

**Contents**

Chapter 1. Target Devices .....	2
Chapter 2. User's Manuals .....	3
Chapter 3. Range .....	4
Chapter 4. Simulation of Peripheral Functions.....	5
4.1 Timer .....	5
4.2 Interrupt Controller.....	6
4.3 Memory Protection Unit.....	7
Chapter 5. Changes .....	8
5.1 Support of RX100.....	8
Chapter 6. Cautions.....	9
6.1 Caution of time measurement on return out.....	9
6.2 Caution of property panel .....	9
6.3 Caution on tracing within ranges as desired .....	9
6.4 Caution on measuring time within ranges as desired .....	9
6.5 Cautions Regarding the Simulator for RX100 .....	10
6.6 Caution Regarding Access to External Memory .....	10

## Chapter 1. Target Devices

CubeSuite+ Simulator for RX supports both simulation of RX CPU core and simulation of timer.

Below is a list of devices supported by this simulator.

Nickname	Device name
RX600	RX600 series
RX200	RX200 series
RX100	RX100 series

## Chapter 2. User's Manuals

Please read the following user's manuals together with this document.

Manual Name	Document Number
CubeSuite+ Ver.1.03.00 RX Debug	R20UT2350EJ0100
CubeSuite+ Ver.2.00.00 Message	R20UT2448EJ0100

## Chapter 3. Range

This section describes the functions of the RX simulator debugger.

(1) The simulator/debugger supports the following functions:

- All CPU instructions
- Exception processing
- Registers
- All address space
- Peripheral function (Timer, Memory Protection Unit)

(3) The simulator/debugger does not support the following RX functions.

No.	Item	Remarks
1	Low power state	Simulation is stopped on the execution of a WAIT instruction.
2	Non-maskable interrupt (NMI)	
3	Reception of an interrupt during execution of any of the following instructions: (RMPA, SCMPU, SMOVF, SMOVB, SMOVU, SSTR, SUNTIL, SWHILE)	The interrupt is accepted when execution of the instruction is completed.
4	Values in memory and registers that become undefined after the execution of instructions	
5	Lower-order 16 bits of the accumulator (ACC)	A simulator debugger returns 0.

## Chapter 4. Simulation of Peripheral Functions

This section describes the peripheral functions of simulator debugger.

### 4.1 Timer

#### (1) Supported Range

The simulator debugger supports a total of four compare match timer (CMT) channels, i.e. two CMT units (unit 0 and unit 1), each with two 16-bit timers.

#### (2) Control Registers

Below is a list of registers supported by this simulator.

A control register please access it at register size by all means.

Unit	Supported Control Register	Support
Unit0	CMSTR0	YES
	CMCR0, CMCR1	YES
	CMCNT0, CMCNT1	YES
	CMCOR0, CMCOR1	YES
Unit1	CMSTR1	YES
	CMCR2, CMCR3	YES
	CMCNT2, CMCNT3	YES
	CMCOR2, CMCOR3	YES

Note: YES Supported

## 4.2 Interrupt Controller

(1) Supported Range

The simulator debugger supports the interrupt controller unit (ICU) that is related to the CMT and SCI. The ICU can convey interrupts to the CPU but cannot activate the DTC or DMAC.

(2) Control Registers

Below is a list of registers supported by this simulator.

A control register please access it at register size by all means.

Supported Control Register	Support
IRn (n=028~029)	YES
IER03	NO
IPRm (m=04~07)	YES
FIR	YES

Note: YES Supported, NO Supported only CMT function

### 4.3 Memory Protection Unit

- (1) Supported Range  
The simulator debugger supports the Memory Protection Unit(MPU).
- (2) Control Registers  
Below is a list of registers supported by this simulator.

A control register please access it at register size by all means.

Supported Control Register	Support
RSPAGEn (n=0~7)	YES
REPAGEn (n=0~7)	YES
MPEN	YES
MPBAC	YES
MPECLR	YES
MPESTS	YES
MPDEA	YES
MPSA	YES
MPOPS	YES
MPOPI	YES
MHITI	YES
MHITD	YES

Note: YES Supported

## Chapter 5. Changes

This chapter describes changes from V2.02.00 to V2.02.01 of RX simulator.

### 5.1 Support of RX100

## Chapter 6. Cautions

This section describes cautions for using the RX simulator debugger.

### 6.1 Caution of time measurement on return out

#### (1) Run-Break timer

When return out is measured by run break timer, only the last instruction is measured. So the total execution time, Number of execution cycle and number of execution instructions are displayed the measurement of the last instruction.

#### (2) Trace

When specifying [Yes] in [Accumulate trace time] for using trace function, last instruction in return out execution is not added.

### 6.2 Caution of property panel

ROM Installed size to display in a tab [setting for connection] on a property panel becomes the value that added a ROM Installed domain and size displaying to in memory classification of memory mapping.

On this account display the value that was different from the ROM Installed size that chose at the time of project making.

### 6.3 Caution on tracing within ranges as desired

When tracing starts with an execution-related event, the simulator collects execution-history data from the address of the instruction immediately before the address of the start event. When tracing ends with an execution-related event, the simulator collects execution-history data up to the address of the instruction immediately before the address of the end event.

### 6.4 Caution on measuring time within ranges as desired

When time measurement ends with an execution-related event, the simulator measures execution time up to the address of the instruction immediately before the address of the end event.

## 6.5 Cautions Regarding the Simulator for RX100

### (1) System clock (ICLK) frequency

The default value of ICLK is 50 MHz. Before connecting the simulator, select the [Connect Settings] tabbed page on the Property panel of [RX Simulator(Debug Tool)] and specify a desired value for [System clock (ICLK) frequency[MHz]] in the [Clock] category.

### (2) Configuration of the compare match timer (CMT)

CMT consists of two units and four channels. The number of units and channels to be used must not exceed the configuration of the actual device.

## 6.6 Caution Regarding Access to External Memory

External memory is not selectable for [Memory type]. If you are using external memory with a ROM-less device, for example, add either [Emulation ROM area] or [Emulation RAM area] instead to [Memory Mappings] on the Property panel. Reading from or writing to an emulation ROM area or emulation RAM area takes one cycle.

All trademarks and registered trademarks are the property of their respective owners.

## Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
  2. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
  3. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
  4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
  5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.  
"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots etc.  
"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment etc.  
Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application for which it is not intended. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for which the product is not intended by Renesas Electronics.
  6. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
  7. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or systems manufactured by you.
  8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
  9. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You should not use Renesas Electronics products or technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. When exporting the Renesas Electronics products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
  10. It is the responsibility of the buyer or distributor of Renesas Electronics products, who distributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, Renesas Electronics assumes no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
  11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
  12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.
- (Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.  
(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.



### SALES OFFICES

Renesas Electronics Corporation

<http://www.renesas.com>

Refer to "<http://www.renesas.com/>" for the latest and detailed information.

#### **Renesas Electronics America Inc.**

2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.  
Tel: +1-408-588-6000, Fax: +1-408-588-6130

#### **Renesas Electronics Canada Limited**

1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada  
Tel: +1-905-898-5441, Fax: +1-905-898-3220

#### **Renesas Electronics Europe Limited**

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.  
Tel: +44-1628-651-700, Fax: +44-1628-651-804

#### **Renesas Electronics Europe GmbH**

Arcadiastrasse 10, 40472 Düsseldorf, Germany  
Tel: +49-211-65030, Fax: +49-211-6503-1327

#### **Renesas Electronics (China) Co., Ltd.**

7th Floor, Quantum Plaza, No.27 ZhichunLu Haidian District, Beijing 100083, P.R.China  
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

#### **Renesas Electronics (Shanghai) Co., Ltd.**

Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China  
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

#### **Renesas Electronics Hong Kong Limited**

Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong  
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

#### **Renesas Electronics Taiwan Co., Ltd.**

13F, No. 363, Fu Shing North Road, Taipei, Taiwan  
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

#### **Renesas Electronics Singapore Pte. Ltd.**

80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre Singapore 339949  
Tel: +65-6213-0200, Fax: +65-6213-0300

#### **Renesas Electronics Malaysia Sdn.Bhd.**

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

#### **Renesas Electronics Korea Co., Ltd.**

11F., Samik Lavied' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea  
Tel: +82-2-558-3737, Fax: +82-2-558-5141