_Pseudo_Error40_Error_Start
		R_EMC_Pseudo_Error40_Error_Stop
		R_EMC_Pseudo_Error41_Error_Start
		R_EMC_Pseudo_Error41_Error_Stop
		R_EMC_Pseudo_EMC_CompareError_Error_Start
		R_EMC_Pseudo_EMC_CompareError_Error_Stop
		R_EMC_Pseudo_EMC_DelayTimerOverflow_Error_Start
		R_EMC_Pseudo_EMC_DelayTimerOverflow_Error_Stop
	r_cg_emc_user.c	R_ECM_Create_UserInit
		r_ecm_nmi_interrupt
		r_ecm_errd_interrupt
	r_cg_emc.h	-
12-Bit A/D Converter	r_cg_s12ad.c	R_S12ADn_Create
		R_S12ADn_Start
		R_S12ADn_Stop
		R_S12ADn_Get_ValueResult
		R_S12ADn_Set_CompareValue
	r_cg_s12ad_user.c	R_S12ADn_Create_UserInit
		r_s12ad_s12adn_interrupt
		r_s12ad_s12gbadin_interrupt
		r_s12ad_s12cmpn_interrupt
	r_cg_s12ad.h	-
Data Operation Circuit	r_cg_doc.c	R_DOC_Create
		R_DOC_SetMode
		R_DOC_WriteData
		R_DOC_GetResult
		R_DOC_ClearFlag
	r_cg_doc_user.c	R_DOC_Create_UserInit
	r_cg_doc.h	-

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5.2.3 Addition of Pin View

Pin View shows pin settings set by CG and allows user to configure pin settings.

Pin View has two view; Device List View and Device Top View and the two views are linked, so that settings can be made in either of them.

Device List View

Device list View shows the pin settings by the table style. Device list View has two lists; Pin Number and Pin Function.

Pin Number List

Pin Number List shows all assigned pins sorted by the pin number. If pins have multiple functions, Pin Number List allows to user to configure the functions.

Pin Number	Pin Name	Selected Function	Pin Direction	Pin Remarks
A1	VSS	VSS	–	
A2	PC2/ ETH0_TXC/ ETH1_RX…	Not assigned	–	
A3	PJ3/ IRQ11/ ETH0_TXD0/ …	Not assigned	–	
A4	PJ1/ ETH0_TXD2/ CATLE…	Not assigned	–	
A5	PF7/ IRQ7/ A25/ ETH0_TX…	Not assigned	–	
A6	PB4/ A24/ ETH1_COL/ ET…	Not assigned	–	
A7	PB0/ ETH1_RXDV/ MTCLK…	Not assigned	–	
A8	PC0/ WAIT#/ ETH1_RXD2/…	Not assigned	–	

Pin Number / Pin Function /

If pins have multiple functions, User can select pin functions by configuring the "Selected Function". For example, when IRQ7 has not been set up in CG and user set A5 as IRQ7, the following warning is shown.

A5	PF7/ IRQ7/ A25/ ETH0_TX…	IRQ7	–	Function is not enabled in peripheral configuration.

After that, IRQ7 has been set in Peripheral Functions (Interrupt Controller), this warning is disappeared and IRQ7 is shown in Selected Function.

A5	PF7/ IRQ7/ A25/ ETH0_TX…	IRQ7	In	

Pin Function List

Pin Function List shows which pins are used by corresponding peripheral module. If multiple pins are selectable for a specific function, the allocation can be changed through this list.
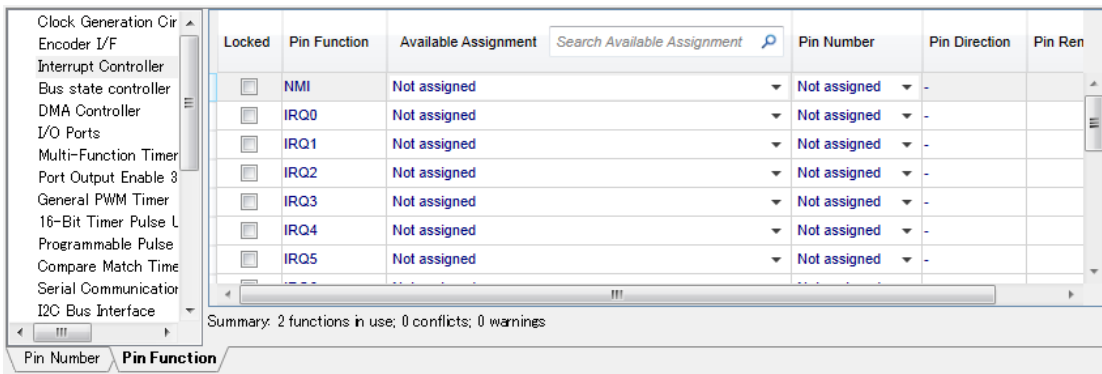
Pin Function List allows user to change a specific pin which has been to set by CG. For example, IRQ7 has been set by CG, an available pin are automatically set.

IRQ7	PF7/ IRQ7/ A25/ ETH0_TXE…	A5	In	

User can change the pin to another available pins by selection "Pin Assignment" or "Pin Number".

IRQ7	P97/ AN107/ IRQ7/ A25/ AD…	E18	In	

If a pin which has been already set as other function is selected, the warning is shown and the selected pin is not assigned.

IRQ7	Not assigned	Not assigned	In	Conflict detected in peripheral configuration.

Save Device List View

Clicking the icon above in Device List View, User can save the current pin settings as csv the format.

Lock Pin Settings

Clicking the icon above in Device List View, User can lock the current pin settings and be free of influence from other peripherals.

Generate Code

Clicking the icon above in Device List View, code generation can be executed.

Device Top View

Device Top View shows which pins are used by corresponding peripheral module in the package view. If pins have multiple functions, this view allows to user to configure the functions and if multiple pins selectable for a specific function, the allocation can be changed through this view.
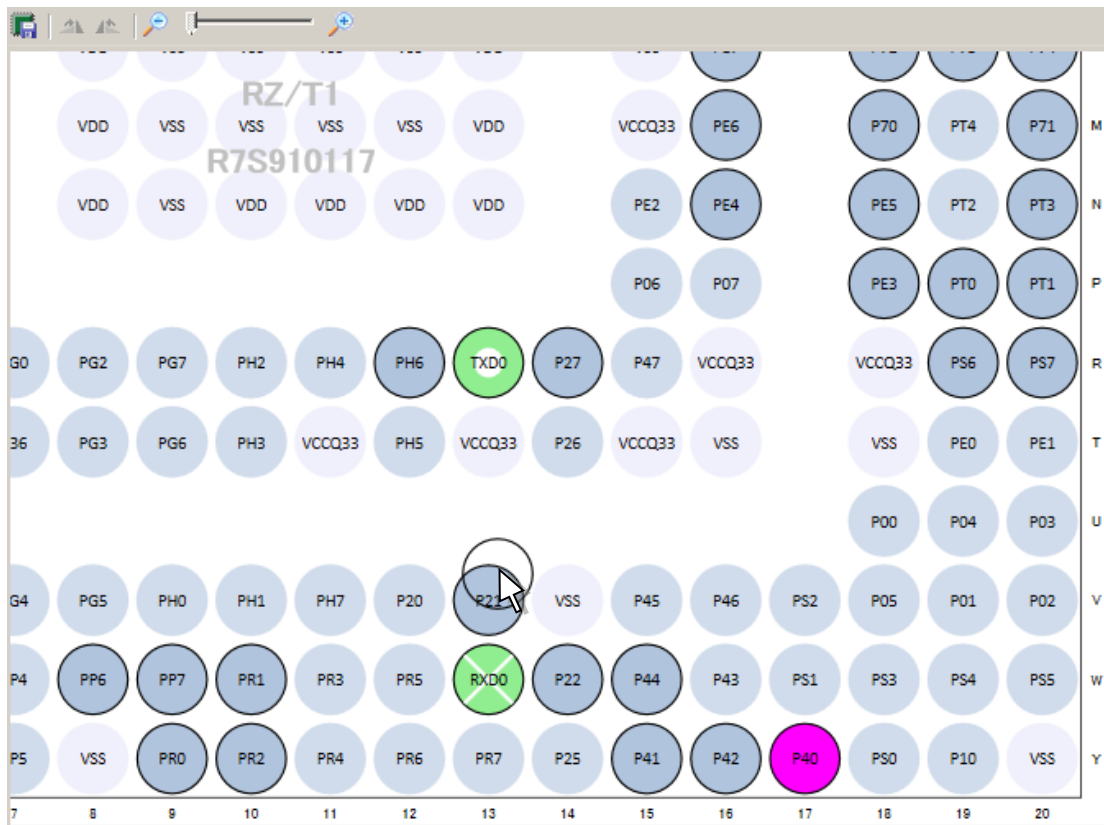
Highlight Pins by Peripheral

Device Top View highlights the group of pins that belongs to the active CG peripheral functions. The figure above shows Device Top View when Serial Communications Interface with FIFO is being selected by CG.

Assigned Pin (Input)

Shows assigned pins (Input).

Assigned pin (Output)

Shows assigned pins (Output).

Alternative pin selection

If user holds down the "CTRL" key and use mouse "left click" on the pin in use, the other pins with this same function will change color. For example, R13 is assigned to the function "TXD0", if user "CTRL + Click" to pin "TXD0", the pin Y17 (P40) changes color, because it contains the same function "TXD0". At the same time, while the "CTRL" key is hold down, if user drag and drops the pin to Y17 (P40). Y17 (P40) will be assigned to in use as "TXD0".

Zoom

Device Top View supports the zoom function by slider controls. After clicking the device top view, user can do this by mouse-wheel.

Drag and Move

Device Top View supports mouse drags actions. Hold down mouse left button on the view and move will drag the view around.

Save Device Top View

Clicking the icon above in Device Top View, User can save the view as PNG format.

Configure Pin View Color

Pin View supports for user to change color, through the property window.
Right click on the Device Top View on project tree, the property window will pop up a right click menu.

5.2.4 Cautions of Multiple Interrupts

AP4 for RZ is not supporting multiple interrupts.
 [Workaround] There is no workaround.

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