To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

Send any inquiries to http://www.renesas.com/inquiry.

Notice

1. All information included in this document is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas Electronics products listed herein, please confirm the latest product information with a Renesas Electronics sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas Electronics such as that disclosed through our website.
2. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
3. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part.
4. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
5. When exporting the products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. You should not use Renesas Electronics products or the technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
7. Renesas Electronics products are classified according to the following three quality grades: "Standard", "High Quality", and "Specific". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below. You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application categorized as "Specific" without the prior written consent of Renesas Electronics. Further, you may not use any Renesas Electronics product for any application for which it is not intended without the prior written consent of Renesas Electronics. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for an application categorized as "Specific" or for which the product is not intended where you have failed to obtain the prior written consent of Renesas Electronics. The quality grade of each Renesas Electronics product is "Standard" unless otherwise expressly specified in a Renesas Electronics data sheets or data books, etc.

   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots.

   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; safety equipment; and medical equipment not specifically designed for life support.

   "Specific": Aircraft; aerospace equipment; submersible repeaters; nuclear reactor control systems; medical equipment or systems for life support (e.g. artificial life support devices or systems), surgical implantations, or healthcare intervention (e.g. excision, etc.), and any other applications or purposes that pose a direct threat to human life.
8. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

Real-time OS RI600/4 for RX600 Series

Application Transition Guide (M3T-MR30/4 → RI600/4)

This document gives useful information about the transition of C-language applications from M3T-MR30/4 to RI600/4, especially regarding the specifications changed from M3T-MR30/4 to RI600/4.

Contents

1. Overview

Figure 1 gives an overview of application asset transition from M3T-MR30/4 to RI600/4.

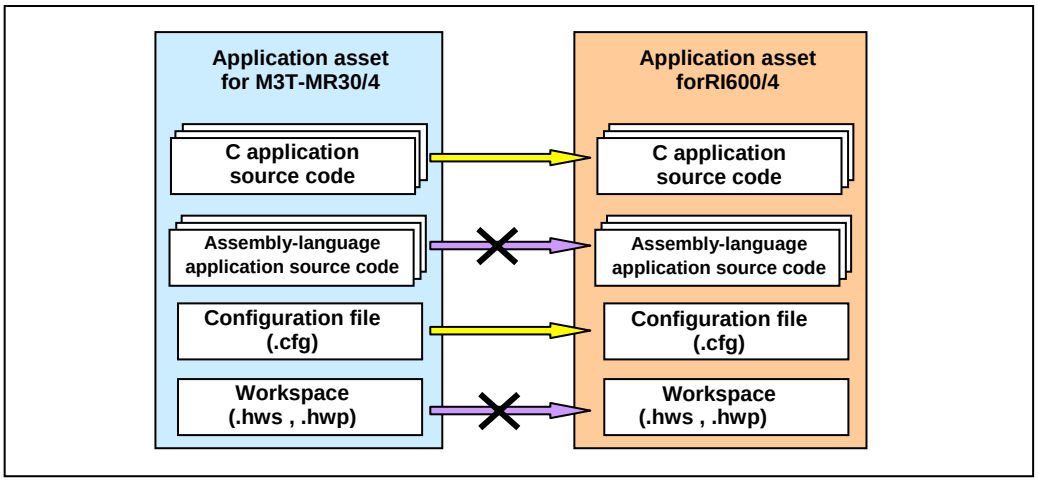

Figure 1 Overview of Application Asset Transition

(1) C Application Source Code

Some parts of the C source code that are related to the compiler differences should be modified in some cases.
In addition, the code should be modified as necessary in accordance with the differences between OS specifications described in the following sections.

(2) Assembly-Language Application Source Code

The assembly languages of the M16C family and RX family are not compatible; a new assembly-language code should be created for the RX family.

(3) Configuration File (.cfg)

Although the configuration files are compatible, be sure to modify the items related to the differences between the M3T-MR30/4 and RI600/4 specifications.

(4) Workspace (.hws, .hwp)

Due to the specifications of High-performance Embedded Workshop, the workspace created for the M16C family cannot be used for the RX family; a new workspace should be created for the RX family.

2. Parameter Data Type and Size

Table 1 shows the differences in each parameter data type and size between M3T-MR30/4 and RI600/4.
When the application uses the data types shaded in the table, check and change the code where such data types are used.
Note especially that the FLGPTN type (eventflag bit pattern) has been changed from 16 bits to 32 bits.

Table 1 Differences of Basic Data Types

	Type	M3T-MR30/4	Remarks	RI600/4	Difference from M3T-MR30/4
itron.h	B	signed char B;		signed char B;	
	H	signed short H;		signed short H;	
	W	signed long W;		signed long W;	
	D	signed long long D;		signed long long D;	
	UB	unsigned char UB;		unsigned char UB;	
	UH	unsigned short UH;		unsigned short UH;	
	UW	unsigned long UW;		unsigned long UW;	
	UD	unsigned long long UD;		unsigned long long UD;	
	VB	signed char VB;		signed char VB;	
	VH	signed short VH;		signed short VH;	
	VW	signed long VW;		signed long VW;	
	VD	signed long long VD;		signed long long VD;	
	VP	void _near * VP;		void *VP;	
	FP	void (*FP)(void);		void (*FP)(void);	
	INT	int INT;		W INT;	16 bits → 32 bits
	UINT	unsigned int UINT;		UW UINT;	16 bits → 32 bits
	BOOL	(Not defined)		W BOOL;	Added
	ER	INT ER;		W ER;	16 bits → 32 bits
	ID	INT ID;		H ID;	
	ATR	UINT ATR;		UH ATR;	
	STAT	UINT STAT;		UH STAT;	
	MODE	UINT MODE;		UH MODE;	
	PRI	UINT PRI;		H PRI;	
	SIZE	UINT SIZE;		UW SIZE;	16 bits → 32 bits
	TMO	W TMO;		W TMO;	
	RELTIM	UW RELTIM;		UW RELTIM;	
	SYSTIM	typedef struct { UH utime; UW ltime; } SYSTIM;		typedef struct { UH utime; UW ltime; } SYSTIM;	
	VP_INT	INT VP_INT;		W VP_INT;	
	ER_UINT	INT ER_UINT;		W ER_UINT;	16 bits → 32 bits
	FLGPTN	UINT FLGPTN;		UW FLGPTN	16 bits → 32 bits

3. Functions Deleted or Diminished in RI600/4

3.1 long Data Queue

RI600/4 does not support the long data queue.
As the size of the standard data queue is 32 bits in RI600/4, modify applications that use long data queues so that they use standard data queues.

4. Procedure for Disabling Interrupts

The procedure for disabling interrupts differs between M3T-MR30/4 and RI600/4. Use any of the following ways to disable interrupts.

(a) Specify the CPU-locked state.
(b) Use chg_ims or ichg_ims to change the IPL.
(c) Directly modify the I bits and IPL (only in non-task contexts).

For details, refer to section 3.7.3, Disabling Interrupts, in the RI600/4 User's Manual.

5. Dispatching-Disabled State

5.1 Service Call in Dispatching-Disabled State

When a service call that may cause a transition to a wait state is invoked in dispatching-disabled state in RI600/4, the E_CTX will be returned.
If such a service call may be invoked in dispatching-disabled state in the application, consider the return value in implementation.

5.2 Cancelling Dispatching-Disabled State

In RI600/4, dispatching-disabled state can be cancelled through the following three steps.
Only steps (1) and (2) are required in M3T-MR30/4, but the additional step (3) is necessary in RI600/4.

(1) Invoke the ena_dsp service call
(2) Invoke the ext_tsk service call (including the return from the task entry function)
(3) Change the interrupt mask (IPL bit in the PSW register) to 0 through the chg_ims service call

6. Return Code

The following codes are added as the return value from service calls in RI600/4.

- E_CTX: Invocation from an unallowed system state
- E_PAR: Parameter error
- E_ID: Invalid ID

7. Section

The section names used and section definitions differ between RI600/4 and M3T-MR30/4.
Allocate the sections to appropriate addresses.

M3T-MR30/4

MR_RAM_DBG section
MR_RAM section
MR_HEAP section
MR_KERNEL section
MR_CIF section
MR_ROM section
stack section (task stack)

RI600/4

PRI_KERNEL section
CRI_ROM section
SURI_STACK section (task stack)
BRI_RAM section
BRI_HEAP section

8. Interrupt Definition in cfg File

In RI600/4, the definition range for the "switch passed to PRAGMA extension function (pragma_switch)" has been changed, which should be specified in the variable-sized interrupt vector definition (interrupt_vector[ ]) and fixed-sized interrupt vector definition (interrupt_fvector[ ]) through the configurator (cfg600).

Definition Range

- B: Deleted in RI600/4.
- F: Added in RI600/4.
  The "fint" switch that specifies a fast interrupt is passed.
- S: Added in RI600/4.
  The "save" switch that limits the number of registers used by the interrupt handler is passed.

9. Information on Build

9.1 Notes on Project Transition from M3T-MR30/4 to RI600/4

The project for M3T-MR30/4 cannot be used for RI600/4 due to the specifications of High-performance Embedded Workshop, so a new RI600/4 project should be created.
Through High-performance Embedded Workshop provided in the RX family compiler package, a template project for RI600/4 can be created. Create a project by using this function, then add the necessary application files and modify option settings.
The following describes important items that need special care.

9.1.1 Notes on Reset

(1) Reset Function Name and Source File

The reset function in M3T-MR30/4 is __SYS_INITIAL in crt0mr.a30 in the provided sample.
In RI600/4, the reset function is PowerON_Reset_PC( ) in resetprg.c, which is generated by the RI/600 project creation function of High-performance Embedded Workshop.

(2) Role of resetprg.c in RI600/4

The resetprg.c described above contains the following in addition to the reset function.

- System-down routine
- Inclusion of system definition files (kernel_rom.h and kernel_ram.h) output by cfg600
  kernel_rom.h and kernel_ram.h have the same function as sys_rom.inc and sys_ram.inc in M3T-MR30/4.
  For resetprg.c, compiler option "-nostuff" should be specified.
  For details, refer to section 7.2, Creating Startup File (resetprg.c), in the RI600/4 User's Manual.

9.1.2 Compiler Options

In RI600/4, the "-ri600_preinit_mrc" option should be specified for all files that include kernel.h.
For resetprg.c described above, the "-nostuff" option should be specified.

9.1.3 Correspondence of Files

The following shows the M3T-MR30/4 sample files and their corresponding items in RI600/4.

#	Item	M3T-MR30/4 Sample Files	RI600/4
1	Common type definition	(None)	typedefine.h *
2	I/O definition	(None)	iodefine.h *
3	Reset	crt0mr.a30	resetprg.c *, hwsetup.c *
4	System-down routine	(None)	resetprg.c *
5	Undefined interrupt	crt0mr.a30	Generated by cfg600 and output to ri600.inc
6	Timer driver	(None)	ri_cmt.h generated by cfg600
7	Section initialization	crt0mr.a30	dbsct.c *
8	Low-level standard I/O functions	(None)	lowsrc.h *, lowsrc.c *, lowlvl.src *
9	Low-level memory management functions for standard library	(None)	sbrk.h *, sbrk.c *
10	cfg file	template.cfg	<project name>.cfg
11	Vector table	vector.tpl is generated by cfg30. Inputting it to mkritbl generates a vector table in mrtable.a30.	vector.tpl is generated by cfg600. Inputting it to mkritbl generates a vector table in ritable.src.
12	Header file	mr30¥itron.h	inc600¥itron.h
13	Header file	mr30¥kernel.h	inc600¥kernel.h
14	ID name header file	kernel_id.h generated by cfg30	kernel_id.h generated by cfg600
15	Kernel configuration macros for application	kernel_id.h generated by cfg30 (not to be included in kernel.h)	kernel_id.h generated by cfg600 (not to be included in kernel.h)
16	System definition file	(1) sys_rom.inc and sys_ram.inc generated by cfg30 (to be included in crt0mr.a30) (2)mr30.inc generated by cfg30 (to be included in crt0mr.a30)	(1) kernel_rom.h and kernel_ram.h generated by cfg600 (to be included in resetprg.c) (2) ri600.inc generated by cfg600 (to be included in ritable.src, which is output by mkritbl)
17	Kernel library	lib30¥mr30.lib lib30¥c30mr.lib	lib600¥ri600big.lib (big endian) lib600¥ri600lit.lib (little endian)

Note: * indicates a file that is generated by the RI600/4 project creation function [1] of High-performance Embedded Workshop

[1] High-performance Embedded Workshop does not support this function as of publication of this document.

10. Comparison of Specifications

Item		M3T-MR30/4	RI600/4	Supplementary Description of Difference from M3T-MR30/4	Remarks
Configuration information input		Write to cfg file	Either of the following two ways (1) Input to the GUI configurator (2) Write to the cfg file		
Data type		See section 2, Parameter Data Type and Size			
Task management	Task ID	1 to 255	1 to 255		
	Task priority	1 to 255	1 to 255		
	Activation count	15	255	Increased	
	Extended information	16 bits	32 bits	16 bits → 32 bits	See section 2, Parameter Data Type and Size
	Attribute	TA_HLNG TA_ASM	TA_HLNG TA_ASM		
	Shared stack	None	None		
	act_tsk	TEDU	TEDU		
	iact_tsk	NEDU	NEDU		
	can_act	TEDU	TEDU		
	ican_act	NEDU	NEDU		
	sta_tsk	TEDU	TEDU		
	ista_tsk	NEDU	NEDU		
	ext_tsk	TEDUL	TEDUL		
	ter_tsk	TEDU	TEDU		
	chg_pri	TEDU	TEDU		
	ichg_pri	NEDU	NEDU		
	get_pri	TEDU	TEDU		
	iget_pri	NEDU	NEDU		
	ref_tsk	TEDU	TEDU		
	iref_tsk	NEDU	NEDU		
	ref_tst	TEDU	TEDU		
	iref_tst	NEDU	NEDU		
Task-dependent synchronization	Wakeup count	15	255	Increased	
	Suspension count	1	1		
	slp_tsk	TEU	TEU		
	tslp_tsk	TEU	TEU		
	wup_tsk	TEDU	TEDU		
	iwup_tsk	NEDU	NEDU		
	can_wup	TEDU	TEDU		
	ican_wup	NEDU	NEDU		
	rel_wai	TEDU	TEDU		
	irel_wai	NEDU	NEDU		
	sus_tsk	TEDU	TEDU		
	isus_tsk	NEDU	NEDU		
	rsm_tsk	TEDU	TEDU		
	irsm_tsk	NEDU	NEDU		
	frsm_tsk	TEDU	TEDU		
	ifrsm_tsk	NEDU	NEDU		
	dly_tsk	TEU	TEU		
Semaphore	ID number	1 to 255	1 to 255		
	Maximum counter value	65535	65535		
	Attribute	TA_TFIFO TA_TPRI	TA_TFIFO TA_TPRI		
	sig_sem	TEDU	TEDU		
	isig_sem	NEDU	NEDU		

Item		M3T-MR30/4	RI600/4	Supplementary Description of Difference from M3T-MR30/4	Remarks
	wai_sem	TEU	TEU		
	pol_sem	TEDU	TEDU		
	ipol_sem	NEDU	NEDU		
	twai_sem	TEU	TEU		
	ref_sem	TEDU	TEDU		
	iref_sem	NEDU	NEDU		
Eventflag	ID number	1 to 255	1 to 255		
	Flag length	16 bits	32 bits	16 bits → 32 bits	See section 2, Parameter Data Type and Size
	Attribute	TA_TFIFO TA_TPRI TA_WSGL TA_WMUL TA_CLR	TA_TFIFO TA_TPRI TA_WSGL TA_WMUL TA_CLR		
	set_flg	TEDU	TEDU		
	iset_flg	NEDU	NEDU		
	clr_clg	TEDU	TEDU		
	iclr_flg	NEDU	NEDU		
	wai_flg	TEU	TEU		
	pol_flg	TEDU	TEDU		
	ipol_flg	NEDU	NEDU		
	twai_flg	TEU	TEU		
	ref_flg	TEDU	TEDU		
	iref_flg	NEDU	NEDU		
Data queue	ID number	1 to 255	1 to 255		
	Data length	16 bits	32 bits	16 bits → 32 bits	
	Attribute	TA_TFIFO TA_TPRI	TA_TFIFO TA_TPRI		
	snd_dtq	TEU	TEU		
	psnd_dtq	TEDU	TEDU		
	ipsnd_dtq	NEDU	NEDU		
	tsnd_dtq	TEU	TEU		
	fsnd_dtq	TEDU	TEDU		
	ifsnd_dtq	NEDU	NEDU		
	rcv_dtq	TEU	TEU		
	prcv_dtq	TEDU	TEDU		
	iprcv_dtq	NEDU	NEDU		
	trcv_dtq	TEU	TEU		
	ref_dtq	TEDU	TEDU		
	iref_dtq	NEDU	NEDU		
Mailbox	ID number	1 to 255	1 to 255		
	MSG priority	1 to 255	1 to 255		
	Attribute	TA_TFIFO TA_TPRI TA_MFIFO TA_MPRI	TA_TFIFO TA_TPRI TA_MFIFO TA_MPRI		
	snd_mbx	TEDU	TEDU		
	isnd_mbx	NEDU	NEDU		
	rcv_mbx	TEU	TEU		
	prcv_mbx	TEDU	TEDU		
	iprcv_mbx	NEDU	NEDU		
	trcv_mbx	TEU	TEU		
	ref_mbx	TEDU	TEDU		
	iref_mbx	NEDU	NEDU		
Mutex	ID number	(Not supported)	1 to 255	Mutex function is added	
	Attribute		TA_CEILING		
	loc_mtx		TEU		

Item		M3T-MR30/4	RI600/4	Supplementary Description of Difference from M3T-MR30/4	Remarks
	ploc_mtx		TEDU		
	tloc_mtx		TEU		
	unl_mtrx		TEDU		
	ref_mtx		TEDU		
Message buffer	ID number	(Not supported)	1 to 255	Message buffer function is added	
	Attribute		TA_TFIFO		
	snd_mbf		TEU		
	psnd_mbf		TEDU		
	ipsnd_mbf		NEDU		
	tsnd_mbf		TEU		
	rcv_mbf		TEU		
	prcv_mbf		TEDU		
	trcv_mbf		TEU		
	ref_mbf		TEDU		
	iref_mbf		NEDU		
Fixed-sized memory pool	ID number	1 to 255	1 to 255		
	Maximum block count	65535	65535		
	Maximum block size	65535	65535		
	Attribute	TA_TFIFO TA_TPRI	TA_TFIFO TA_TPRI		
	get_mpf	TEU	TEU		
	pget_mpf	TEDU	TEDU		
	ipget_mpf	NEDU	NEDU		
	tget_mpf	TEU	TEU		
	rel_mpf	TEDU	TEDU		
	irel_mpf	NEDU	NEDU		
	ref_mpf	TEDU	TEDU		
	iref_mpf	NEDU	NEDU		
Variable-sized memory pool	ID number	1 to 255	1 to 255		
	Maximum pool size	65535	256MB	• 64 KB → 256 MB	
	Maximum size of allocatable block	65520	0xBFFFFF4		
	Attribute	TA_TFIFO	TA_TFIFO		
	get_mpl	(Not supported)	TEU		
	pget_mpl	TEDU	TEDU		
	ipget_mpl	(Not supported)	NEDU		
	tget_mpl	(Not supported)	TEU		
	rel_mpl	TEDU	TEDU		
	ref_mpl	TEDU	TEDU		
	iref_mpl	NEDU	NEDU		
Time management	System time	Unsigned 48 bits	Unsigned 48 bits		
	Unit time	1ms	1ms		
	Update cycle of system time	User specification [ms]	TIC_NUME /TIC_DENO[ms]		
	set_tim	TEDU	TEDU		
	iset_tim	NEDU	NEDU		
	get_tim	TEDU	TEDU		
	iget_tim	NEDU	NEDU		
Cyclic handler	ID number	1 to 255	1 to 255		
	Extended information	16 bits	32 bits	16 bits → 32 bits	See section 2, Parameter Data Type and Size

Item		M3T-MR30/4	RI600/4	Supplementary Description of Difference from M3T-MR30/4	Remarks
	Attribute	TA_HLNG TA_ASM TA_STA TA_PHS	TA_HLNG TA_ASM TA_STA TA_PHS		
	sta_cyc	TEDU	TEDU		
	ista_cyc	NEDU	NEDU		
	stp_cyc	TEDU	TEDU		
	istp_cyc	NEDU	NEDU		
	ref_cyc	TEDU	TEDU		
	iref_cyc	NEDU	NEDU		
Alarm handler	ID number	1 to 255	1 to 255		
	Extended information	16 bits	32 bits	16 bits → 32 bits	See section 2, Parameter Data Type and Size
	Attribute	TA_HLNG TA_ASM	TA_HLNG, TA_ASM		
	sta_alm	TEDU	TEDU		
	ista_alm	NEDU	NEDU		
	stp_alm	TEDU	TEDU		
	istp_alm	NEDU	NEDU		
	ref_alm	TEDU	TEDU		
	iref_alm	NEDU	NEDU		
System state management	rot_rdq	TEDU	TEDU		
	irot_rdq	NEDU	NEDU		
	get_tid	TEDU	TEDU		
	iget_tid	NEDU	NEDU		
	loc_cpu	TEDUL	TEDUL		
	iloc_cpu	NEDUL	NEDUL		
	unl_cpu	TEDUL	TEDUL		
	iunl_cpu	NEDUL	NEDUL		
	dis_dsp	TEDU	TEDU		
	ena_dsp	TEDU	TEDU		
	sns_ctx	TNEDUL	TNEDUL		
	sns_loc	TNEDUL	TNEDUL		
	sns_dsp	TNEDUL	TNEDUL		
	sns_dpn	TNEDUL	TNEDUL		
	vsta_knl	Not supported	Supported	Added	
	ivsta_knl	Not supported	Supported	Added	
	vsys_dwn	(Not supported)	TEDUL	Added	
	ivsys_dwn	(Not supported)	NEDUL	Added	
Interrupt management	chg_ims	(Not supported)	TEDU	Added	
	ichg_ims	(Not supported)	NEDU	Added	
	get_ims	(Not supported)	TEDU	Added	
	iget_ims	(Not supported)	NEDU	Added	
	ret_int	N	N		
System configuration management	ref_ver	TEDU	TEDU		
	iref_ver	NEDU	NEDU		
long data queue	snd_dtq	TEU	(Not supported)	Deleted	
	psnd_dtq	TEDU			
	ipsnd_dtq	NEDU			
	tsnd_dtq	TEU			
	fsnd_dtq	TEDU			
	ifsnd_dtq	NEDU			
	rcv_dtq	TEU			
	prcv_dtq	TEDU			
	iprcv_dtq	NEDU			
	trcv_dtq	TEU			
	ref_dtq	TEDU			

Item		M3T-MR30/4	RI600/4	Supplementary Description of Difference from M3T-MR30/4	Remarks
	iref_dtq	NEDU			
Object reset function	vrst_dtq	TEDU	TEDU		
	vrst_mbx	TEDU	TEDU		
	vrst_mpf	TEDU	TEDU		
	vrst_mpl	TEDU	TEDU		
	vrst_mbf	TEDU	TEDU		

Note: N: Invocable from non-task contexts
T: Invocable from task contexts
E: Invocable from a dispatching-enabled state
D: Invocable from a dispatching-disabled state
U: Invocable from the CPU-unlocked state
L: Invocable from the CPU-locked state

Website and Support

Renesas Technology Website
http://www.renesas.com/

Inquiries
http://www.renesas.com/inquiry
csc@renesas.com

Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Feb. 16, 2010.	—	First edition issued

Notes regarding these materials

1. This document is provided for reference purposes only so that Renesas customers may select the appropriate Renesas products for their use. Renesas neither makes warranties or representations with respect to the accuracy or completeness of the information contained in this document nor grants any license to any intellectual property rights or any other rights of Renesas or any third party with respect to the information in this document.
2. Renesas shall have no liability for damages or infringement of any intellectual property or other rights arising out of the use of any information in this document, including, but not limited to, product data, diagrams, charts, programs, algorithms, and application circuit examples.
3. You should not use the products or the technology described in this document for the purpose of military applications such as the development of weapons of mass destruction or for the purpose of any other military use. When exporting the products or technology described herein, you should follow the applicable export control laws and regulations, and procedures required by such laws and regulations.
4. All information included in this document such as product data, diagrams, charts, programs, algorithms, and application circuit examples, is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas products listed in this document, please confirm the latest product information with a Renesas sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas such as that disclosed through our website. (http://www.renesas.com)
5. Renesas has used reasonable care in compiling the information included in this document, but Renesas assumes no liability whatsoever for any damages incurred as a result of errors or omissions in the information included in this document.
6. When using or otherwise relying on the information in this document, you should evaluate the information in light of the total system before deciding about the applicability of such information to the intended application. Renesas makes no representations, warranties or guaranties regarding the suitability of its products for any particular application and specifically disclaims any liability arising out of the application and use of the information in this document or Renesas products.
7. With the exception of products specified by Renesas as suitable for automobile applications, Renesas products are not designed, manufactured or tested for applications or otherwise in systems the failure or malfunction of which may cause a direct threat to human life or create a risk of human injury or which require especially high quality and reliability such as safety systems, or equipment or systems for transportation and traffic, healthcare, combustion control, aerospace and aeronautics, nuclear power, or undersea communication transmission. If you are considering the use of our products for such purposes, please contact a Renesas sales office beforehand. Renesas shall have no liability for damages arising out of the uses set forth above.
8. Notwithstanding the preceding paragraph, you should not use Renesas products for the purposes listed below:
   (1) artificial life support devices or systems
   (2) surgical implantations
   (3) healthcare intervention (e.g., excision, administration of medication, etc.)
   (4) any other purposes that pose a direct threat to human life

   Renesas shall have no liability for damages arising out of the uses set forth in the above and purchasers who elect to use Renesas products in any of the foregoing applications shall indemnify and hold harmless Renesas Technology Corp., its affiliated companies and their officers, directors, and employees against any and all damages arising out of such applications.
9. You should use the products described herein within the range specified by Renesas, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas shall have no liability for malfunctions or damages arising out of the use of Renesas products beyond such specified ranges.
10. Although Renesas endeavors to improve the quality and reliability of its products, IC products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other applicable measures. Among others, since the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
11. In case Renesas products listed in this document are detached from the products to which the Renesas products are attached or affixed, the risk of accident such as swallowing by infants and small children is very high. You should implement safety measures so that Renesas products may not be easily detached from your products. Renesas shall have no liability for damages arising out of such detachment.
12. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written approval from Renesas.
13. Please contact a Renesas sales office if you have any questions regarding the information contained in this document, Renesas semiconductor products, or if you have any other inquiries.