AP4 for RX V1.07.00
Release Note

R20UT3504EJ0100
Rev.1.00
Aug 05, 2015

Use AP4 for RX (The name was changed from Application Leading Tool for RX.), and thank you very much truly.

The restriction items for using this product, and notices, etc. are mentioned by these attached documents. Before using, I would like to ask you to read certainly.

Contents

Chapter 1. Introduction

The AP4 for RX is a software tool to generate device driver code for on-chip peripherals. It generates device driver codes using user settings through GUI. Initialize code and API functions are provided.

Chapter 2. Target Devices

Below is a list of devices supported by the AP4 for RX V1.07.00.

RX111 group	
PIN	Device name
36pin	R5F5111JAxLM, R5F51111AxLM, R5F51113AxLM
40pin	R5F5111JAxNF, R5F51111AxNF, R5F51113AxNF
48pin	R5F5111JAxFL, R5F5111JAxNE, R5F51111AxFL, R5F51111AxNE R5F51113AxFL, R5F51113AxNE, R5F51114AxFL ,R5F51114AxNE R5F51115AxFL, R5F51115AxNE, R5F51116AxFL, R5F51116AxNE R5F51117AxFL, R5F51117AxNE, R5F51118AxFL, R5F51118AxNE
64pin	R5F5111JAxFK, R5F5111JAxFM, R5F5111JAxLF R5F51111AxFK, R5F51111AxFM, R5F51111AxLF R5F51113AxFK, R5F51113AxFM, R5F51113AxLF R5F51114AxFK, R5F51114AxFM, R5F51114AxLF R5F51115AxFK, R5F51115AxFM, R5F51115AxLF R5F51116AxFK, R5F51116AxFM, R5F51116AxLF R5F51117AxFK, R5F51117AxFM, R5F51117AxLF R5F51118AxFK, R5F51118AxFM, R5F51118AxLF
Following documents.	
Manual Name	Document Number
RX111 Group User's Manual: Hardware	R01UH0365JJ0110
	R01UH0365EJ0110

RX110 group	
PIN	Device name
36pin	R5F5110HAxLM, R5F5110JAxLM, R5F51101AxLM, R5F51103AxLM
40pin	R5F5110HAxNF, R5F5110JAxNF, R5F51101AxNF, R5F51103AxNF
48pin	R5F5110JAxFL, R5F5110JAxNE, R5F51101AxFL, R5F51101AxNE R5F51103AxFL, R5F51103AxNE, R5F51104AxFL ,R5F51104AxNE R5F51105AxFL ,R5F51105AxNE
64pin	R5F5110JAxFK, R5F5110JAxFM, R5F5110JAxLF R5F51101AxFK, R5F51101AxFM, R5F51101AxLF R5F51103AxFK, R5F51103AxFM, R5F51103AxLF R5F51104AxFK, R5F51104AxFM, R5F51104AxLF R5F51105AxFK, R5F51105AxFM, R5F51105AxLF
Following documents.	
Manual Name	Document Number
RX110 Group User's Manual: Hardware	R01UH0421JJ0100
	R01UH0421EJ0100

RX64M group	
PIN	Device name
100pin	R5F56MFCxFP, R5F56MFCxLJ, R5F56MFDxFP, R5F56MFDxLJ R5F56MGCxFP, R5F56MGCxLJ, R5F56MGDxFP, R5F56MGDxLJ R5F56MJCxFP, R5F56MJCxLJ, R5F56MJDxFP, R5F56MJDxLJ R5F56MLCxFP, R5F56MLCxLJ, R5F56MLDxFP, R5F56MLDxLJ
144/145pin	R5F56MFCxFB, R5F56MFCxLK, R5F56MFDxFB, R5F56MFDxLK R5F56MGCxFB, R5F56MGCxLK, R5F56MGDxFB, R5F56MGDxLK R5F56MJCxFB, R5F56MJCxLK, R5F56MJDxFB, R5F56MJDxLK R5F56MLCxFB, R5F56MLCxLK, R5F56MLDxFB, R5F56MLDxLK
176/177pin	R5F56MFDxFC, R5F56MFDxBG, R5F56MFDxLC, R5F56MFCxFC R5F56MFCxBG, R5F56MFCxLC, R5F56MGDxFC, R5F56MGDxBG R5F56MGDxLC, R5F56MGCxFC, R5F56MGCxBG, R5F56MGCxLC R5F56MJDxFC, R5F56MJDxBG, R5F56MJDxLC, R5F56MJCxFC R5F56MJCxBG, R5F56MJCxLC, R5F56MLDxFC, R5F56MLDxBG R5F56MLDxLC, R5F56MLCxFC, R5F56MLCxBG, R5F56MLCxLC
Following documents.	
Manual Name	Document Number
RX64M Group User's Manual: Hardware	R01UH0377JJ0090
	R01UH0377EJ0090

RX113 Group	
Nickname	Device name
64pin	R5F51135AxLJ, R5F51136AxLJ, R5F51137AxLJ, R5F51138AxLJ
100pin	R5F51135AxFP, R5F51136AxFP, R5F51137AxFP, R5F51138AxFP R5F51135AxFM, R5F51136AxFM, R5F51137AxFM, R5F51138AxFM
Following documents.	
Manual Name	Document Number
RX113 Group User's Manual: Hardware	R01UH0448JJ0100
	R01UH0448EJ0100

RX71M Group	
PIN	Device name
100pin	R5F571MFDxFP, R5F571MFCxLJ, R5F571MFDxFP, R5F571MFDxLJ R5F571MGDxFP, R5F571MGDxLJ, R5F571MGCxFP, R5F571MGCxLJ R5F571MJDxFP, R5F571MJDxLJ, R5F571MJCxFP, R5F571MJCxLJ R5F571MLDxFP, R5F571MLDxLJ, R5F571MLCxFP, R5F571MLCxLJ
144/145pin	R5F571MFCxFB, R5F571MFCxLK, R5F571MFDxFB, R5F571MFDxLK R5F571MGCxFB, R5F571MGCxLK, R5F571MGDxFB, R5F571MGDxLK R5F571MJCxFB, R5F571MJCxLK, R5F571MJDxFB, R5F571MJDxLK R5F571MLCxFB, R5F571MLCxLK, R5F571MLDxFB, R5F571MLDxLK
176/177/178pin	R5F571MFDxFC, R5F571MFDxBG, R5F571MFDxLC, R5F571MFCxFC, R5F571MFCxBG, R5F571MFCxLC, R5F571MGDxFC, R5F571MGDxBG, R5F571MGDxLC, R5F571MGCxFC, R5F571MGCxBG, R5F571MGCxLC, R5F571MJDxFC, R5F571MJDxBG, R5F571MJDxLC, R5F571MJCxFC, R5F571MJCxBG, R5F571MJCxLC, R5F571MLDxFC, R5F571MLDxBG, R5F571MLDxLC, R5F571MLCxFC, R5F571MLCxBG, R5F571MLCxLC
Following documents.	
Manual Name	Document Number
RX71M Group User's Manual: Hardware	R01UH0493JJ0100
	R01UH0493EJ0100

RX23T Group	
PIN	Device name
48pin	R5F523T3AxFL, R5F523T5AxFL
52pin	R5F523T3AxFD, R5F523T5AxFD
64pin	R5F523T3AxFM, R5F523T5AxFM
Following documents.	
Manual Name	Document Number
RX23T Group User's Manual: Hardware	R01UH0520JJ0100
	R01UH0520EJ0100

RX230 Group	
PIN	Device name
48pin	R5F52305AxNE, R5F52306AxNE, R5F52305AxFL, R5F52306AxFL
64pin	R5F52305AxND, R5F52306AxND, R5F52305AxFM, R5F52306AxFM R5F52305AxLF , R5F52306AxLF
100pin	R5F52305AxLA, R5F52306AxLA, R5F52305AxFP, R5F52306AxFP
RX231 Group	
PIN	Device name
48pin	R5F52315AxNE, R5F52316AxNE, R5F52317AxNE, R5F52318AxNE R5F52315CxNE, R5F52316CxNE, R5F52317BxNE, R5F52318BxNE R5F52315AxFL, R5F52316AxFL, R5F52317AxFL, R5F52318AxFL R5F52315CxFL, R5F52316CxFL, R5F52317BxFL, R5F52318BxFL
64pin	R5F52315AxND, R5F52316AxND, R5F52317AxND, R5F52318AxND R5F52315CxND, R5F52316CxND, R5F52317BxND, R5F52318BxND R5F52315AxFM, R5F52316AxFM, R5F52317AxFM, R5F52318AxFM R5F52315CxFM, R5F52316CxFM, R5F52317BxFM, R5F52318BxFM R5F52315CxLF, R5F52316CxLF
100pin	R5F52315AxLA, R5F52316AxLA, R5F52317AxLA, R5F52318AxLA R5F52315CxLA, R5F52316CxLA, R5F52317BxLA, R5F52318BxLA R5F52315AxFP, R5F52316AxFP, R5F52317AxFP, R5F52318AxFP R5F52315CxFP, R5F52316CxFP, R5F52317BxFP, R5F52318BxFP

Following documents.

Manual Name	Document Number
RX230 Group, RX231 Group User's Manual: Hardware	R01UH0496JJ0100
	R01UH0496EJ0100

Chapter 3. Operating Environment

- Host machine
  - IBM PC/AT compatibles (Windows® 8.1, Windows® 8, 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 WindowsOS
    - .NET Framework version4.5
    - Microsoft Visual C++ 2010 SP1 runtime library

- Development Environments

Product Name	Version
IAR Embedded Workbench for Renesas RX	V2.80 or later *
GNURX	V15.01 or later
Renesas electronics Compiler for RX [CC-RX]	V2.03 or later

*: IAR Embedded Workbench for Renesas RX is not supported RX230 and RX231 Group at august 2015.

Chapter 4. Changes

This chapter describes change from AP for RX V1.06.00 to V1.07.00.

4.1 Changes List

No	Description	Version						
		RX110 V1.05.01.02	RX111 V1.05.01.02	RX113 V1.02.01.02	RX230, RX231 V1.00.00.03	RX23T V1.00.00.03	RX64M V1.02.01.02	RX71M V1.00.02.02
1	Eliminate of Data handled by polling	−	−	／	／	／	／	／
2	Changes of Clock Generator Setting	−	−	／	／	／	／	／
3	Addition of Pin View	−	−	／	／	／	−	／
4	Addition of API	／	／	−	／	−	／	／
5	Changes of TRGC and TRGD register setting	／	−	／	／	／	−	−
6	Changes of SCKCR2 register setting	／	／	／	／	／	−	／
7	Changes of BUS setting	／	／	／	／	／	−	／
8	Changes of SCI setting	−	−	−	／	／	−	−
9	Changes of MTIOC3D pin setting for MTU3 normal mode	／	／	／	／	／	−	／
10	Output code changes of Simple I2C bus (SCI)	／	−	−	／	−	−	−
11	Changes of Clock Generator Setting (PLL Circuit Operation)	／	−	−	／	−	／	／
12	Changes of an error is generated in the address output pins for the bus	／	／	／	／	／	−	−
13	Changes of a selection error is generated for the pin settings of TPU	／	／	／	／	／	−	−

○: Correspondence, ￣: Not correspondence (finish of correction), ／: Outside of function

4.2 Details of Changes

4.2.1 Change of Data handled by polling

The selection "Data handled by polling" was eliminated.

- Data processing settings for the serial communication interface (SCI)
- Data processing settings for the serial peripheral interface

This issue has been corrected in V1.01.00

4.2.2 Change of Clock Generator Setting

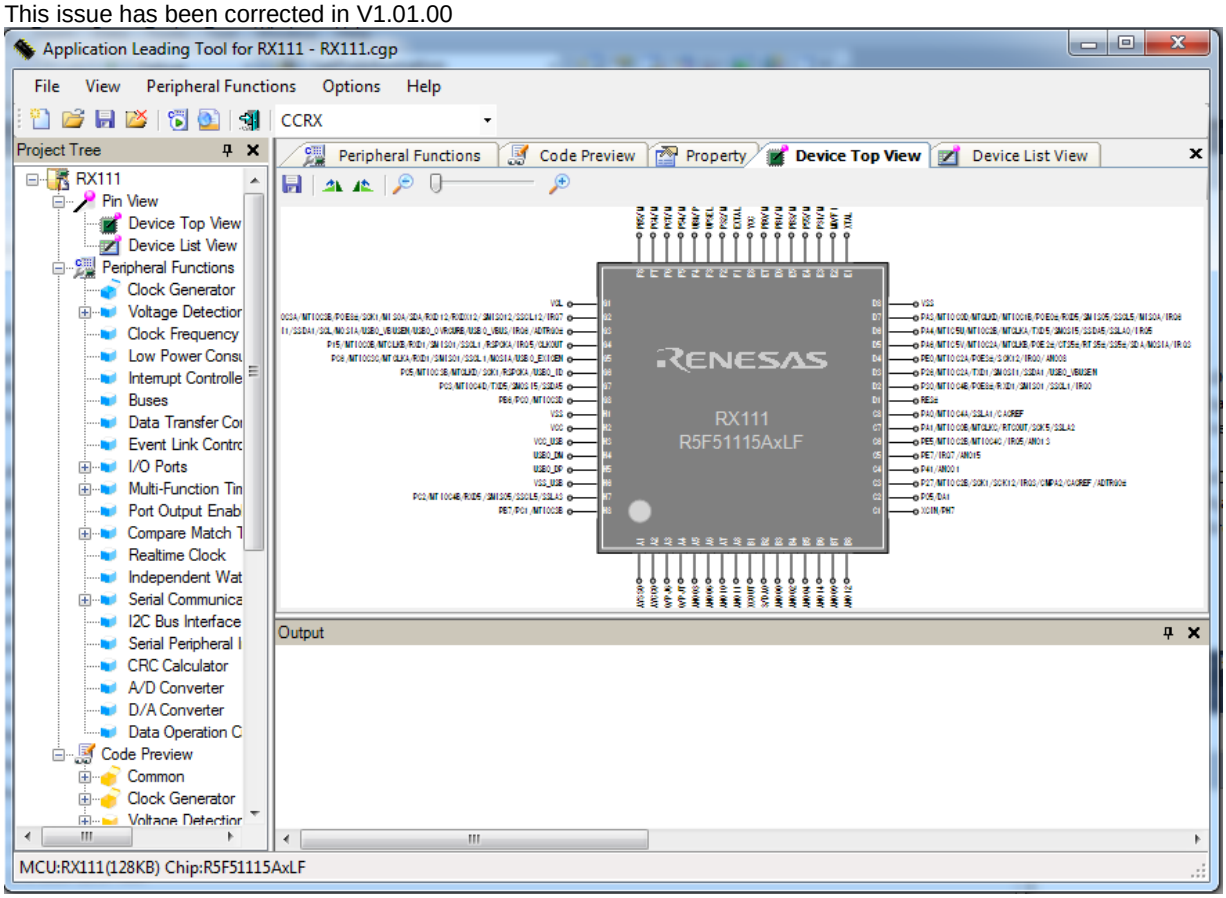
In the clock generator setting, it corrected so that the value exceeding restriction of a device could not be set up.

This issue has been corrected in V1.01.00

4.2.3 Addition of Pin View

PinView displays current pin settings by CodeGenerator. There are Device Top View and Device List View.

This issue has been corrected in V1.01.00



Rotate 

Device Top View supports rotate function. It allows user to rotate the Device Top View either in clockwise or anti-clockwise direction in steps of 90 degree.

Zoom 

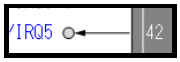
Device Top View supports zoom function. The zoom slider controls the zoom level.

Drag and Move

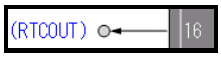
Device Top View supports mouse drags action. Hold down mouse left button on the graph and move will drag the graph around.

Highlight Pins by Peripheral

Device Top View will highlight the group of pins that belongs to the active CG peripheral (macro).

Input / Output (I/O) Direction Display 

Device Top View supports I/O direction of each pin. Input/output direction is indicated by an arrow.

Pin Label Color Highlight 

When pin label is displayed in blue color and indicated with parenthesis, it refers to pin function is configured in CodeGenerator.

Device Top View Output File 

Click on the “Save Device Top View” button on Device Top View toolbar, the Device Top View is saved as an image file, in PNG format.

Configure PinView Color in Property Window

PinView supports for user to change color, through the property window.

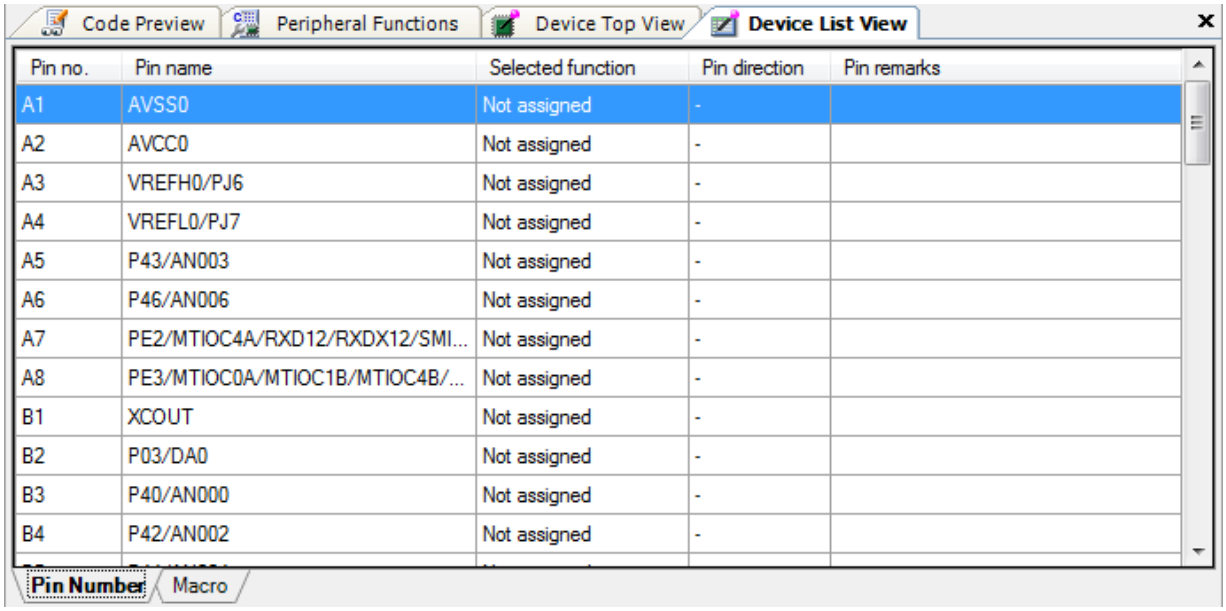
Right click on the Device Top View on project tree, the property window will pop up a right click menu.

Device List View

Device List view displays the pin information in a data grid format. It has two data lists: ‘Pin Number’ and ‘Macro’. Both lists refer to the same pin configuration as shown on the Device Top View.

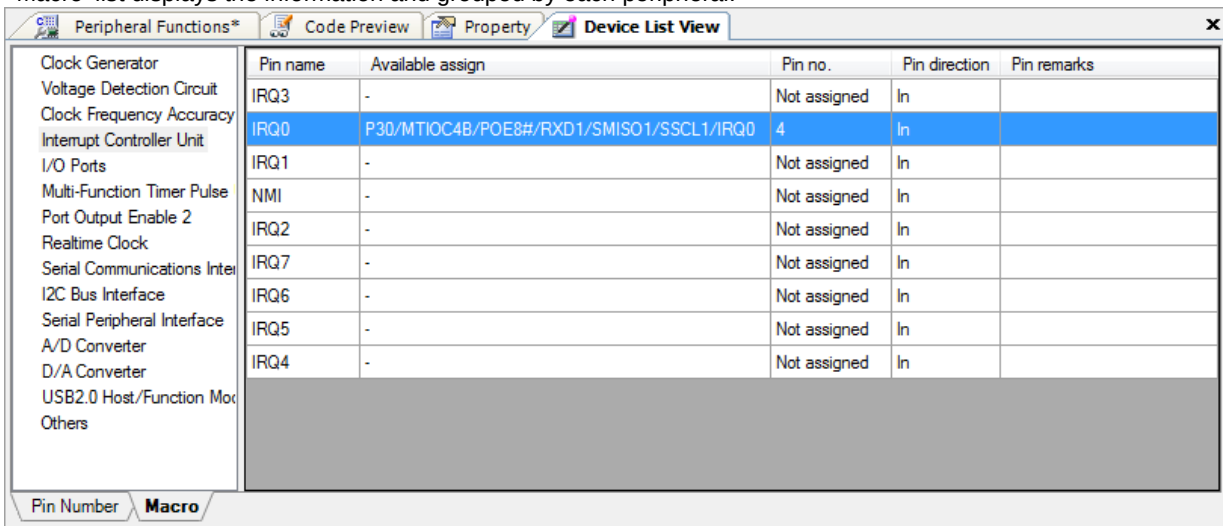
Pin Number List Window

Pin Number list displays current pins configuration pin number.



Macro List Window

'Macro' list displays the information and grouped by each peripheral.



4.2.4 Addition of API

API was added to RX113. Please refer to the end of a book of a release note for API specification.

This issue has been corrected in V1.04.00.

API was added to RX23T. Please refer to the end of a book of a release note for API specification.

This issue has been corrected in V1.06.00.

4.2.5 Changes of TRGC and TRGD register setting

In some cases, required code for setting the TGRC and TGRD registers is not output to the create function that is generated in response to setting up the multi-function timer pulse unit (MTU) or 16-bit timer pulse unit (TPU).

This issue has been corrected in AP4 for V1.05.00

4.2.6 Change of SCKCR2 register setting

There is an error in the output code of the void R_CGC_Create(void) function, which is in the r_cg_cgc.c source file for clock settings. In writing a value to system clock control register 2 (SCKCR2), bit 0 is erroneously set to "0". The correct setting for bit 0 is "1".

This issue has been corrected in AP4 for V1.05.00

4.2.7 Change of BUS setting

When setting a separate bus in the interface for bus area settings,the address latch signal (ALE) has to be enabled.The use of a separate bus was originally selectable regardless of the ALE setting.

This issue has been corrected in AP4 for V1.05.00

4.2.8 Change of SCI setting

The output cord when choosing a simple SPI bus by SCI and carrying out cord generation, isn't right. When the R_SCIn_Stop (void) function is carried out, even if the R_SCIn_Start (void) function is carried out, it can't be received.

This issue has been corrected in AP4 for V1.05.00

4.2.9 Changes of MTIOC3D pin setting for MTU3 normal mode

When the MTU3 is set with the following conditions, the code generated for port settings is not correct.

- Applicable channel: MTU3
- Function setting: Normal mode
- TGRD3: Output compare register
- Output of MTIOC3D pin: PC4

This issue has been corrected in AP4 for RX V1.06.00.

4.2.10 Output code changes of Simple I2C bus (SCI)

When the SCI is set with the following conditions, the generated handler code will not be correct. In master reception, the data reception clock is generated for an extra byte. The extra received data are not stored at the designated address.

- Applicable channel: All
- Function setting: Simple I2C bus
- I2C interrupt mode select: Use the reception and transmission interrupts.

This issue has been corrected in AP4 for RX V1.06.00.

4.2.11 Changes of Clock Generator Setting (PLL Circuit Operation)

When "Operation" is selected under "PLL circuit setting" on the "Clock Generator" page, the generated code has an error.

This issue has been corrected in AP4 for RX V1.06.00.

4.2.12 Changes of an error is generated in the address output pins for the bus

An error is generated in the address output pins "A16-A23" when the following address output pin settings are made for the bus.

(1) "P71" is selected as the CS1#output pin after checking "Use CS1" with the bus operation setting "Used".

(2) After selecting "Normal mode" for TPU1 in the 16-bit timer pulse unit settings, "P14" is enabled and set as the TCLKA pin.

(3) General registers TGRA1 and TGRB1 of TPU1 are set as "Output compare register", after which pins TIOCA1 and TIOCB1 are set to "output disabled".

(4) The address output pin settings for the bus are made.

This issue has been corrected in AP4 for RX V1.06.00.

4.2.13 Changes of a selection error is generated for the pin settings of TPU

A selection error is generated for the TIOCA1 pin of TPU1 of the 16-bit timer pulse unit when the following settings for the unit are made.

(1) TPU1 of the 16-bit timer pulse unit is set to "Phase counting mode 1", a check mark is placed against "TCLKA pin", and "P14" is selected as the TCLKA pin.

(2) The TIOCA1 and TIOCB1 pins of TPU1 are set to "Input capture at TPU0.TGRn input capture/compare match".

(3) MTU0 of the Multifunction Timer Pulse Unit 3 is set to "Normal mode" and a check mark is placed against "MTCLKA pin".

This issue has been corrected in AP4 for RX V1.06.00.

Chapter 5. Cautions

This section describes cautions for using the AP4 for RX V1.07.00.

5.1 Cautions List

No	Description	version						
		RX110 V1.05.01.02	RX111 V1.05.01.02	RX113 V1.02.01.02	RX230, RX231 V1.00.00.03	RX23T V1.00.00.03	RX64M V1.02.01.02	RX71M V1.00.02.02
1	Cautions of USB.	／	○	／	○	／	○	○
2	Cautions of online Help	○	○	○	○	○	○	○
3	Cautions of the IAR Embedded Workbench for Renesas RX V2.42.1	○	○	○	／	／	／	／
4	Cautions of Serial Communications Interface Asynchronous Mode	○	○	○	○	○	○	○
5	Cautions of Low Power Consumption	○	○	○	○	○	○	○
6	Cautions of User boot mode	／	／	／	／	／	○	○
7	Cautions of extension code and multi-master of RIIC	／	／	○	○	○	○	○
8	Cautions of Clock Edge Select of MTU	／	／	／	／	○	／	／
9	Cautions of triggers to start conversion by the A/D converter of MTU	／	／	／	／	○	／	／
10	Output code cautions of POE	／	／	／	／	○	／	／
11	Cautions of I/O Ports function	／	／	／	○	／	／	／
12	Caution of setting of pins, which are multiplexed with PORTH	／	／	／	○	／	／	／
13	Caution of display of PinView	／	／	／	○	／	／	／
14	Cautions of the supported device of IAR Embedded Workbench for Renesas RX	／	／	／	○	／	／	／

○: Correspondence, ／: Outside of function

5.2 Cautions Details

5.2.1 Cautions of USB

AP4 for RX is not supporting the USB.
[Workaround] There is no workaround.

5.2.2 About online Help

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

5.2.3 About the IAR Embedded Workbench

In case of IAR Embedded Workbench for Renesas RX V2.42.1, the following functions cause build error.

- Setting of High-speed On-chip Oscillator
- Setting of I/O Port (PORTH and PORTJ)

[Workaround]

Setting of High-speed On-chip Oscillator

Comment out generated line `SYSTEM.HOCOWTCR.BYTE = xxxx;` in a function `void R_CGC_Create(void)`

Example

```
void R_CGC_Create(void)
{


    /* Set HOCO wait time */
    SYSTEM.HOCOWTCR.BYTE = _06_CGC_HOCO_WAIT_CYCLE_266;    // This line

}
```

Setting of I/O port (PortH and PortJ)

There is no workaround.
Please use the IAR Embedded Workbench for Renesas RX V2.42.2 or later.

5.2.4 Cautions of Serial Communications Interface Asynchronous Mode

AP4 is Asynchronization Mode of SCI and is not supporting the MTU clock input.
[Workaround] There is no workaround.

5.2.5 Cautions of Low Power Consumption

AP4 for RX is not supporting Low Power Consumption.
[Workaround] There is no workaround.

5.2.6 Cautions of User boot mode

AP4 for RX is not supporting User boot mode.
[Workaround] There is no workaround.

5.2.7 Cautions of extension code and multi-master of RIIC

The code generator is not supporting the extension code, multi-master function of RIIC.

[Workaround] There is no workaround.

5.2.8 Caution Cautions of Clock Edge Select of MTU

When PCLK is selected of MTU Clock source for counting, Clock Edge Select can't be selected.

[Workaround] Add setting Timer Control Register (TCR) to the generated source programs.

5.2.9 Cautions of triggers to start conversion by the A/D converter of MTU

When the triggers to start conversion by the A/D converter is selected, the source program may not be generated by the error.

[Workaround] There is no workaround.

5.2.10 Output code cautions of POE

When MTIOC0B pin is set to MTIOC0B P93 Pin High-Impedance of POE, the generated code has an error.

[Workaround] Modify the output code in the way shown below.

Before modification:

```
POE.POECR1.BYTE = _40_POE_MTIOC0CPINP93_ENABLE | _0000_POE_POECR1_DEFAULT;
```

After modification:

```
POE.POECR1.BYTE = _40_POE_MTIOC0BPINP93_ENABLE | _0000_POE_POECR1_DEFAULT;
```

5.2.11 Cautions of I/O Ports function

PORTJ cannot be used with open-drain setting. (Port J pins are not present in 100 or fewer pin package products of the RX230 and RX231 group.)

[Workaround] Add setting for the Open Drain Control Register 0 (ODR0) of PORTJ.

5.2.12 Caution of setting of pins, which are multiplexed with PORTH

When selected the products of RX230 group, cannot be setting of pins; PH0/CACREF, PH1/IRQ0/TMO0, PH2/IRQ1/TMRI0, PH3/TMCI0.

(I/O Port settings and the peripheral functions, which are multiplexed port H.)

[Workaround] Add code for settings PORTH.

5.2.13 Caution of display of Pinview

When the following products is selected, PinView is not displayed.

RX231 group
48pin:R5F52315CxNE, R5F52316CxNE, R5F52315CxFL, R5F52316CxFL
64pin:R5F52315CxND, R5F52316CxND, R5F52315CxFM, R5F52316CxFM, R5F52315CxLF, R5F52316CxLF
100pin:R5F52315CxLA, R5F52316CxLA, R5F52315CxFP, R5F52316CxFP

[Workaround] There is no workaround.

5.2.14 Cautions of the supported device of IAR Embedded Workbench for Renesas RX

IAR Embedded Workbench for Renesas RX (V2.80) is not supported RX230 and RX231 Group at August 2015.

[Workaround] There is no workaround.

Chapter 6. About API added and changed

6.1 About API added for RX113

API Function Name	Function
R_CMPB_Create	Performs initialization necessary to control the Comparator B.
R_CMPB_Create_UserInit	Performs user-defined initialization relating to the Comparator B.
r_cmpb_cmpb*n*_interrupt	Performs processing in response to the comparator B interrupt.
R_CMPB*n*_Start	Starts comparison for analog input voltage.
R_CMPB*n*_Stop	Ends comparison for analog input voltage.

Comparator B (CMPB)

R_CMPB_Create

Performs initialization necessary to control the Comparator B.

[File Name]

r_cg_cmpb.c

[Syntax]

```
void R_CMPB_Create ( void );
```

[Argument(s)]

None.

[Return value]

None.

R_CMPB_Create_UserInit

Performs user-defined initialization relating to the Comparator B.

Remark This API function is called as the R_CMPB_Create callback routine.

[File Name]

r_cg_cmpb_user.c

[Syntax]

```
void R_CMPB_Create_UserInit ( void );
```

[Argument(s)]

None.

[Return value]

None.

r_cmpb_cmpb*n*_interrupt

Performs processing in response to the comparator B interrupt.

Remark This API function is called to run interrupt processing for the comparator B*n* interrupt, which is generated when the comparison result changes at this time.

[File Name]

r_cg_cmpb_user.c

[Syntax]

```
Void r_cmpb_cmpbn_interrupt ( void );
```

Remark *n* is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPB*n*_Start

Starts comparison for analog input voltage

Starts D/A conversion.

[File Name]

r_cg_cmpb.c

[Syntax]

```
void R_CMPBn_Start ( void );
```

Remark *n* is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPB*n*_Stop

Ends comparison for analog input voltage.

[File Name]

r_cg_cmpb.c

[Syntax]

```
void R_CMPBn_Stop ( void );
```

Remark *n* is the channel number.

[Argument(s)]

None.

[Return value]

None.

6.2 About API added for RX23T

API Function Name	Function
R_CMPC_Create	Performs initialization necessary to control the Comparator C.
R_CMPC_Create_UserInit	Performs user-defined initialization relating to the Comparator C.
r_cmpc_cmpc*n*_interrupt	Performs processing in response to the comparator C interrupt.
R_CMPC*n*_Start	Starts comparison for analog input voltage.
R_CMPC*n*_Stop	Ends comparison for analog input voltage.

Comparator C (CMPC)

R_CMPC_Create

Performs initialization necessary to control the Comparator C.

[File Name]

r_cg_cmpc.c

[Syntax]

```
void R_CMPC_Create ( void );
```

[Argument(s)]

None.

[Return value]

None.

R_CMPC_Create_UserInit

Performs user-defined initialization relating to the Comparator C.

Remark This API function is called as the R_CMPC_Create callback routine.

[File Name]

r_cg_cmpc_user.c

[Syntax]

```
void R_CMPC_Create_UserInit ( void );
```

[Argument(s)]

None.

[Return value]

None.

r_cmpc_cmpc*n*_interrupt

Performs processing in response to the comparator C interrupt.

Remark This API function is called to run interrupt processing for the comparator C*n* interrupt, which is generated when the comparison result changes at this time.

[File Name]

r_cg_cmpc_user.c

[Syntax]

```
Void r_cmpc_cmpcn_interrupt ( void );
```

Remark *n* is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPC*n*_Start

Starts comparison for analog input voltage

Starts D/A conversion.

[File Name]

r_cg_cmpc.c

[Syntax]

```
void R_CMPCn_Start ( void );
```

Remark *n* is the channel number.

[Argument(s)]

None.

[Return value]

None.

R_CMPC*n*_Stop

Ends comparison for analog input voltage.

[File Name]

r_cg_cmpc.c

[Syntax]

```
void R_CMPCn_Stop ( void );
```

Remark *n* is the channel number.

[Argument(s)]

None.

[Return value]

None.

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