User's Manual

For the latest information on operating environments refer to the page below.
http://www.renesas.com/qs+osp_env

CubeSuite+

Partner OS Aware Debugging Plug-in

User's Manual

Target Device
RL78 Family
RX Family

Renesas Electronics
www.renesas.com

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How to Use This Manual

Readers

This manual is intended for users who are using RL78 Family and RX Family in the design and development of application systems.

Purpose

This manual is intended to bring users to understand the functions of the CubeSuite+ Partner OS Aware Debugging Plug-in, and its organization is as listed below.

Organization

This manual consists of the following major sections.

How to Read This Manual

It is assumed that the readers of this manual have general knowledge in the fields of electrical engineering, logic circuits, microcontrollers, the C language, and assembly languages.

To understand the hardware functions of the RL78 Family or RX Family
-> Refer to the **User's Manual** for the given product.

Conventions

Data significance:	The higher-order digits are to the left and the lower-order digits are to the right
Note:	Footnotes for items marked with "Note" in the text
Caution:	Information requiring particular attention
Remark:	Supplementary information
Numeric representation:	Decimal XXXX
	Hexadecimal 0xXXXX

Prefixes indicating powers of 2 (for address spaces and memory capacities):

K (kilo) $2^{10} = 1024$
M (mega) $2^{20} = 1024^2$

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CHAPTER 1 GENERAL

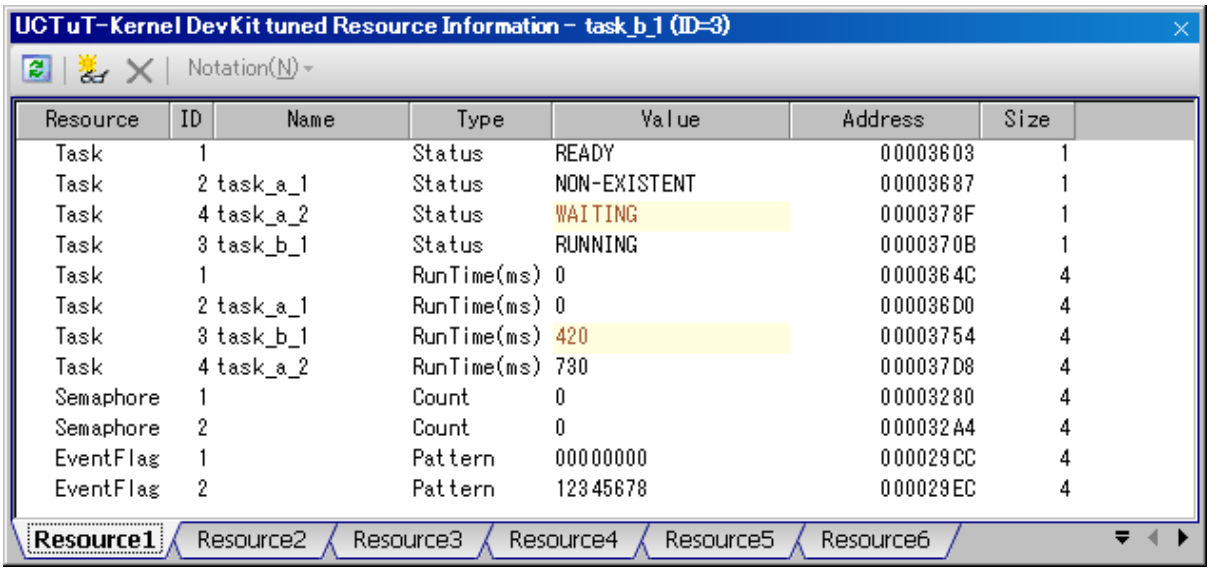
CubeSuite+ is an integrated development environment for use in tasks such as design, coding, building and debugging in the development of application systems for microcontrollers manufactured by Renesas Electronics.

This manual describes the tool, which is useful for debugging programs that employ real-time OS from a Renesas partner functionality within this integrated program-development process.

1.1 Overview

The Partner OS Aware Debugging Plug-in is an optional product for extending the debugging capabilities of CubeSuite+, and is only for use within CubeSuite+. When debugging a program that has real-time OS functionality, the resource information tool of Partner OS Aware Debugging Plug-in can be used to confirm information on real-time OS resources (i.e. system information and task information) that change dynamically over time during program execution.

Figure 1-1. CubeSuite+ Partner OS Aware Debugging Plug-in



Resource	ID	Name	Type	Value	Address	Size
Task	1		Status	READY	00003603	1
Task	2	task_a_1	Status	NON-EXISTENT	00003687	1
Task	4	task_a_2	Status	WAITING	0000378F	1
Task	3	task_b_1	Status	RUNNING	0000370B	1
Task	1		RunTime(ms)	0	000036AC	4
Task	2	task_a_1	RunTime(ms)	0	000036D0	4
Task	3	task_b_1	RunTime(ms)	420	00003754	4
Task	4	task_a_2	RunTime(ms)	730	000037D8	4
Semaphore	1		Count	0	00003280	4
Semaphore	2		Count	0	000032A4	4
EventFlag	1		Pattern	00000000	000029CC	4
EventFlag	2		Pattern	12345678	000029EC	4

1.2 Features

The features of the CubeSuite+ Partner OS Aware Debugging Plug-in are listed below.

- Information from the CubeSuite+ Partner OS Aware Debugging Plug-in can be used to confirm information on resources
  The Resource Information pane of the Partner OS Aware Debugging Plug-in displays the current states of resource information for programs running within the debugging tool.

1.3 Operation Environment

The features of the CubeSuite+ Partner OS Aware Debugging Plug-in are listed below.

- Real-time operating systems

For the latest information on operating environments refer to the page below.
http://www.renesas.com/qs+osp_env

Table 1-1. Supported Real-Time Operating Systems

Real-time OS	RL78 Family	RX Family	Version
uC/OS-III from Micrium, Inc.	-	x	V3.02
embOS from SEGGER Microcontroller Systems.	-	x	Version 3.84
UCT uT-Kernel DevKit tuned for RX62N-CubeSuite+ from Ubiquitous Computing Technology Corporation	-	x	Version 1.01.01
NORTi from MiSPO Co., Ltd.	-	x	Version 4 Release 4.4
Smalight OS from Renesas Northern Japan Semiconductor, Inc.	x	x	V3.10

- Integrated Development Environment
  CubeSuite+ V1.03

- Debugger
  Simulator, on-chip debugging emulator (E1, E20)

- Compilers
  Compilers from Renesas Electronics Corporation

- PC
  PC running on Windows 7(R), Windows Vista(R), Windows(R) XP
  Other conditions comply with the operating environment of CubeSuite+.

CHAPTER 2 FUNCTIONS

This chapter describes the key functions provided by the Partner OS Aware Debugging Plug-in along with the operating procedures.

(1) Start CubeSuite+

Launch CubeSuite+ from the [Start] menu of Windows.

(2) Opening a project

Open the project for debugging.

(3) Selecting the debugging tool

Select the type of debugging tool with which to debug the program.

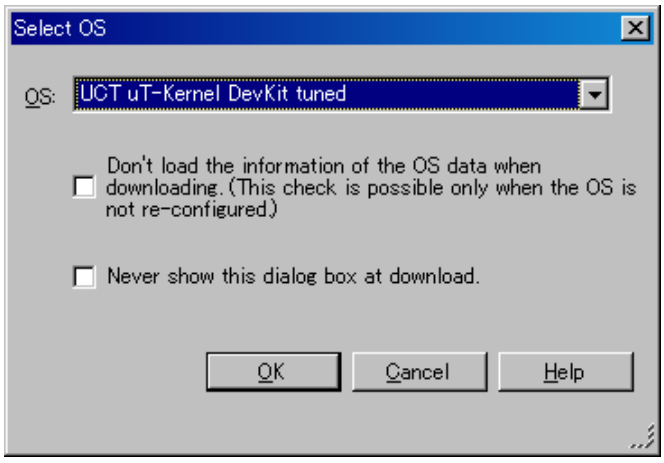
(4) Downloading a program

Download the program for debugging.

(5) Selecting the real-time OS

When a program is downloaded, the [Select OS] Dialog Box is automatically displayed. At this time, select the real-time OS you are using.

Figure 2-1. [Select OS] Dialog Box



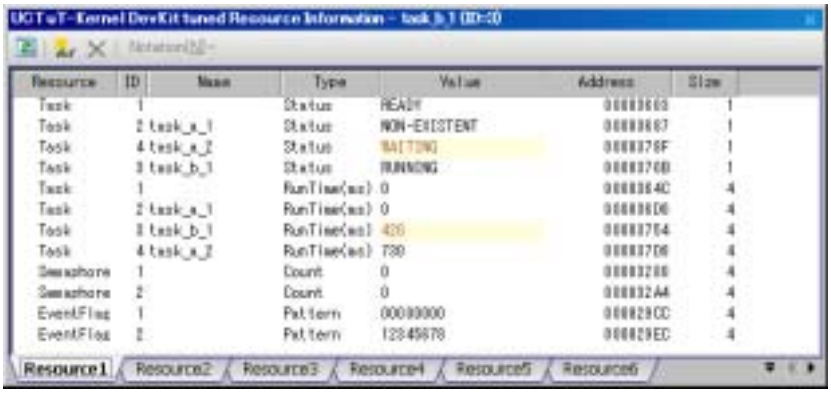
(6) Executing/stopping a program

Run the program and then stop it at the location for which you wish to display resource information from the CubeSuite+ Partner OS Aware Debugging Plug-in.

(7) Confirm the Resource Information from the Partner OS Aware Debugging Plug-in

Select [View] menu -> [Realtime OS] -> [Resource Information] to open the Resource Information pane.

Figure 2-2. [Resource Information] Pane



Remark For details on working with CubeSuite+, refer to the user's manual or help system for CubeSuite+.

APPENDIX A WINDOW REFERENCE

A.1 Description

The pane for the Partner OS Aware Debugging Plug-in is described.

Table A-1. Pane for the Plug-in

Name of Pane	Description
Resource Information pane	This pane displays information on the usage of resources (i.e. system information and task information) by the real-time OS.

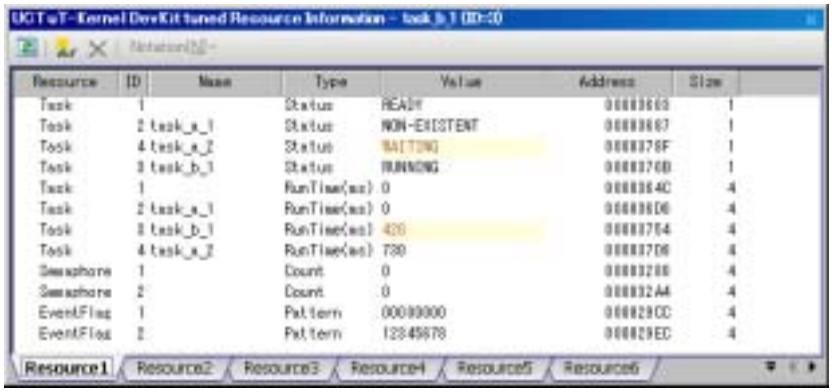
Resource Information pane

This pane displays information on the usage of resources (i.e. system information and task information) by the real-time OS.

Add further items for display as required by selecting [Add new resource] in the context menu.

Items that can be displayed vary according to the real-time OS.

Figure A-1. [Resource Information] Pane



The following items are explained here.

- Opening the pane
- Displayed items
- [File] Menu
- [Edit] Menu
- Context Menu

Opening the pane

- From the [View] menu, select [Realtime OS]->[Resource Information].

Displayed items

Name of Header	Description
Resource	Resource type (e.g. Task, Semaphore)
ID	Resource ID
Name	Symbolic name of the address where a task or handler starts, or the name of a resource
Type	Type of resource information, such as "status" and the number of resources
Value	Value of resource information
Address	Address where the value is stored
Size	Size of the value

[File] Menu

When the [File] menu of CubeSuite+ is selected while the resource information pane is active, the following items are displayed for the Resource Information pane.

Name of Menu	Description
Save Resource Data	Save the data in the text file (*.txt) in which the context of the pane was previously saved. Note that when this item is selected for the first time after booting-up, the operation is the same as when selecting [Save Resource Data As ...]. This item is invalid while the program is running.
Save Resource Data As ...	Selecting this item opens [Save as ...] dialog box for saving the context of the pane in a specified text file (*.txt). This item is invalid while the program is running.

[Edit] Menu

When the [Edit] menu of CubeSuite+ is selected while the resource information pane is active, the following items are displayed in the resource information pane.

Name of Menu	Description
Delete	Delete an item selected in the pane. This item is invalid if nothing is selected. This item is invalid while the program is running.

Context Menu

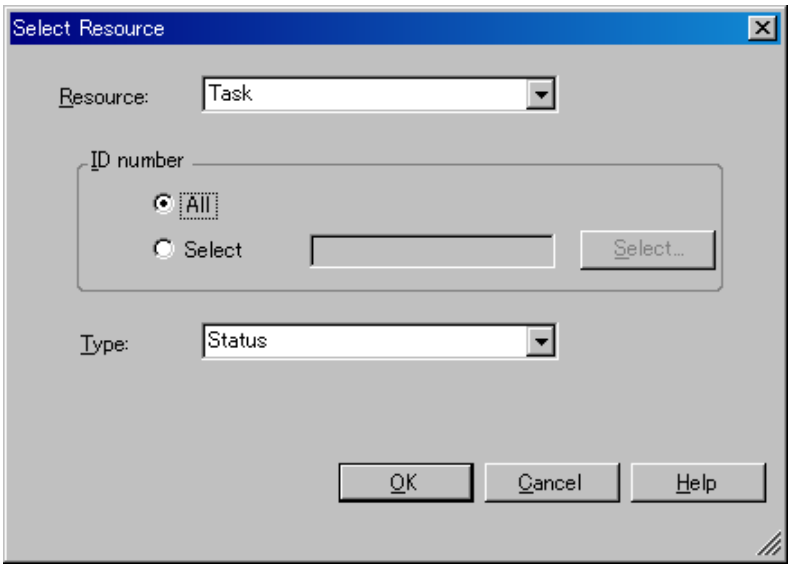
The context menu is displayed by right-clicking the mouse on the resource information pane.

Name of Menu	Description	
Real-time display update setting	Selecting this item opens the property pane for setting up updating of the real-time display. This item is invalid while a program is running.	
Update information	Selecting this item updates the information.	
Add new resource ...	Selecting this item allows registration of a new resource. The [Select Resource] Dialog Box is displayed. An added resource is displayed in the lowest line. Note that the number of resources to be registered on a tabbed page is up to 1000. This item is invalid while a program is running.	
Edit resource ...	Selecting this item allows editing of the selected resource. The [Select Resource] Dialog Box is displayed. This item is invalid when nothing is selected, and when two or more items are selected. This item is invalid while a program is running.	
Delete	Selecting this item deletes the selected item in the pane. This item is invalid when nothing is selected. This item is invalid while a program is running.	
Notation	The following cascaded menu is displayed for specification of the display's notation. This item is invalid when nothing is selected. This item is invalid while a program is running.	
	Automatic	Automatically set the notation of the selected item.
	Hexadecimal	Display the selected item in hexadecimal.
	Decimal	Display the selected item in decimal.
Jump to source	Selecting this item opens an editor pane in which the source code of the task or handler is displayed. This item is invalid when nothing is selected, and when two or more items are selected. This item is invalid while a program is running.	
Select OS ...	Selecting this item opens the [Select OS] Dialog Box. This item is invalid while a program is running.	

[Select Resource] Dialog Box

This dialog box is for select the resource information to be displayed in the resource information pane. One ID number or all of the ID numbers can be specified. The items selectable for a resource vary according to the real-time OS.

Figure A-2. [Select Resource] Dialog Box



The following items are explained here.

- Opening the box
- Selected contents

Opening the box

- Select [Add new resource] or [Edit resource] in the context menu of the Resource Information pane.

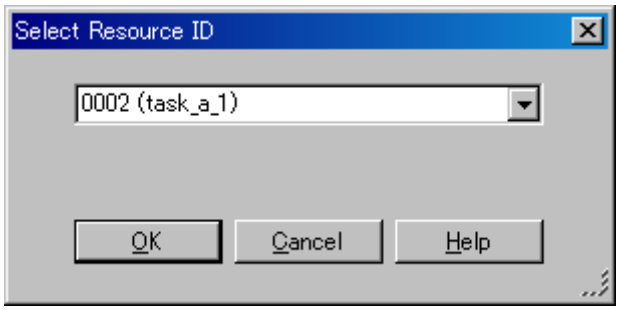
Selected contents

Selected item		Description
Resource		Selecting this item allows selection of the type of resource.
ID number	All	Selecting this item specifies all of the ID numbers.
	Select	Selecting this item allows specification of an ID number. Enter an ID number or click on the [Select] button to open the [Select ID] Dialog Box, then select an ID number from the list.
Type		Selecting this item allows selection of a type of resource information.

[Select ID] Dialog Box

Select a resource ID from the list.

Figure A-3. [Select ID] Dialog Box



The following items are explained here.

- Opening the Box

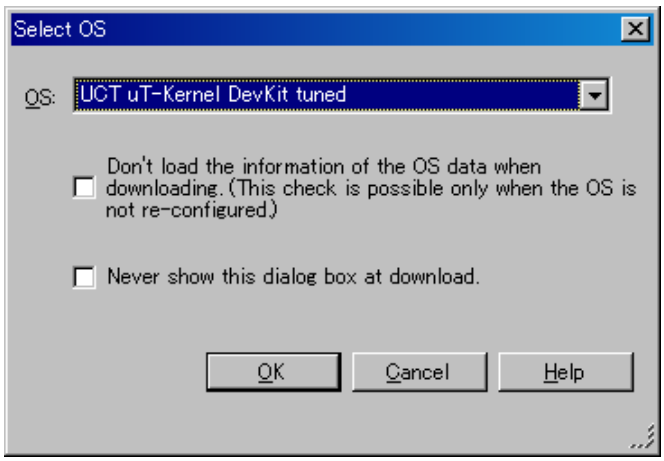
Opening the Box

- Select the [Select] button in the [Select Resource] Dialog Box.

[Select OS] Dialog Box

Select the real-time OS that is to be used.

Figure A-4. [Select OS] Dialog Box



The following items are explained here.

- Opening the box

Opening the box

- This dialog box is automatically opened when a program is downloaded.
- Select [Select OS] in the context menu of the Resource Information pane.

APPENDIX B Messages

In this appendix, the messages output by the Partner OS Aware Debugging Plug-in are explained.
The messages are output to the output pane or in message boxes.

B.1 Fatal Error

Table B-1. Fatal Errors

Name	Description	
E1160020	Message	Failure to open a file.
	Explanation	The plug-in was unable to open a file.
	How to cope with	Confirm whether the file is or is not accessible.
E1160021	Message	Failure to read a file.
	Explanation	The plug-in was unable to read a file.
	How to cope with	Confirm whether the file is or is not readable.
E1160022	Message	Failure in writing to a file.
	Explanation	The plug-in was unable to write to a file.
	How to cope with	Confirm whether the file is or is not writable.
E1160023	Message	Failure to close a file.
	Explanation	The plug-in was unable to close a file.
	How to cope with	Confirm whether the file is or is not accessible.

B.2 Warning

Table B-2. Warning

Name	Description	
W1160020	Message	The maximum number of resources (one thousand) which can be registered on a tabbed page of the resource information pane was exceeded.
	Explanation	The upper limit on the number of resources which can be registered was exceeded. The number of resources which can be registered on a tabbed page is up to one thousand.
	How to cope with	Delete unnecessary resources or register some of the resources on other tabbed pages so that the number on the given page is no greater than one thousand.
W1160021	Message	There is not available resource that can be registered.
	Explanation	The specified resource does not exist.
	How to cope with	Specify valid resources.
W1160022	Message	The specified ID number is invalid.
	Explanation	The specified ID number does not exist.
	How to cope with	Specify valid ID numbers.

APPENDIX C Notes

This appendix contains cautionary notes.

C.1 Cautionary Notes

Table C-1. Cautionary Notes

Name	Description
General	If the Partner OS Aware Debugging Plug-in is to be used, downloaded programs must have been assembled or compiled with the output of debugging information.
	The debugging function might not operate normally if the build options for the compiler or assembler in the tool chain are changed from those provided for use with the OS.
	Refer to the pane after initializing the real-time OS.
	The pane might not be displayed normally while a program is running.
Smalight OS	The task ID "255" means idling of the OS kernel.
uT-Kernel	Be sure to set “1” to the minimum ID (e.g. MIN_TSKID), the minimum priority (MIN_PRI), the debugger support function (USE_DBGSPT) and the object name (USE_OBJECT_NAME) in the configuration files (config.h and config.inc).
uC/OS	The debugging function might not operate normally if the contents of the configuration file (os_cfg.h and cpu_cfg.h) are changed from the initial values.
	The task IDs displayed in this plug-in are internal IDs for debugging, and are different from the task IDs of uC/OS.
	The maximum task ID number displayable in the resource information pane is 255.
embOS	Task names are not displayed while the XR library is in use.
	The task IDs displayed in this plug-in are internal IDs for debugging, and are different from the task IDs of embOS.
	The maximum task ID number displayable in the resource information pane is 255.

Revision History

Rev.	Date	Description		
		Page	Before Modification	After Modification
1.00	Oct 01, 2012	-	First Edition issued	

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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

Colophon 1.3

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Partner OS Aware Debugging Plug-in

Renesas Electronics Corporation

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