User's Manual

RI850V4 V1.00.02

Real-Time Operating System

User's Manual: Debug

Target Device
V850 Microcontroller

Renesas Electronics
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How to Use This Manual

Readers

This manual is intended for users who design and develop application systems using V850 microcontrollers products.

Purpose

This manual is intended for users to understand the functions of real-time OS "RI850V4" manufactured by Renesas Electronics, described the organization listed below.

Organization

This manual can be broadly divided into the following units.

CHAPTER 1 GENERAL
CHAPTER 2 FUNCTIONS
APPENDIX A WINDOW REFERENCE
APPENDIX B INDEX

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, C language, and assemblers.

To understand the hardware functions of the V850 microcontroller.
-> Refer to the **User's Manual** of each product.

Conventions

Data significance:	Higher digits on the left and lower digits on the right
Note:	Footnote for item marked with **Note** in the text
Caution:	Information requiring particular attention
Remark:	Supplementary information
Numeric representation:	Decimal ... XXXX
	Hexadecimal ... 0xXXXX

Prefixes indicating power of 2 (address space and memory capacity):

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

Related Documents

The related documents indicated in this publication may include preliminary versions. However, preliminary versions are not marked as such.

Document Name		Document No.
RI Series	Start	R20UT0751E
	Message	R20UT0756E
RI850V4	Coding	R20UT0515E
	Debug	This manual
	Analysis	R20UT0517E

Caution The related documents listed above are subject to change without notice. Be sure to use the latest edition of each document when designing.

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CHAPTER 1 GENERAL

The CubeSuite+ is an integrated development environment used to carry out tasks such as design, coding, build and debug for developing application systems for microcontrollers manufactured by Renesas Electronics.

This manual describes the resource information tool. This tool is useful for debugging programs using the "RI850V4" real-time OS functionality within this integrated program-development process.

1.1 Overview

When debugging programs using the RI850V4 functionality, it is possible to use the resource information tool to confirm and modify the resource information (e.g. system information and memory area information) that changes dynamically as the program executes.

1.2 Features

Below are the features of the resource information tool.

- Confirm resource information
  When the program running in the debugging tool is stopped at an arbitrary location, the current status of the resource information appears in the Realtime OS Resource Information panel.

- Change resource information
  It is possible to dynamically modify the resource information (e.g. the RI850V4 system time and task status) by issuing service calls provided by the RI850V4 from the Realtime OS Resource Information panel.

CHAPTER 2 FUNCTIONS

This chapter describes the key functions provided by the resource information tool along with operation procedures.

2.1 Overview

The resource information tool can be used to confirm and modify the resource information (e.g. system information and memory area information) that changes dynamically as the program executes.

The operating procedures for the resource information tool are described below.

(1) Start CubeSuite+

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

Remark See "CubeSuite+ Integrated Development Environment User's Manual: Start" for details on "Start CubeSuite+".

(2) Open project

Open the project to debug.

Remark See "CubeSuite+ Integrated Development Environment User's Manual: Start" for details on "Open project".

(3) Select debug tool

Select the type of debugging tool with which to debug the program (IECUBE, IECUBE2, MINICUBE, MINICUBE2, E1, E20 or Simulator).

Remark See "CubeSuite+ Integrated Development Environment User's Manual: V850 Debug" for details on "Select debug tool".

(4) Download programs

Download the program to debug.

Remark See "CubeSuite+ Integrated Development Environment User's Manual: V850 Debug" for details on "Download programs".

(5) Open Realtime OS Resource Information Panel

Open the Realtime OS Resource Information panel.

Remarks 1. When a program using the RI850V4 functionality is downloaded, this panel opens automatically.

2. The value will be indeterminate for the resource information shown when the RI850V4 system initialization is incomplete, because it will not be managed by the RI850V4.

(6) Execute/stop programs

Run the program to the location for which you wish to display the resource information.

Remark See "CubeSuite+ Integrated Development Environment User's Manual: V850 Debug" for details on "Execute/stop programs".

(7) Confirm Resource Information

On the Realtime OS Resource Information panel tabs (e.g. [System] tab and [Memory Area] tab), check the current status of the resource information.

(8) Change Resource Information

Change the contents of the resource information (e.g. RI850V4 system time and task status) by issuing service calls from the Realtime OS Resource Information panel.

2.2 Open Realtime OS Resource Information Panel

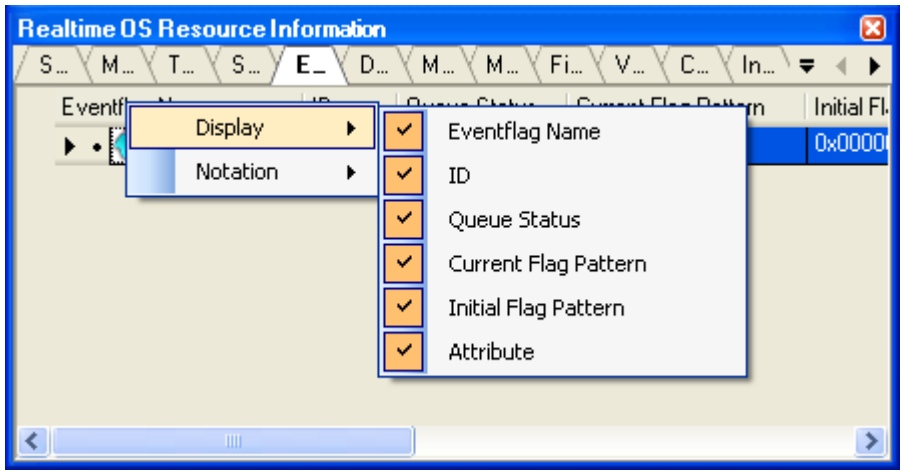
The Realtime OS Resource Information panel is used to confirm or modify the resource information (e.g. system information and memory area information). This panel opens automatically when a program using the RI850V4 functionality is downloaded.

2.2.1 Select item

The resource information tool enables you to select the items to display in the Realtime OS Resource Information panel.

To select which items are displayed, right click on the header (header column or row) in the Realtime OS Resource Information panel, and from the context menu that appears, select "Display".

Figure 2-1. Select Item



Remark Select items to display by selecting their checkboxes.

Table 2-1. Select Item

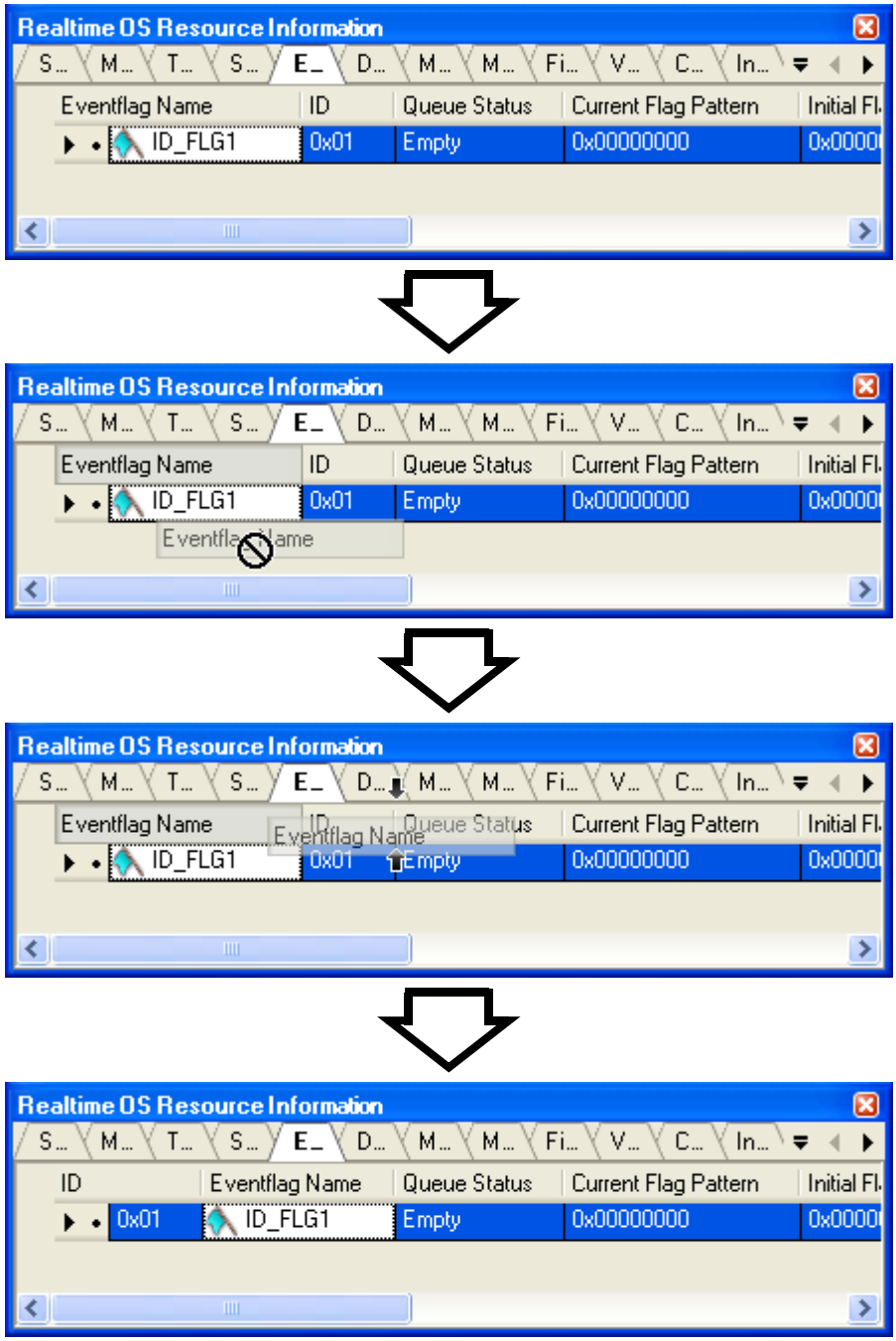
Checked	The item in question will be displayed.
Not checked	The item in question will not be displayed.

2.2.2 Change display order

The resource information tool enables you to change the order of items displayed in the Realtime OS Resource Information panel.

To change the display order, drag the columns in the Realtime OS Resource Information panel, and drop them to the desired position.

Figure 2-2. Change Display Order (Move "ID" Column)



2.3 Confirm Resource Information

Check the resource information when program execution is stopped via the various tabs of the Realtime OS Resource Information panel (e.g. [System] tab and [Memory Area] tab).

The Realtime OS Resource Information panel is made up of the following tabs.

- [System] tab
- [Memory Area] tab
- [Task] tab
- [Semaphore] tab
- [Eventflag] tab
- [Data Queue] tab
- [Mailbox] tab
- [Mutex] tab
- [Fixed-Sized Memory Pool] tab
- [Variable-Sized Memory Pool] tab
- [Cyclic Handler] tab
- [Interrupt Handler] tab
- [Initialize Routine] tab
- [Extended Service Call Routine] tab
- [Ready Queue] tab
- [Timer Queue] tab

Remark Switch tabs in the tab selection area of the Realtime OS Resource Information panel.

2.4 Change Resource Information

You can change the contents of the resource information (e.g. RI850V4 system time and task status) by issuing service calls from the Realtime OS Resource Information panel.

Below is a list of service calls that can be issued from the Realtime OS Resource Information panel.

Table 2-2. Issuable Service Calls

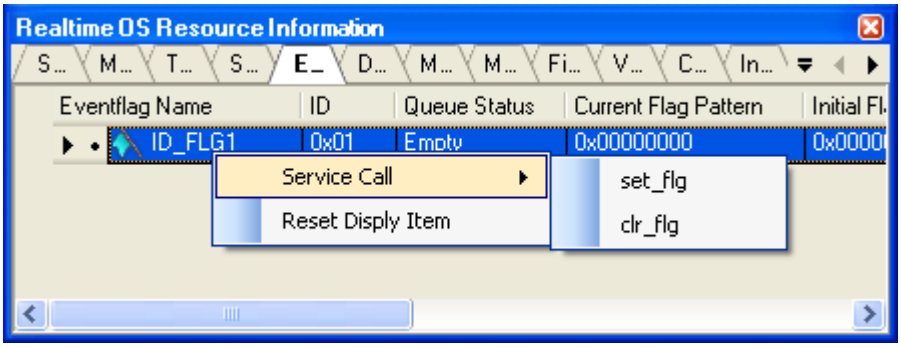
Tab Name	Service Call Name
[System] tab	set_tim, dis_dsp, ena_dsp, loc_cpu, unl_cpu
[Memory Area] tab	-
[Task] tab	rel_wai, ter_tsk, chg_pri, sus_tsk, rsm_tsk, frsm_tsk, wup_tsk, can_wup, act_tsk, can_act, ras_tex
[Semaphore] tab	sig_sem, pol_sem
[Eventflag] tab	set_flg, clr_flg
[Data Queue] tab	psnd_dtq, fsnd_dtq, prcv_dtq
[Mailbox] tab	-
[Mutex] tab	unl_mtx
[Fixed-Sized Memory Pool] tab	-
[Variable-Sized Memory Pool] tab	-
[Cyclic Handler] tab	sta_cyc, stp_cyc
[Interrupt Handler] tab	-
[Initialize Routine] tab	-
[Extended Service Call Routine] tab	-
[Ready Queue] tab	rot_rdq
[Timer Queue] tab	-

Remark See "RI850V4 Real-Time Operating System User's Manual: Coding" for details about service call functions.

2.4.1 Issue service call

To issue a service call, right click with the mouse in the footer (footer column or row) of one of the tabs on the Realtime OS Resource Information panel, and from the context menu that appears, select "Service Call".

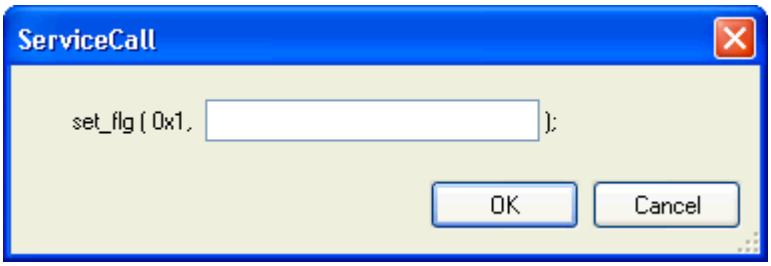
Figure 2-3. Issue Service Call (Context Menu)



Remarks 1. If a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.

2. When a service call name is selected from the context menu, the ServiceCall dialog box opens. Enter an appropriate value in the text box as required, then click [OK] to execute the service-call process.

Figure 2-4. Issue Service Call (ServiceCall Dialog Box)



APPENDIX A WINDOW REFERENCE

This appendix describes the panels and dialog boxes of the resource information tool.

A.1 Description

The panels and dialog boxes of the resource information tool are listed below.

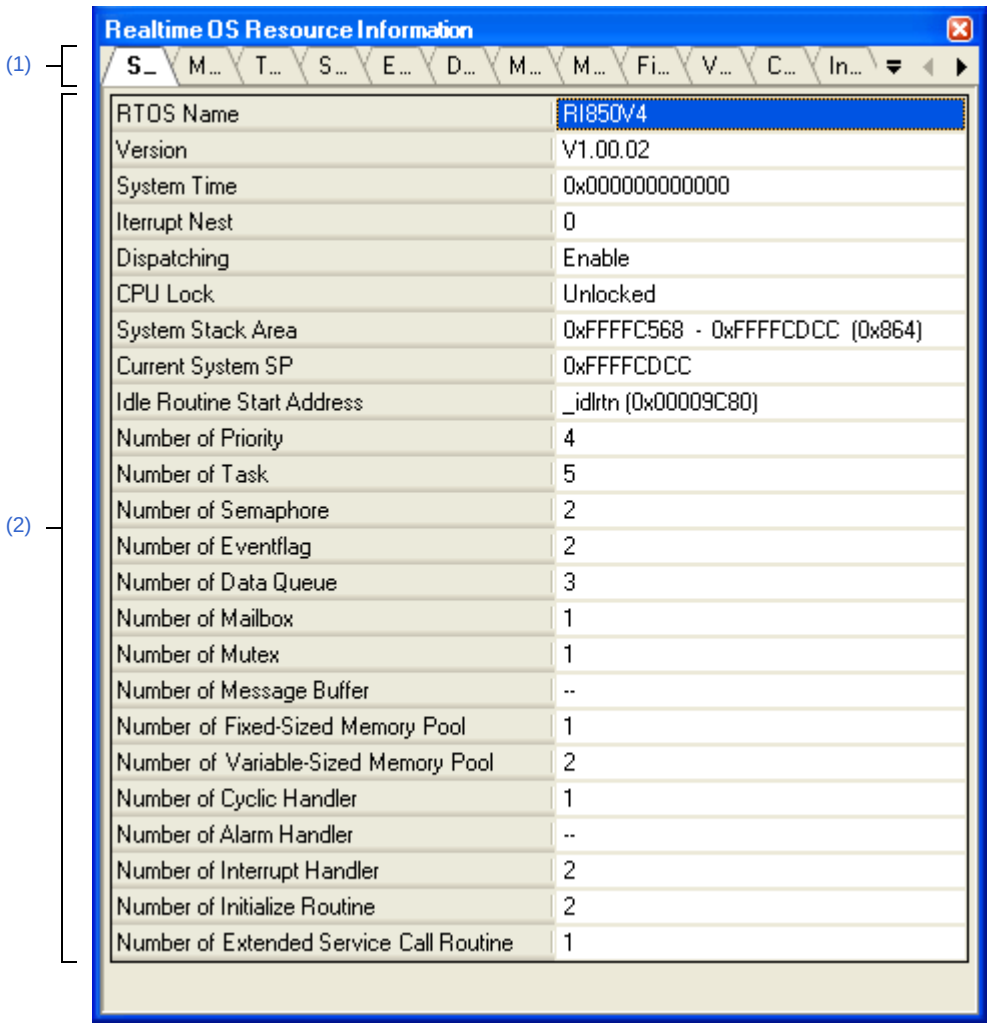
Table A-1. Panel/Dialog Box List

Panel/Dialog Box Name	Description
Realtime OS Resource Information panel	This panel displays the resource information (e.g. system information and memory area information) of the RI850V4.
ServiceCall dialog box	Execute a service call process.

Realtime OS Resource Information panel

This panel displays the resource information (e.g. system information and memory area information) of the RI850V4.

Figure A-1. Realtime OS Resource Information Panel



The following items are explained here.

- [How to open]
- [Description of each area]

[How to open]

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

[Description of each area]

(1) Tab selection area

Select a tab to switch the content displayed in the Information display area.

This panel has the following tabs:

- [System] tab

- [Memory Area] tab
- [Task] tab
- [Semaphore] tab
- [Eventflag] tab
- [Data Queue] tab
- [Mailbox] tab
- [Mutex] tab
- [Fixed-Sized Memory Pool] tab
- [Variable-Sized Memory Pool] tab
- [Cyclic Handler] tab
- [Interrupt Handler] tab
- [Initialize Routine] tab
- [Extended Service Call Routine] tab
- [Ready Queue] tab
- [Timer Queue] tab

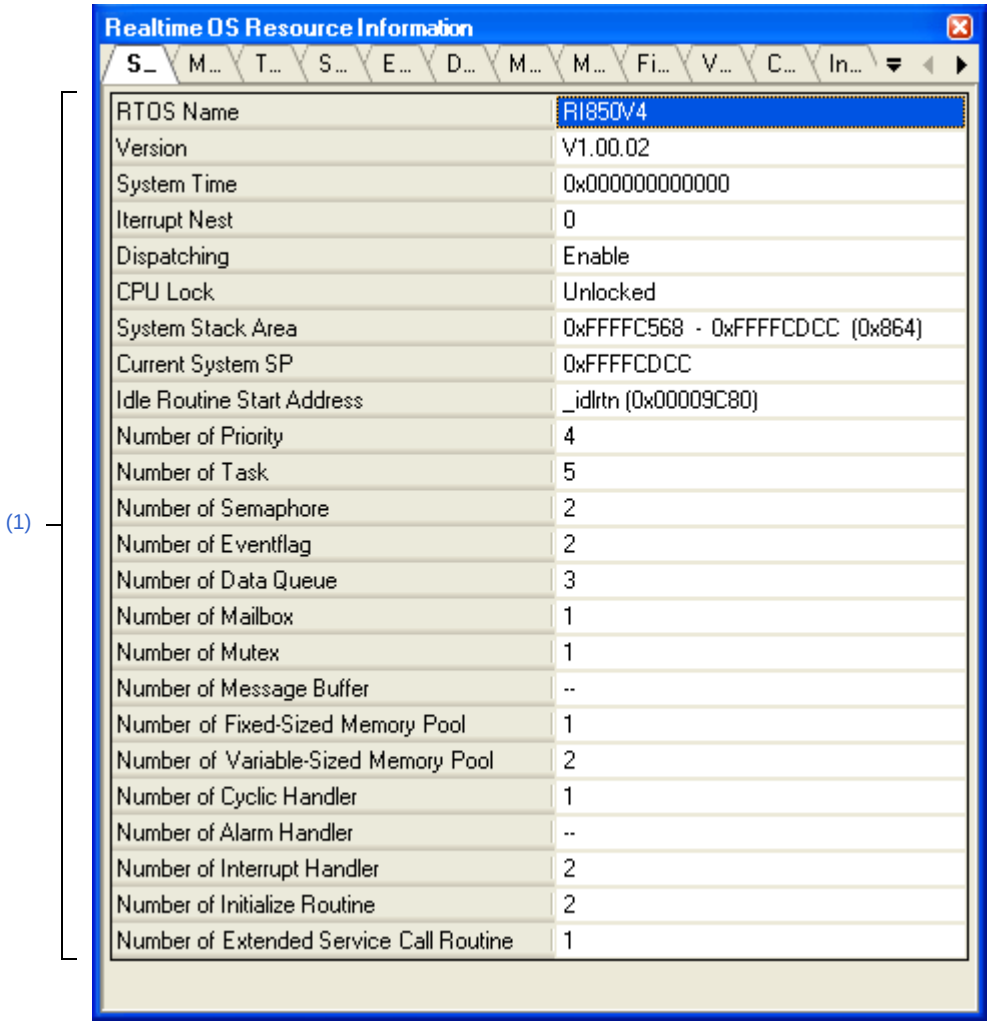
(2) Information display area

This area displays the resource information (e.g. system information and memory area information) of the RI850V4.

[System] tab

This tab displays the system information (e.g. RTOS Name and Version) of the RI850V4.

Figure A-2. [System] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

This area displays the system information (e.g. RTOS Name and Version) of the RI850V4.

This area consists of the following items.

RTOS Name	The RTOS name "RI850V4" is shown.	
Version	The version of the RI850V4 is shown.	
System Time	The system time of the RI850V4 (in milliseconds) is shown.	
Interrupt Nest	The nesting level of interrupt processes (including CPU exception processes) is shown.	
Dispatching	The system state of the RI850V4 is shown.	
	Disable	Dispatch disabled state
	Enable	Dispatch enabled state
CPU Lock	The system state of the RI850V4 is shown.	
	Locked	CPU locked state
	Unlocked	CPU unlocked state
System Stack Area	The start address, end address, and size (in bytes) of the system stack are shown in the following format. Start address - End address (Size)	
Current System SP	If the processing program is operating on the system stack, the start address of the system stack is shown. If it is running on the task stack, then the current SP value is shown.	
Idle Routine Start Address	The start address of the idle routine is shown.	
Number of Priority	The maximum priority of the task is shown.	
Number of Task	The total number of tasks is shown.	
Number of Semaphore	The total number of semaphores is shown.	
Number of Eventflag	The total number of eventflags is shown.	
Number of Data Queue	The total number of data queues is shown.	
Number of Mailbox	The total number of mailboxes is shown.	
Number of Mutex	The total number of mutexes is shown.	
Number of Message Buffer	"--" is shown.	
Number of Fixed-Sized Memor Pool	The total number of fixed-sized memory pools is shown.	
Number of Variable-Sized Memory Pool	The total number of variable-sized memory pools is shown.	
Number of Cyclic Handler	The total number of cyclic handlers is shown.	
Number of Alarm Handler	"--" is shown.	
Number of Interrupt Handler	The total number of interrupt handlers/CPU exception handlers is shown.	
Number of Initialize Routine	The total number of initialize routines is shown.	
Number of Extended Service Call Routine	The total number of extended service call routines is shown.	

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header column

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. RTOS Name, Version, System Time, Interrupt Nest, Dispatching, CPU Lock, System Stack Area, Current System SP, Idle Routine Start Address, Number of Priority, Number of Task, Number of Semaphore, Number of Eventflag, Number of Data Queue, Number of Mailbox, Number of Mutex, Number of Message Buffer, Number of Fixed-Sized Memory Pool, Number of Variable-Sized Memory Pool, Number of Cyclic Handler, Number of Alarm Handler, Number of Interrupt Handler, Number of Initialize Routine, Number of Extended Service Call Routine	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. System Time, Interrupt Nest, System Stack Area, Current System SP, Idle Routine Start Address, Number of Priority, Number of Task, Number of Semaphore, Number of Eventflag, Number of Data Queue, Number of Mailbox, Number of Mutex, Number of Message Buffer, Number of Fixed-Sized Memory Pool, Number of Variable-Sized Memory Pool, Number of Cyclic Handler, Number of Alarm Handler, Number of Interrupt Handler, Number of Initialize Routine, Number of Extended Service Call Routine	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

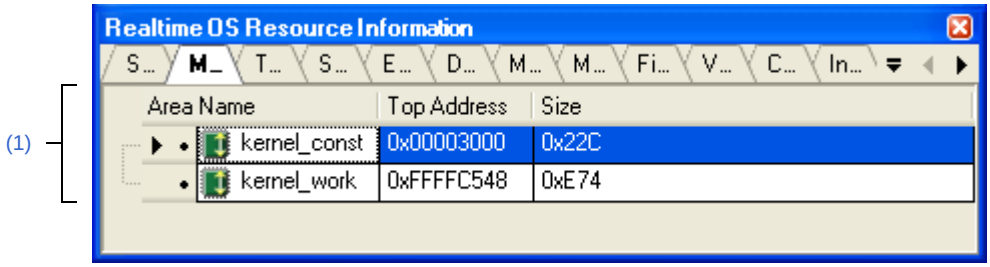
(2) Footer column

Jump to Memory (Current System SP)	Opens the Memory panel, and displays the contents of the Current System SP.	
Jump to Source (Idle Routine Start Address)	Opens the Editor panel, and displays the source code of the idle routine.	
Jump to Disassemble (Idle Routine Start Address)	Opens the Disassemble panel, and displays the results of disassembling the idle routine.	
Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	set_tim	Set system time.
	dis_dsp	Disable dispatching.
	ena_dsp	Enable dispatching.
	loc_cpu	Lock the CPU.
	unl_cpu	Unlock the CPU.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Memory Area] tab

This tab displays the memory area information (e.g. Area Name and Top Address) of the RI850V4.

Figure A-3. [Memory Area] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

This area displays the memory area information (e.g. Area Name and Top Address) of the RI850V4.
This area consists of the following items.

Area Name	The name of the managed memory area is shown.	
	kernel_const	Area where initial information items related to OS resources that do not change dynamically are allocated as system information tables.
	kernel_work	Area where the system stack, the task stack, data queue, fixed-sized memory pool and variable-sized memory pool are to be allocated.
Top Address	The start address of the managed memory area is shown.	
Size	The size of the managed memory area (in bytes) is shown.	

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.

Selected item name	The following items are displayed for selection. Area Name, Top Address, Size	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. Top Address, Size	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

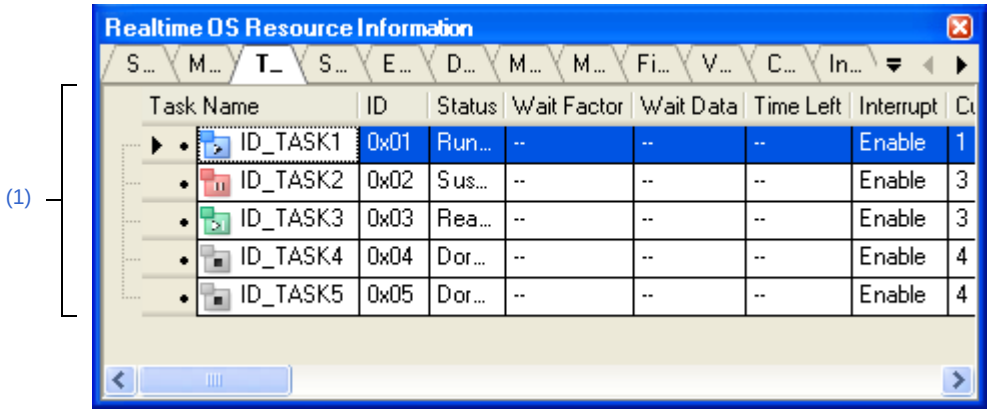
(2) Footer row

Jump to Memory (Top Address)	Opens the Memory panel, and displays the contents of the managed memory area.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

[Task] tab

This tab displays the task information (e.g. Task Name and ID) of the RI850V4.

Figure A-4. [Task] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the task information (e.g. Task Name and ID) of the RI850V4.
This layer consists of the following items.

Task Name	An icon indicating the current status of the task and the name of the task are shown in the following format. Icon Name Note that if the name of the task is undefined, the name will appear as "ID".	
		DORMANT state
		READY state
		RUNNING state
		WAITING state
		SUSPENDED state
		WAITING-SUSPENDED state
ID	The ID of the task is shown.	

Status	The current state of the task is shown.	
	Dormant	DORMANT state
	Ready	READY state
	Running	RUNNING state
	Waiting	WAITING state
	Suspended	SUSPENDED state
	Waiting-Suspended	WAITING-SUSPENDED state
Wait Factor	The task wait factor (type of WAITING state, object ID and attribute of WAITING state) are shown in the following format. Type (ID) Attribute Note that if the current state of the task is other than WAITING state or WAITING-SUSPENDED state, "--" appears. If the WAITING state type is sleeping state or delayed state, then "(Object ID)" is not shown.	
	[Type of WAITING state]	
	SLP	Sleeping state
	DLY	Delayed state
	SEM	WAITING state for a semaphore resource
	FLG	WAITING state for an eventflag
	SDTQ	Sending WAITING state for data queue
	RDTQ	Receiving WAITING state for a data queue
	MBX	Receiving WAITING state for a mailbox
	MTX	WAITING state for a mutex
	MPF	WAITING state for a fixed-sized memory block
	MPL	WAITING state for a variable-sized memory block
	[Attribute of WAITING state]	
	ANDW	AND waiting condition
	ORW	OR waiting condition
	TMO	Waiting for timeout
	FIFO	FIFO order
	PRI	Task priority order
Wait Data	The request conditions triggering the task's transition to WAITING state are shown. Note that if the current state of the task is other than waiting state for an eventflag, sending waiting state for a data queue, or waiting state for a variable-sized memory block, "--" is shown.	
	Wait bit pattern	Waiting state for an eventflag
	Data element to be sent to the data queue	Sending waiting state for a data queue
	Memory block size to be acquired	Waiting state for a variable-sized memory block

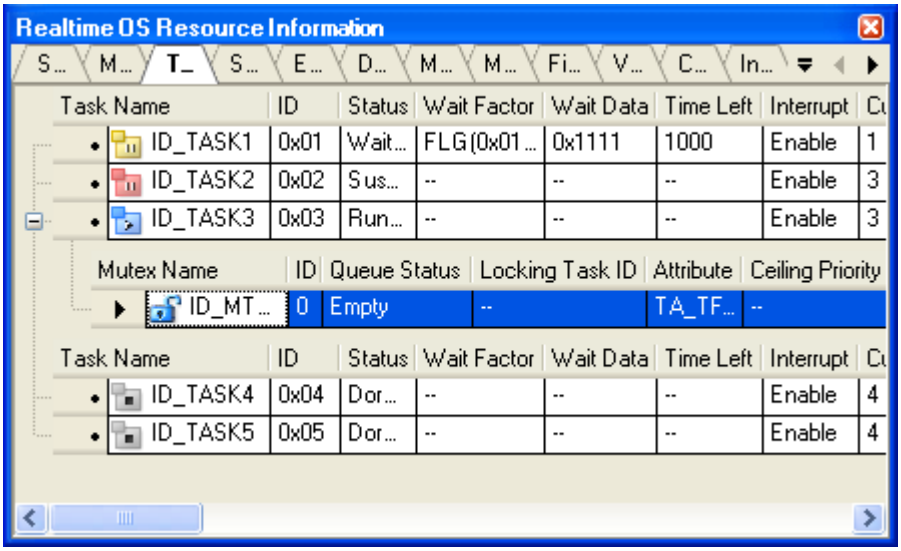
Time Left	The time left until the delayed state is released (in milliseconds) is shown. Note that if the task is waiting forever, "TMO_FEVR" appears. If the current state of the task is other than WAITING state or WAITING-SUSPENDED state, "--" appears.	
Interrupt	The current interrupt state of the task is shown.	
	Disable	All interrupts are disabled.
	Enable	All interrupts are enabled.
Current Priority	The current priority of the task is shown.	
Task Start Address	The start address of the task is shown.	
Current PC	The current PC value of the task is shown.	
Current Task SP	The current SP value of the task is shown.	
Task Stack Area	The start address, end address, and size (in bytes) of the task stack are shown in the following format. Start address - End address (Size)	
Initial Priority	The initial priority of the task is shown.	
Suspend Count	The suspension count of the task is shown.	
Wakeup Count	The wakeup request count of the task is shown.	
Activate Count	The activation request count of the task is shown.	
Attribute	The attributes of the task (coding language of task, initial activation state of task, initial preemption state of task and initial interrupt state of task) are shown in the following format. Coding language Initial activation state Initial preemption state Initial interrupt state	
	[Coding language of task]	
	TA_HLNG	C language
	TA_ASM	Assembly language
	[Initial activation state of task]	
	TA_ACT	READY state
	Nothing displayed	DORMANT state
	[Initial preemption state of task]	
	TA_DISPREEMPT	Preemption is disabled at task activation.
	Nothing displayed	Preemption is enabled at task activation.
	[Initial interrupt state of task]	
	TA_DISINT	All interrupts are disabled at task activation.
	TA_ENAINT	All interrupts are enabled at task activation.
Extended Information	The extended information of the task is shown.	
Tex Start Address	The start address of the task exception handling routine is shown. Note that if the task exception handling routine is undefined, the name will appear as "--".	
Tex Status	The current status of the task exception handling routine is shown. Note that if the task exception handling routine is undefined, the name will appear as "--".	

	TTEX_DIS	Disable task exceptions
	TTEX_ENA	Enable task exceptions
Tex Request Pattern	The pending exception code of the task exception handling routine is shown. Note that if the task exception handling routine is undefined, the name will appear as "--".	
Tex Executing Pattern	The task exception code of the task exception handling routine is shown. Note that if the task exception handling routine is undefined, the name will appear as "--".	
Tex Attribute	The coding language of the task exception handling routine is shown. Note that if the task exception handling routine is undefined, the name will appear as "--".	
	TA_HLNG	C language
	TA_ASM	Assembly language

(b) Second layer

See the [Mutex] tab for details about locking mutex information.

Figure A-5. [Task] Tab (Locking Mutex Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Task Name, ID, Status, Wait Factor, Wait Data, Time Left, Interrupt, Current Priority, Task Start Address, Current PC, Current Task SP, Task Stack Area, Initial Priority, Suspend Count, Wakeup Count, Activate Count, Attribute, Extended Information, Tex Start Address, Tex Status, Tex Request Pattern, Tex Executing Pattern, Tex Attribute	
	Checked	The item in question will be displayed.

	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Wait Factor, Wait Data, Time Left, Current Priority, Task Start Address, Current PC, Current Task SP, Task Stack Area, Initial Priority, Suspend Count, Wakeup Count, Activate Count, Extended Information, Tex Start Address, Tex Request Pattern, Tex Executing Pattern	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

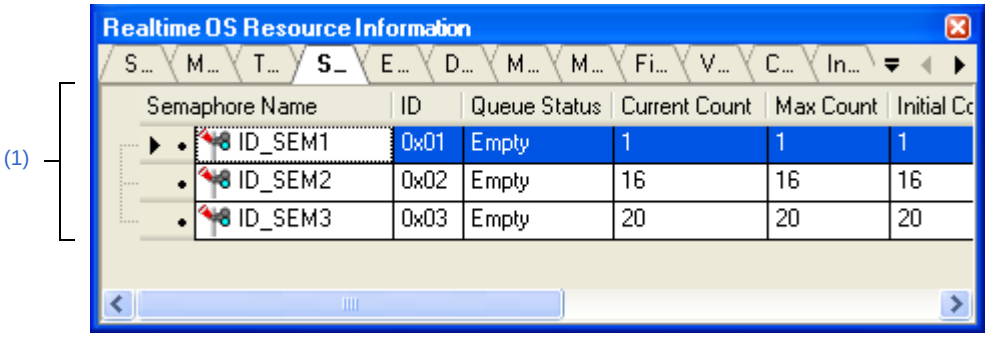
(2) Footer row

Jump to Source (Task Start Address)	Opens the Editor panel, and displays the source code of the task.	
Jump to Disassemble (Task Start Addressy)	Opens the Disassemble panel, and displays the results of disassembling the task.	
Jump to Source (Current PC)	Opens the Editor panel, and displays the contents of the Current PC.	
Jump to Disassemble (Current PC)	Opens the Disassemble panel, and displays the contents of the Current PC.	
Jump to Memory (Current Task SP)	Opens the Memory panel, and displays the contents of the Current Task SP.	
Jump to Source (Tex Start Address)	Opens the Editor panel, and displays the source code of the task exception handling routine.	
Jump to Disassemble (Tex Start Address)	Opens the Disassemble panel, and displays the results of disassembling the task exception handling routine.	
Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	rel_wai	Release task from waiting.
	ter_tsk	Terminate task.
	chg_pri	Change task priority.
	sus_tsk	Suspend task.
	rsm_tsk	Resume suspended task.
	frsm_tsk	Forcibly resume suspended task.
	wup_tsk	Wakeup task.
	can_wup	Cancel task wakeup requests.
	act_tsk	Activate task (queues an activation request).
	can_act	Cancel task activation requests.
	ras_tex	Raise task exception handling.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Semaphore] tab

This tab displays the semaphore information (e.g. Semaphore Name and ID) of the RI850V4.

Figure A-6. [Semaphore] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the semaphore information (e.g. Semaphore Name and ID) of the RI850V4.
This layer consists of the following items.

Semaphore Name	An icon indicating the current status of the semaphore and the name of the semaphore are shown in the following format. Icon Name Note that if the name of the semaphore is undefined, the name will appear as "ID".	
		There are waiting tasks.
		There are no waiting tasks.
ID	The ID of the semaphore is shown.	
Queue Status	The current status of the semaphore is shown.	
	Waiting Tasks	There are waiting tasks.
	Empty	There are no waiting tasks.
Current Count	The current resource count of the semaphore is shown.	
Max Count	The maximum resource count of the semaphore is shown.	

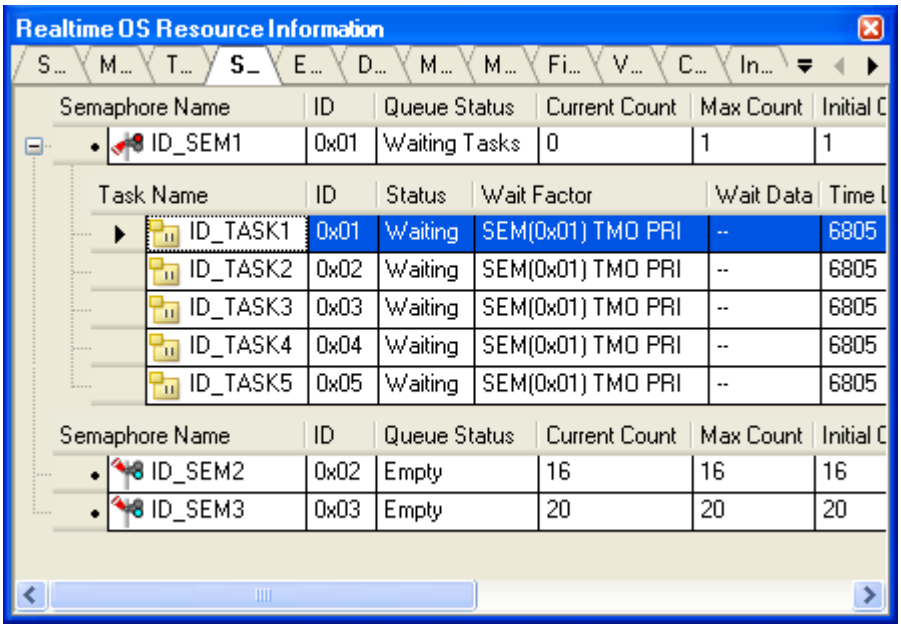
Initial Count	The initial resource count of the semaphore is shown.	
Attribute	The task queuing method is shown.	
	TA_TFIFO	FIFO order
	TA_TPRI	Task priority order

(b) Second layer

The waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the semaphore's wait queue.

See the [Task] tab for details about waiting task information.

Figure A-7. [Semaphore] Tab (Waiting Task Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Semaphore Name, ID, Queue Status, Current Count, Max Count, Initial Count, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Current Count, Max Count, Initial Count	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

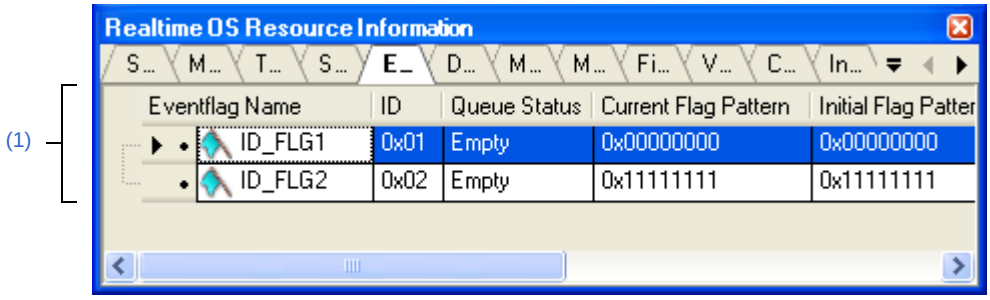
(2) Footer row

Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	sig_sem	Release semaphore resource.
	pol_sem	Acquire semaphore resource (polling).
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Eventflag] tab

This tab displays the eventflag information (e.g. Eventflag Name and ID) of the RI850V4.

Figure A-8. [Eventflag] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the eventflag information (e.g. Eventflag Name and ID) of the RI850V4.
This layer consists of the following items.

Eventflag Name	An icon indicating the current status of the eventflag and the name of the eventflag are shown in the following format. Icon Name Note that if the name of the eventflag is undefined, the name will appear as "ID".	
		There are waiting tasks.
		There are no waiting tasks.
ID	The ID of the eventflag is shown.	
Queue Status	The current status of the eventflag is shown.	
	Waiting Tasks	There are waiting tasks.
	Empty	There are no waiting tasks.
Current Flag Pattern	The current bit pattern of the eventflag is shown.	
Initial Flag Pattern	The initial bit pattern of the eventflag is shown.	

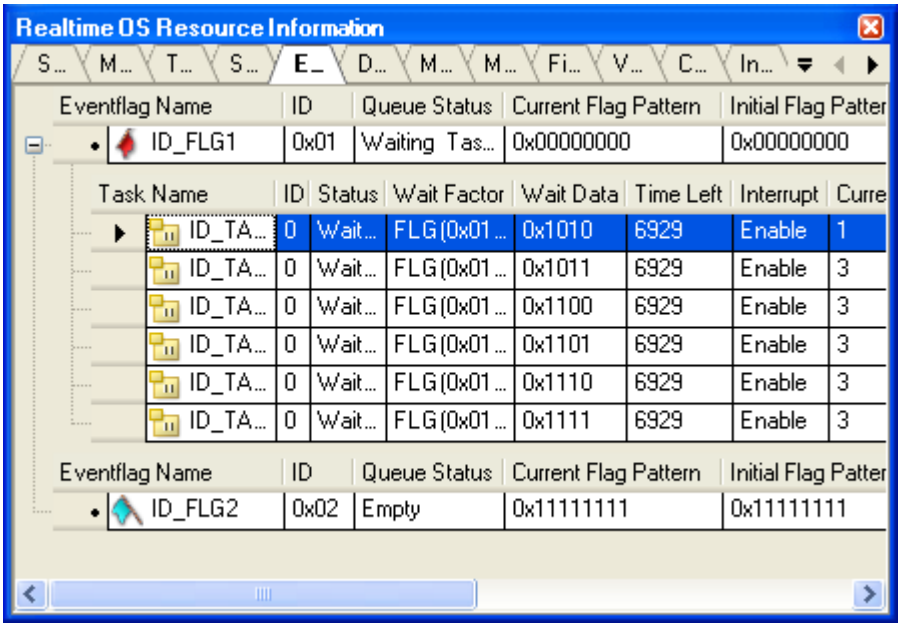
Attribute	The attributes of the eventflag (task queuing method, maximum number of tasks that can be queued and bit pattern clearing flag) are shown in the following format. Queuing method Maximum number Clearing flag	
	[Task queuing method]	
	TA_TFIFO	FIFO order
	TA_TPRI	Task Priority order
	[Maximum number of tasks that can be queued]	
	TA_WSGL	Only one task
	TA_WMUL	Multiple tasks
	[Bit pattern clearing flag]	
	TA_CLR	Bit pattern cleared if the request conditions are met.
	Nothing displayed	Bit pattern not cleared if the request conditions are met.

(b) Second layer

The waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the eventflag's wait queue.

See the [Task] tab for details about waiting task information.

Figure A-9. [Eventflag] Tab (Waiting Task Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.

Selected item name	The following items are displayed for selection. Eventflag Name, ID, Queue Status, Current Flag Pattern, Initial Flag Pattern, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Current Flag Pattern, Initial Flag Pattern	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

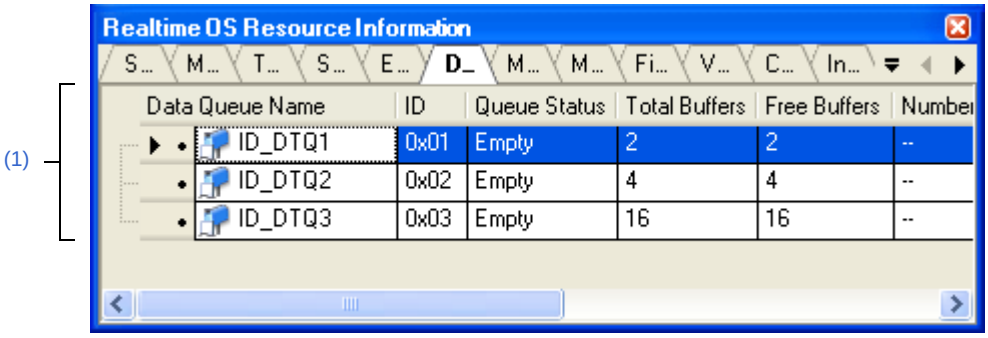
(2) Footer row

Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	set_flg	Set eventflag.
	clr_flg	Clear eventflag.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Data Queue] tab

This tab displays the data queue information (e.g. Data Queue Name and ID) of the RI850V4.

Figure A-10. [Data Queue] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the data queue information (e.g. Data Queue Name and ID) of the RI850V4.
This layer consists of the following items.

Data Queue Name	An icon indicating the current status of the data queue and the name of the data queue are shown in the following format. Icon Name Note that if the name of the data queue is undefined, the name will appear as "ID".	
		There are queued tasks (sending waiting tasks).
		There are queued tasks (receiving waiting tasks).
		There are queud data (receiving waiting data).
		There are no queued tasks/data (waiting tasks/ receiving waiting data).
ID	The ID of the data queue is shown.	

Queue Status	The current status of the data queue is shown.	
	Waiting Tasks (Send)	There are queued tasks (sending waiting tasks).
	Waiting Tasks (Receive)	There are queued tasks (receiving waiting tasks).
	Waiting Data	There are queud data (receiving waiting data).
	Empty	There are no queued tasks/data (waiting tasks/ receiving waiting data).
Total Buffers	Displays the maximum number of data buffers that can be queued.	
Free Buffers	Displays the number of free buffers in the data queue. The number of free buffers is the total number of buffers minus the number of buffers receiving waiting data.	
Number of data	"--" is shown.	
Attribute	Displays the queuing method of the sending waiting tasks. If the queuing method if the receiving waiting tasks is "data reception request order", then the queuing method of the receiving waiting data will be "data send request order".	
	TA_TFIFO	FIFO order
	TA_TPRI	Task priority order

(b) Second layer

<1> Sending waiting task/receive waiting task information

The sending/receiving waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the data queue's wait queue.

See the [Task] tab for details about sending/receiving waiting task information.

Figure A-11. [Data Queue] Tab (Sending Waiting Task Information)

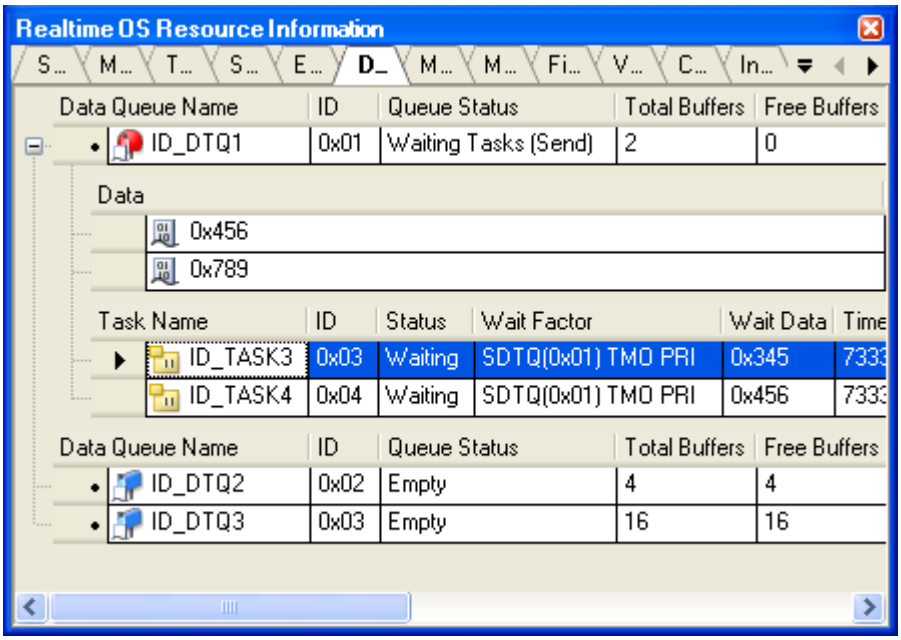
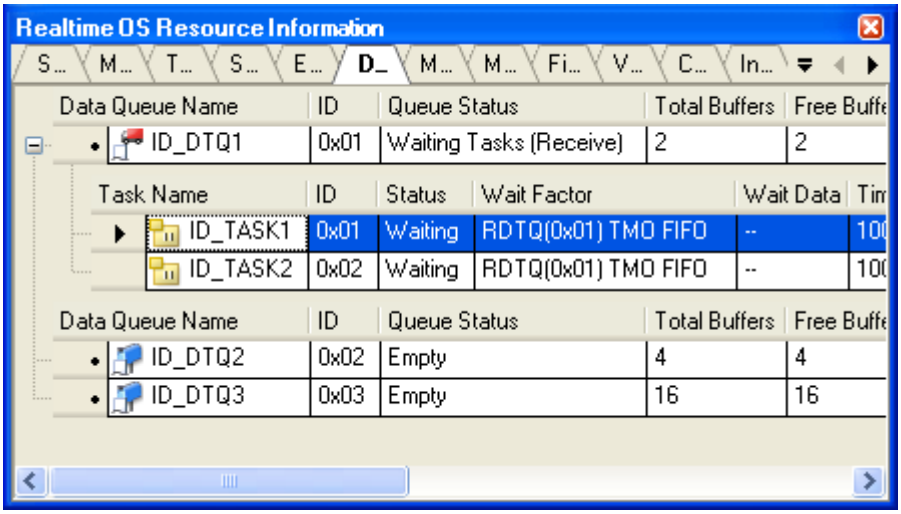


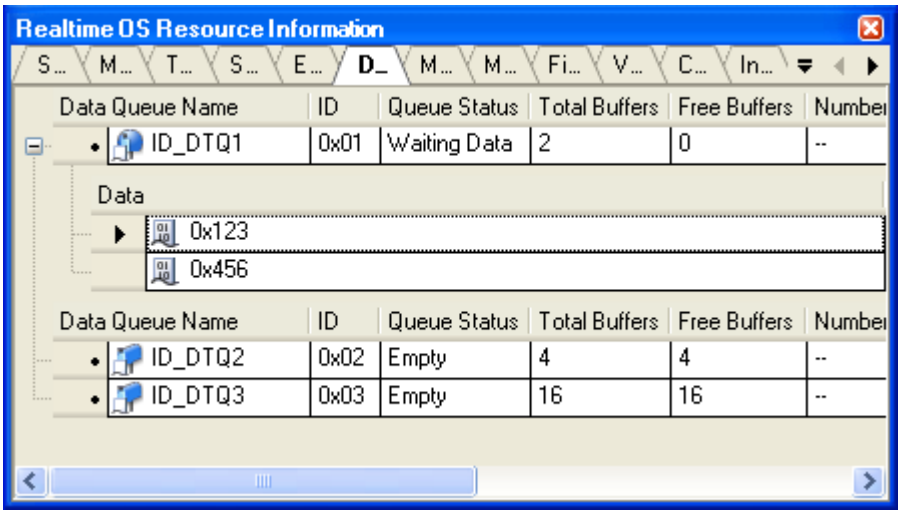
Figure A-12. [Data Queue] Tab (Receiving Waiting Task Information)



<2> Receiving waiting data information

The receiving waiting data information (e.g. Data) only appears if there are data queued in the data queue.

Figure A-13. [Data Queue] Tab (Receiving Waiting Data Information)



This area consists of the following items.

Data	the contents of the data is shown.

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.

Selected item name	The following items are displayed for selection. Data Queue Name, ID, Queue Status, Total Buffers, Free Buffers, Number of Data, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Total Buffers, Free Buffers, Number of Data	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

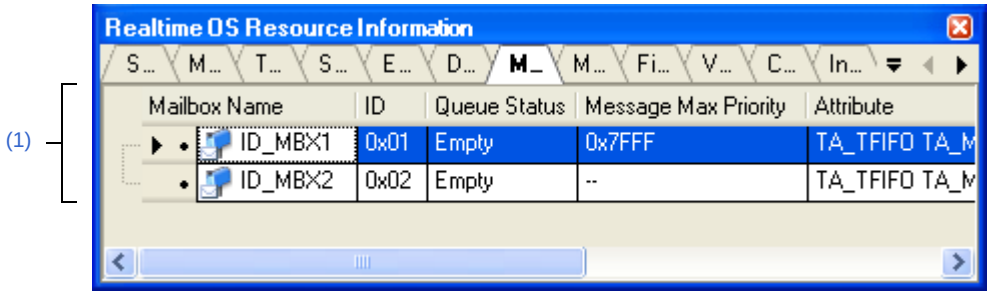
(2) Footer row

Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	psnd_dtq	Send to data queue (polling).
	fsnd_dtq	Forced send to data queue.
	prcv_dtq	Receive from data queue (polling).
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Mailbox] tab

This tab displays the mailbox information (e.g. Mailbox Name and ID) of the RI850V4.

Figure A-14. [Mailbox] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the mailbox information (e.g. Mailbox Name and ID) of the RI850V4.
This layer consists of the following items.

Mailbox Name	An icon indicating the current status of the mailbox and the name of the mailbox are shown in the following format. Icon Name Note that if the name of the mailbox is undefined, the name will appear as "ID".	
		There are waiting tasks.
		There are waiting messages.
		There are no waiting tasks/messages.
ID	The ID of the mailbox is shown.	
Queue Status	The current status of the mailbox is shown.	
	Waiting Tasks	There are waiting tasks.
	Waiting Messages	There are waiting messages.
	Empty	There area no waiting tasks/messages.
Message Max Priority	The maximum priority of the message is shown. Note that if the message queuing method is TA_MFIFO, "--" appears.	

Attribute	The attributes of the mailbox (task queuing method and message queuing method) are shown in the following format. Task Message	
	[Task queuing method]	
	TA_TFIFO	FIFO order
	TA_TPRI	Task priority order
	[Message queuing method]	
	TA_MFIFO	FIFO order
	TA_MPRI	Message priority order

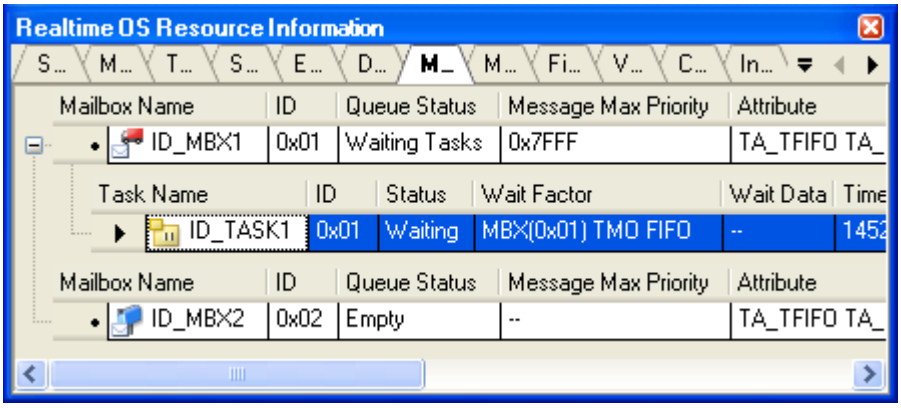
(b) Second layer

<1> Waiting task information

The waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the mailbox's wait queue.

See the [Task] tab for details about waiting task information.

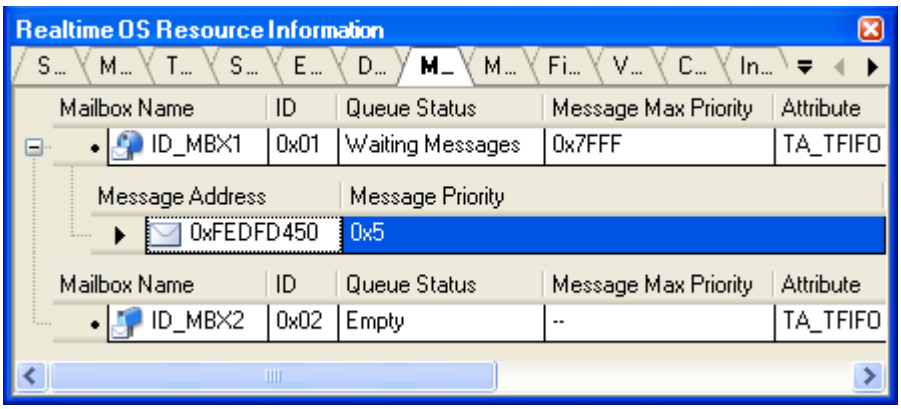
Figure A-15. [Mailbox] Tab (Waiting Task Information)



<2> Waiting message information

The waiting message information (e.g. Message Address and Message Priority) only appears if there are messages queued in the mailbox's wait queue.

Figure A-16. [Mailbox] Tab (Waiting Message Information)



This area consists of the following items.

Message Address	The start address of the message is shown.
Message Priority	The priority of the message is shown. Note that if the priority is not assigned, "--" is shown.

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Mailbox Name, ID, Queue Status, Message Max Priority, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Message Max Priority	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

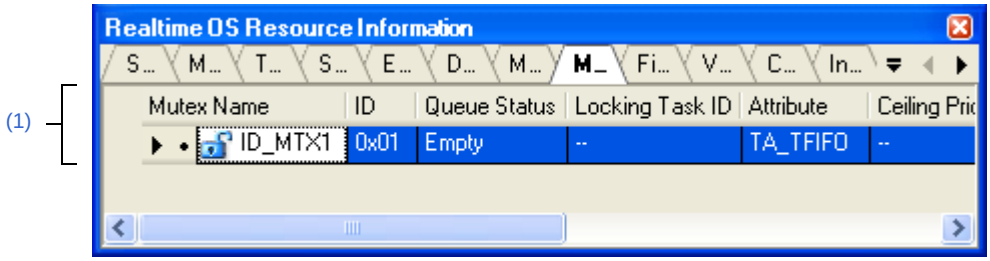
(2) Footer row

Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

[Mutex] tab

This tab displays the mutex information (e.g. Mutex Name and ID) of the RI850V4.

Figure A-17. [Mutex] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the mutex information (e.g. Mutex Name and ID) of the RI850V4.
This layer consists of the following items.

Mutex Name	An icon indicating the current status of the mutex and the name of the mutex are shown in the following format. Icon Name Note that if the name of the mutex is undefined, the name will appear as "ID".	
		There are waiting tasks.
		There are no waiting tasks.
ID	The ID of the mutex is shown.	
Queue Status	The current status of the mutex is shown.	
	Waiting Tasks	There are waiting tasks.
	Empty	There are no waiting tasks.
Locking Task ID	The ID of the locking task is shown.	
Attribute	The task queuing method is shown.	
	TA_TFIFO	FIFO order
	TA_TPRI	Task priority order

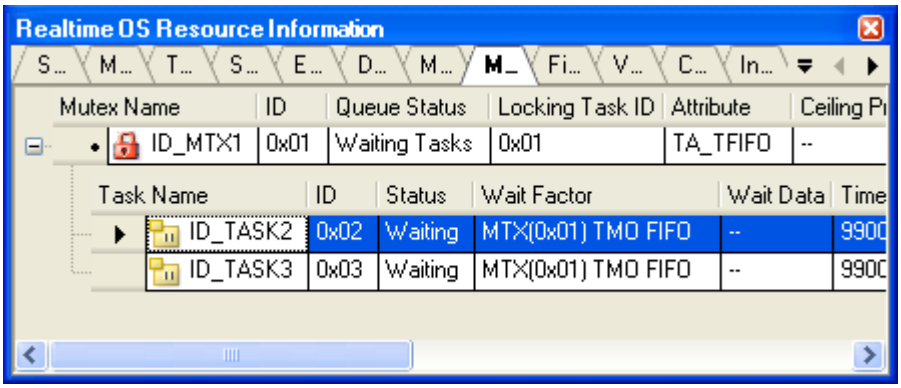
Ceiling Priority	"--" is shown.

(b) Second layer

The waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the mutex's wait queue.

See the [Task] tab for details about waiting task information.

Figure A-18. [Mutex] Tab (Waiting Task Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Muxtex Name, ID, Queue Status, Locking Task ID, Attribute, Ceiling Priority	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Locking Task ID, Ceiling Priority	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

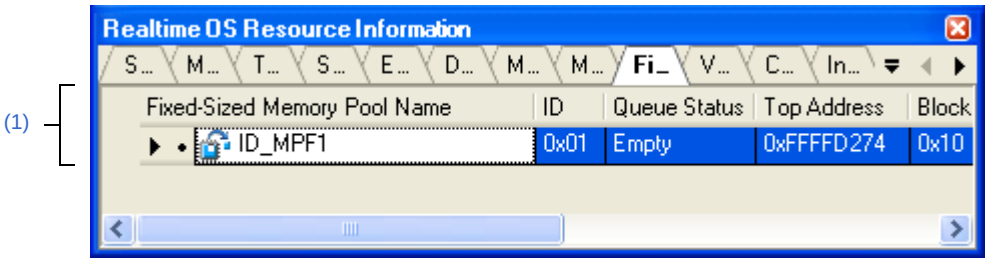
(2) Footer row

Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	unl_mtx	Unlock mutex.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Fixed-Sized Memory Pool] tab

This tab displays the fixed-sized memory pool information (e.g. Fixed-Sized Memory Pool Name and ID) of the RI850V4.

Figure A-19. [Fixed-Sized Memory Pool] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the fixed-sized memory pool information (e.g. Fixed-Sized Memory Pool Name and ID) of the RI850V4.

This layer consists of the following items.

Fixed-Sized Memory Pool Name	An icon indicating the current status of the fixed-sized memory pool and the name of the fixed-sized memory pool are shown in the following format. Icon Name Note that if the name of the fixed-sized memory pool is undefined, the name will appear as "ID".	
		There are waiting tasks.
		There are no waiting tasks.
ID	The ID of the fixed-sized memory pool is shown.	
Queue Status	The current status of the fixed-sized memory pool is shown.	
	Waiting Tasks	There are waiting tasks.
	Empty	There are no waiting tasks.
Top Address	The start address of the fixed-sized memory pool is shown.	
Block Size	The size per block (in bytes) of the fixed-sized memory pool is shown.	

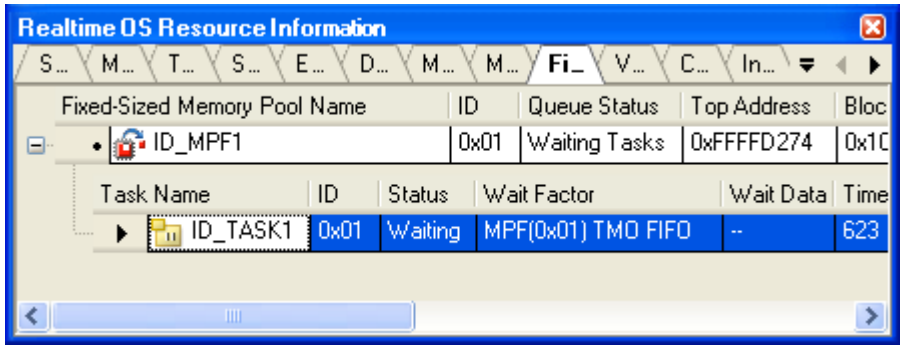
Total Blocks	The block count of the fixed-sized memory pool is shown.	
Free Blocks	The number of free memory blocks is shown.	
Attribute	The task queuing method is shown.	
	TA_TFIFO	FIFO order
	TA_TPRI	Task priority order

(b) Second layer

The waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the fixed-sized memory pool's wait queue.

See the [Task] tab for details about waiting task information.

Figure A-20. [Fixed-Sized Memory Pool] Tab (Waiting Task Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Fixed-Sized Memory Pool Name, ID, Queue Status, Top Address, Block Size, Total Blocks, Free Blocks, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Top Address, Block Size, Total Blocks, Free Blocks	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

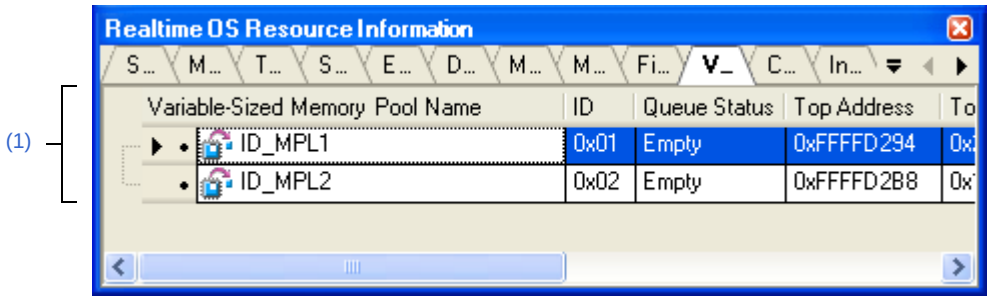
(2) Footer row

Jump to Memory (Top Address)	Opens the Memory panel, and displays the contents of the fixed-sized memory pool.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

[Variable-Sized Memory Pool] tab

This tab displays the variable-sized memory pool information (e.g. Variable-Sized Memory Pool Name and ID) of the RI850V4.

Figure A-21. [Variable-Sized Memory Pool] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the variable-sized memory pool information (e.g. Variable-Sized Memory Pool Name and ID) of the RI850V4.

This layer consists of the following items.

Variable-Sized Memory Pool Name	An icon indicating the current status of the variable-sized memory pool and the name of the variable-sized memory pool are shown in the following format. Icon Name Note that if the name of the variable-sized memory pool is undefined, the name will appear as "ID".	
		There are waiting tasks.
		There are no waiting tasks.
ID	The ID of the variable-sized memory pool is shown.	
Queue Status	The current status of the variable-sized memory pool is shown.	
	Waiting Tasks	There are waiting tasks.
	Empty	There are no waiting tasks.
Top Address	The start address of the variable-sized memory pool is shown.	

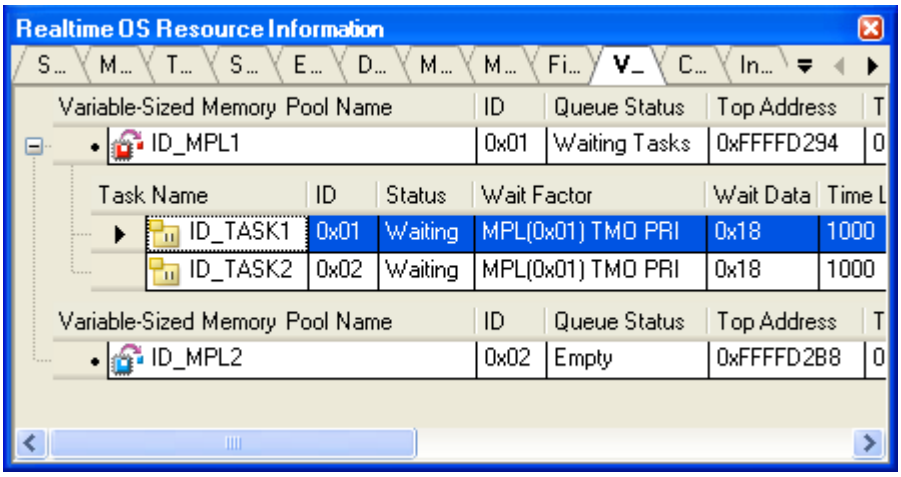
Total Size	The size (in bytes) of the variable-sized memory pool is shown.	
Free Size	The total size (in bytes) of the free memory blocks is shown.	
Available Max Block Size	The maximum memory block size available (in bytes) of the variable-sized memory pool is shown.	
Attribute	The task queuing method is shown.	
	TA_TFIFO	FIFO order
	TA_TPRI	Task priority order

(b) Second layer

The waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the variable-sized memory pool's wait queue.

See the [Task] tab for details about waiting task information.

Figure A-22. [Variable-Sized Memory Pool] Tab (Waiting Task Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Variable-Sized Memory Pool Name, ID, Queue Status, Top Address, Total Size, Free Size, Available Max Block Size, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Top Address, Total Size, Free Size, Available Max Block Size	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

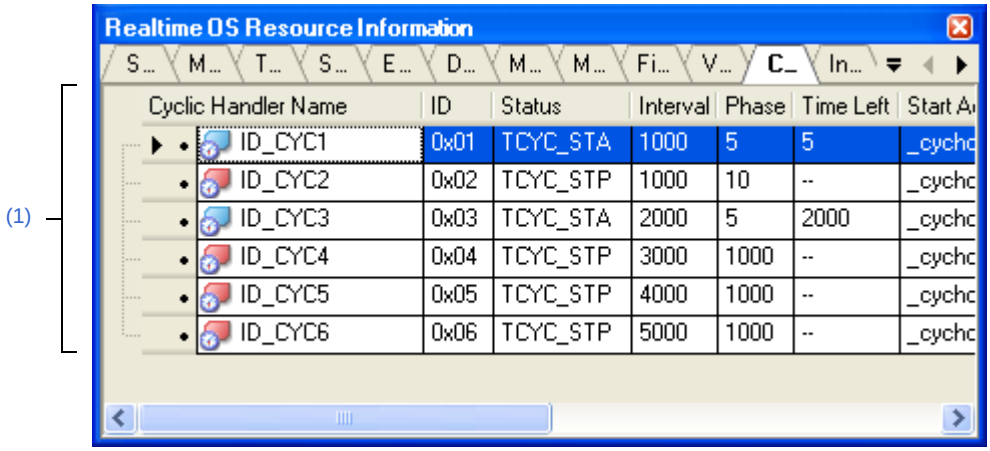
(2) Footer row

Jump to Memory (Top Address)	Opens the Memory panel, and displays the contents of the variable-sized memory pool.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

[Cyclic Handler] tab

This tab displays the cyclic handler information (e.g. Cyclic Handler Name and ID) of the RI850V4.

Figure A-23. [Cyclic Handler] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

This area displays the cyclic handler information (e.g. Cyclic Handler Name and ID) of the RI850V4.
This area consists of the following items.

Cyclic Handler Name	An icon indicating the current status of the cyclic handler and the name of the cyclic handler are shown in the following format. Icon Name Note that if the name of the cyclic handler is undefined, the name will appear as "ID".	
		Non-operational state (STP state)
		Operational state (STA state)
ID	The ID of the cyclic handler is shown.	
Status	The current status of the cyclic handler is shown.	
	TCYC_STP	Non-operational state (STP state)
	TCYC_STA	Operational state (STA state)
Interval	The activation cycle (in milliseconds) of the cyclic handler is shown.	
Phase	The initial activation phase (in milliseconds) of the cyclic handler is shown.	

Time Left	The time left before the next activation (in milliseconds) of the cyclic handler is shown. Note that if the current state of the cyclic handler is "non-operational state" and the existence of saved activation phases is "no saved", "--" appears.	
Start Address	The start address of the cyclic handler is shown.	
Extended Information	The extended information of the cyclic handler is shown.	
Attribute	The attributes of the cyclic handler (coding language of cyclic handler, initial activation state of cyclic handler and existence of saved activation phases) are shown in the following format. Coding language Initial activation state Existence	
	[Coding language of cyclic handler]	
	TA_HLNG	C language
	TA_ASM	Assembly language
	[Initial activation state of cyclic handler]	
	TA_STA	Operational state (STA state)
	Nothing displayed	Non-operational state (STP state)
	[Existence of saved activation phases]	
	TA_PHS	There are saved activation phases.
	Nothing displayed	There are no saved activation phases.

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Cyclic Handler Name, ID, Status, Interval, Phase, Time Left, Start Address, Extended Information, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. ID, Interval, Phase, Time Left, Start Address, Extended Information	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

(2) Footer row

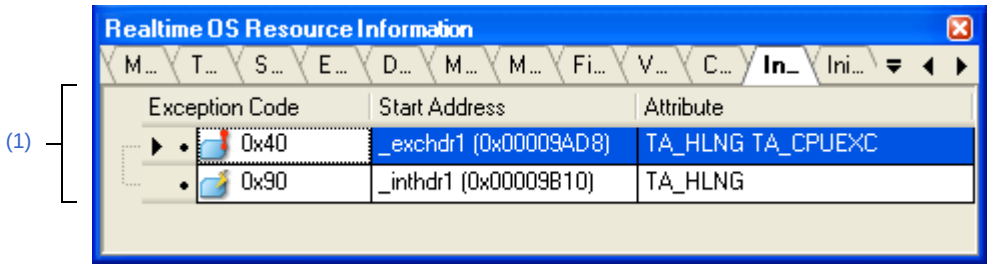
Jump to Source (Start Address)	Opens the Editor panel, and displays the source code of the cyclic handler.
Jump to Disassemble (Start Address)	Opens the Disassemble panel, and displays the results of disassembling the cyclic handler.

Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	sta_cyc	Start cyclic handler operation.
	stp_cyc	Stop cyclic handler operation.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Interrupt Handler] tab

This tab displays the interrupt handler/CPU exception handler information (e.g. Exception Code and Start Address) of the RI850V4.

Figure A-24. [Interrupt Handler] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

This area displays the interrupt handler/CPU exception handler information (e.g. Exception Code and Start Address) of the RI850V4.

This area consists of the following items.

Exception Code	An icon indicating the type of the handler and the exception code are shown in the following format. Icon Exception code	
		CPU exception handler
		Interrupt handler
Start Address	The start address of the interrupt handler/CPU exception handler is shown.	
Attribute	The attributes of the interrupt handler/CPU exception handler (coding language of interrupt handler/CPU exception handler and type of handler) are shown in the following format. Coding language Type	
	[Coding language of interrupt handler/CPU exception handler]	
	TA_HLNG	C language
	TA_ASM	Assembly language
	[Type of handler]	
	TA_CPUEXC	CPU exception handler

	Nothing displayed	Interrupt handler

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Exception Code, Start Address, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. Exception Code, Start Address	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

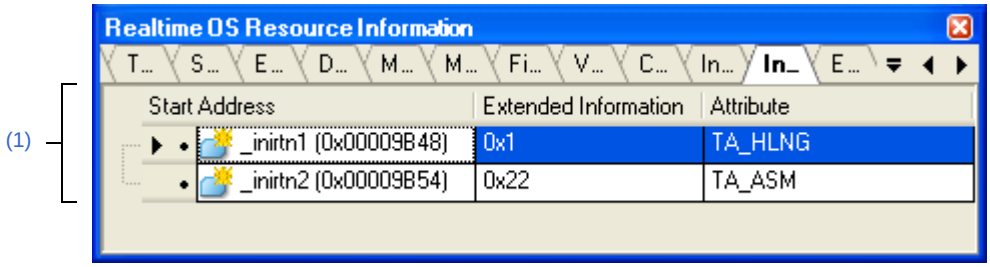
(2) Footer row

Jump to Source (Start Address)	Opens the Editor panel, and displays the source code of the interrupt handler/CPU exception handler.
Jump to Disassemble (Start Address)	Opens the Disassemble panel, and displays the results of disassembling the interrupt handler/CPU exception handler.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

[Initialize Routine] tab

This tab displays the initialize routine information (e.g. Start Address and Extended Information) of the RI850V4.

Figure A-25. [Initialize Routine] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

This area displays the initialize routine information (e.g. Start Address and Extended Information) of the RI850V4.
This area consists of the following items.

Start Address	The start address of the initialize routine is shown.	
Extended Information	The extended information of the initialize routine is shown.	
Attribute	The coding language of the initialize routine is shown.	
	TA_HLNG	C language
	TA_ASM	Assembly language

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Start Address, Extended Information, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.

Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. Start Address, Extended Information	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

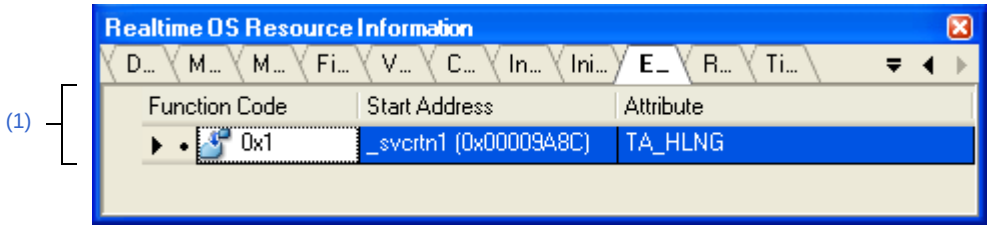
(2) Footer row

Jump to Source (Start Address)	Opens the Editor panel, and displays the source code of the initialize routine.
Jump to Disassemble (Start Address)	Opens the Disassemble panel, and displays the results of disassembling the initialize routine.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

[Extended Service Call Routine] tab

This tab displays the extended sevice call routine information (e.g. Function Code and Start Address) of the RI850V4.

Figure A-26. [Extended Service Call Routine] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

This area displays the extended sevice call routine information (e.g. Function Code and Start Address) of the RI850V4.

This area consists of the following items.

Function Code	The function code of the extended service call routine is shown.	
Start Address	The start address of the extended service call routine is shown.	
Attribute	The coding language of the extended service call routine is shown.	
	TA_HLNG	C language
	TA_ASM	Assembly language

[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Function Code, Start Address, Attribute	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.

Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. Function Code, Start Address	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

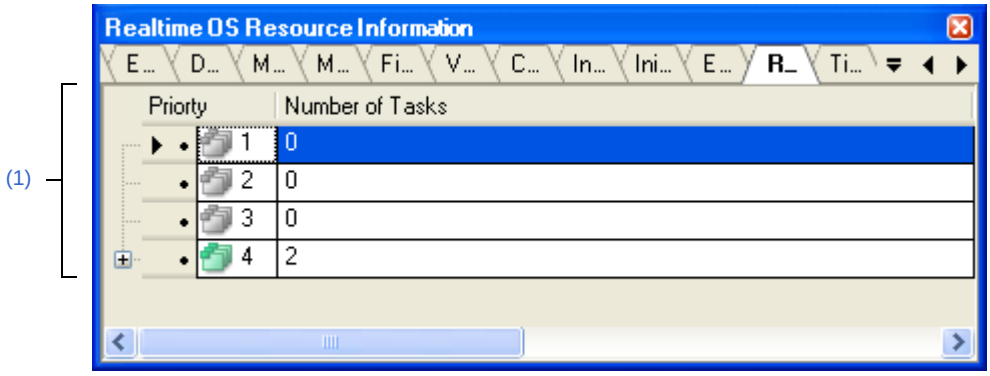
(2) Footer row

Jump to Source (Start Address)	Opens the Editor panel, and displays the source code of the extended service call routine.
Jump to Disassemble (Start Address)	Opens the Disassemble panel, and displays the results of disassembling the extended service call routine.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

[Ready Queue] tab

This tab displays the ready queue information (e.g. Priority and Number of Tasks) of the RI850V4.

Figure A-27. [Ready Queue] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

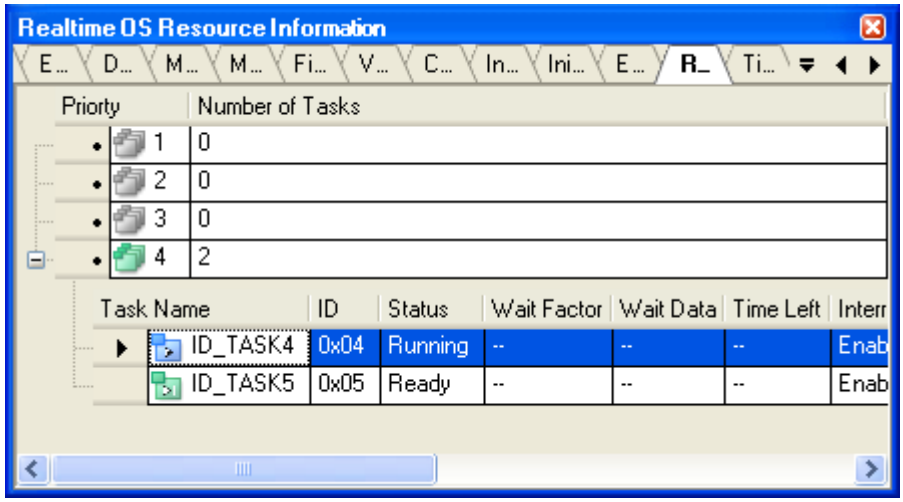
This layer displays the ready queue information (e.g. Priority and Number of Tasks) of the RI850V4.
This layer consists of the following items.

Priority	An icon indicating the current status of the ready queue and the task priority are shown in the following format. Icon Task priority	
		There are queued tasks.
		There are no queued tasks.
Number of Tasks	The total number of queued tasks (tasks with of READY state or RUNNING state) is shown.	

(b) Second layer

The executing task information (e.g. Task Name and ID) only appears if there are tasks queued in the ready queue.
See the [Task] tab for details about executing task information.

Figure A-28. [Ready Queue] Tab (Executing Task Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.	
Selected item name	The following items are displayed for selection. Priority, Number of Tasks	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. Priority, Number of Tasks	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

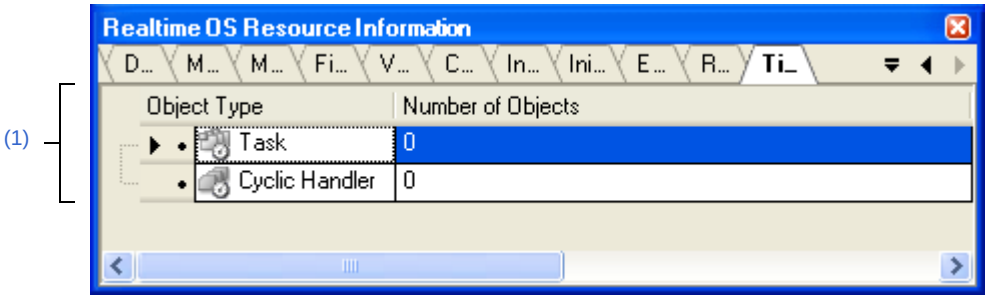
(2) Footer row

Service Call	Displays the types of service calls that can be issued. Note that if a service call is not embedded in (linked to) the downloaded program, or the necessary conditions for executing the service-call process are not met, then the service call will be grayed out.	
	rot_rdq	Rotate task Precedence.
Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).	

[Timer Queue] tab

This tab displays the timer queue information (e.g. Object Type and Number of Objects) of the RI850V4.

Figure A-29. [Timer Queue] Tab



The following items are explained here.

- [How to open]
- [Description of each area]
- [Context menu]

[How to open]

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

[Description of each area]

(1) Information display area

(a) First layer

This layer displays the timer queue information (e.g. Object Type and Number of Objects) of the RI850V4.
This layer consists of the following items.

Object Type	An icon indicating the current status of the timer queue and the object type are shown in the following format. Icon Object type	
	[Icon]	
		There are queued tasks.
		There are no queued tasks.
		There are queued cyclic handlers.
		There are no queued cyclic handlers.
	[Object type]	
	Task	Task
	Cyclic Handler	Cyclic handler
Number of Objects	The total number of queued objects (tasks and cyclic handlers) is shown.	

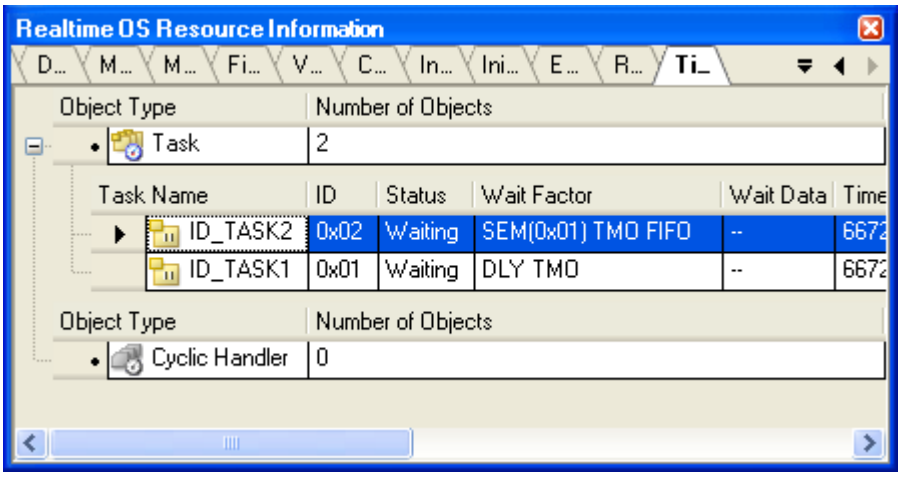
(b) Second layer

<1> Waiting task information

The waiting task information (e.g. Task Name and ID) only appears if there are tasks queued in the timer queue.

See the [Task] tab for details about waiting task information.

Figure A-30. [Timer Queue] Tab (Waiting Task Information)

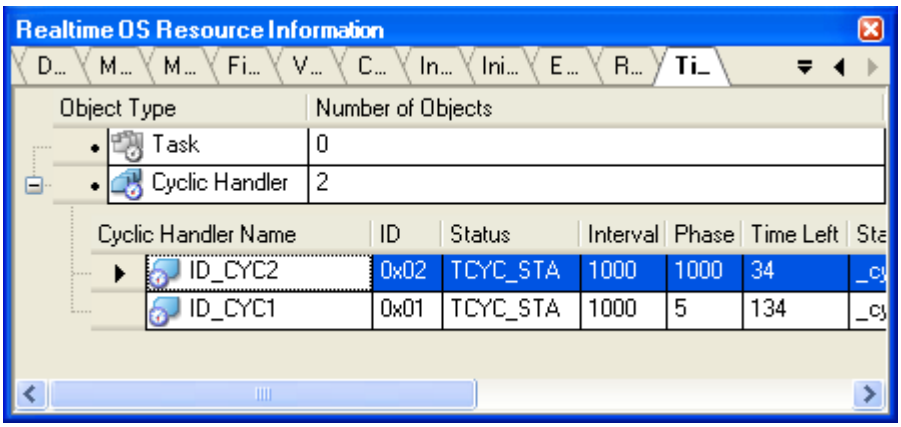


<2> Cyclic handler information

The cyclic handler information (e.g. Cyclic Handler Name and ID) only appears if there are cyclic handlers queued in the timer queue.

See the [Cyclic Handler] tab for details about cyclic handler information.

Figure A-31. [Timer Queue] Tab (Cyclic Handler Information)



[Context menu]

The context menu displayed in response to a right mouse click differs as follows depending on the area clicked.

(1) Header row

Display	Displays cascade menus for selecting the header items to display.

Selected item name	The following items are displayed for selection. Object Type, Number of Objects	
	Checked	The item in question will be displayed.
	Not checked	The item in question will not be displayed.
Notation	Displays cascade menus for selecting the display notation.	
Selected item name	The following items are displayed for selection. Number of Objects	
	DEC	Displays value in signed decimal number.
	HEX	Displays value in hexadecimal number.

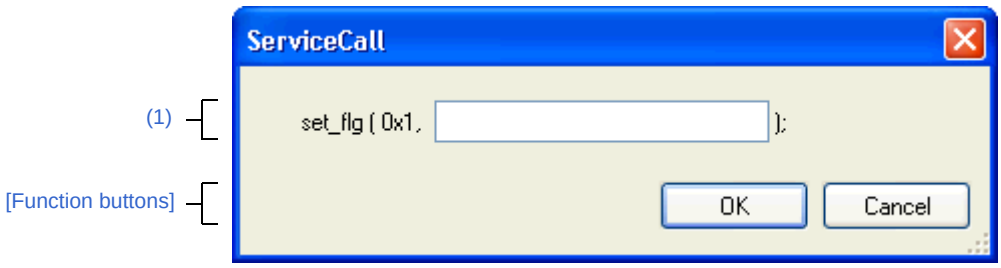
(2) Footer row

Reset Display Item	Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).

ServiceCall dialog box

Execute a service call process.

Figure A-32. ServiceCall Dialog Box



The following items are explained here.

- [How to open]
- [Description of each area]
- [Function buttons]

[How to open]

- From the Realtime OS Resource Information panel context menu, select [Service Call] >> [*Service Call Name*].

[Description of each area]

(1) Service call display area

This area displays the service call selected in the context menu, in C format.

Remark If the service call requires a value to be input, a text box will appear in this area. Enter the value in question, then click [OK] to run the service call process.

[Function buttons]

Button	Function
OK	Execute a service call process.
Cancel	Ignore the setting and closes this dialog box. The function of this item is same as that of the button.

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Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Oct 01, 2011	-	First Edition issued
1.01	Apr 01, 2012	18	[System] tab Added the following: the sentence in the "[Context menu]" column - item "(2)". Reset Display Item Resets the display item (e.g. whether or not to display header items, display notation, display order and display width).
		23	[Task] tab Changed as follows: the sentence in the "[Description of each area]" column - item "(1)" - "(a)" - "Time Left". Note that if the current state of the task is other than delayed state, "0" appears. -->Note that if the task is waiting forever, "TMO_FEVR" appears. If the current state of the task is other than WAITING state or WAITING-SUSPENDED state, "--" appears.
		36	[Mailbox] tab Changed as follows: the sentence in the "[Description of each area]" column - item "(1)" - "(a)" - "Message Max Priority". ... is FIFO order, "0x0" appears. --> ... is TA_MFIFO, "--" appears.
		40	[Mutex] tab Changed as follows: the sentence in the "[Description of each area]" column - item "(1)" - "(a)" - "Ceiling Priority". "0" is shown. --> "--" is shown.
		47	[Cyclic Handler] tab Changed as follows: the sentence in the "[Description of each area]" column - item "(1)" - "Time Left". ... is non-operational state, "0" appears. --> ... is "non-operational state" and the existence of saved activation phases is "no saved", "--" appears.

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Debug

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