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April 1st, 2010
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R32C/100 Series

Protect Operation

1. Abstract

This document describes the protect operation.

2. Introduction

The application described in this document applies to the following MCU:

- MCU: R32C/118 Group

This program can be used with other R32C/100 Series MCUs which have the same special function registers (SFRs) as the R32C/118 Group. Check the manual for any additions or modifications to functions. Careful evaluation is recommended before using this application note.

3. Explanation of the Application Example

The protect function protects important registers from being unintentionally rewritten due to a program runaway. After deasserting the protect, protected registers can be rewritten.

After setting the PRC2 bit in the PRCR register to 1 (write enabled), when writing to an arbitrary address, the bit becomes 0 (write disabled). Rewrite registers PLC0, PLC1, PD9, and P9_iS (i = 0 to 7) with the instruction immediately after setting the PRC2 bit to 1. Do not generate an interrupt or perform DMA transfer in between setting the PRC2 bit to 1 and the next instruction. Regardless of writing to arbitrary addresses, bits PRC0, PRC1, PRC27, and PRC31 will not become 0, and must be set to 0 by the user.

When data does not need to be written to registers protected by the PRR register, in order to protect registers from being unintentionally written to, write a value other than AAh to the PRR register.

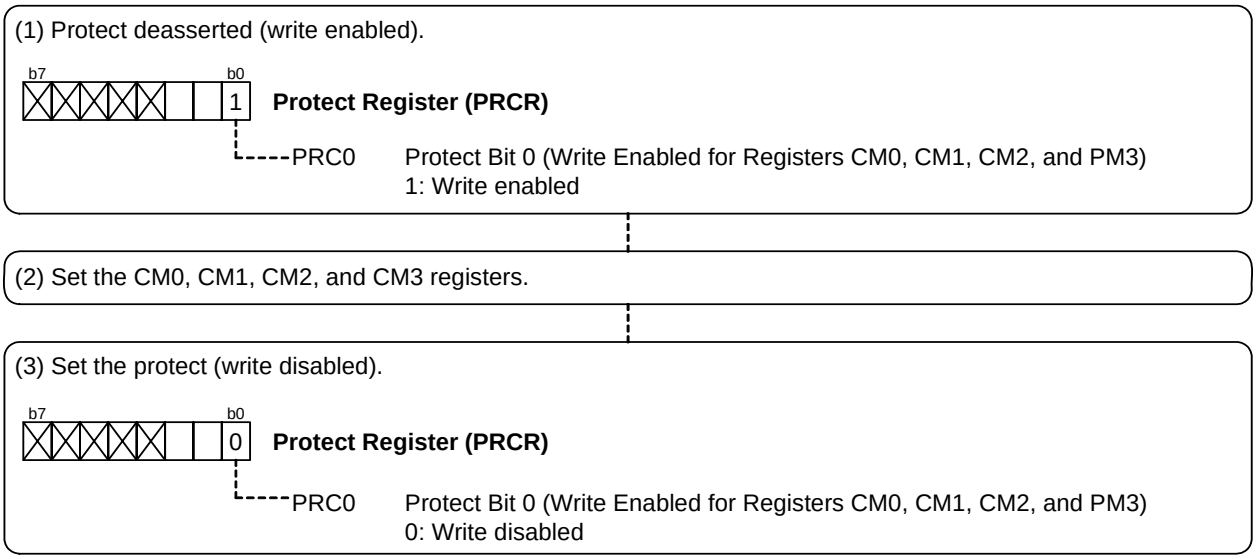
Table 3.1 The Protect Register and Protected Registers

Protect Register	Write Disable/Enable	Protected Registers
PRCR	PRC0 Bit 0: Write disabled 1: Write enabled	CM0 to CM2, and PM3
	PRC1 Bit 0: Write disabled 1: Write enabled	PM0, PM2, CSOP0 to CSOP2, INVC0, INVC1, IOBC, and I2CMR
	PRC2 Bit 0: Write disabled 1: Write enabled	PLC0, PLC1, PD9, and P9_iS (i = 0 to 7)
PRCR2	PRC27 Bit 0: Write disabled 1: Write enabled	CM3
PRCR3	PRC31 Bit 0: Write disabled 1: Write enabled	VRCR, LVDC, DVCR
PRR	b7 to b0 Not AAh: Write disabled AAh: Write enabled	CCR, FMCR, PBC, FEBC0, FEBC3, EBC0 to EBC3, CB01, CB12, and CB23

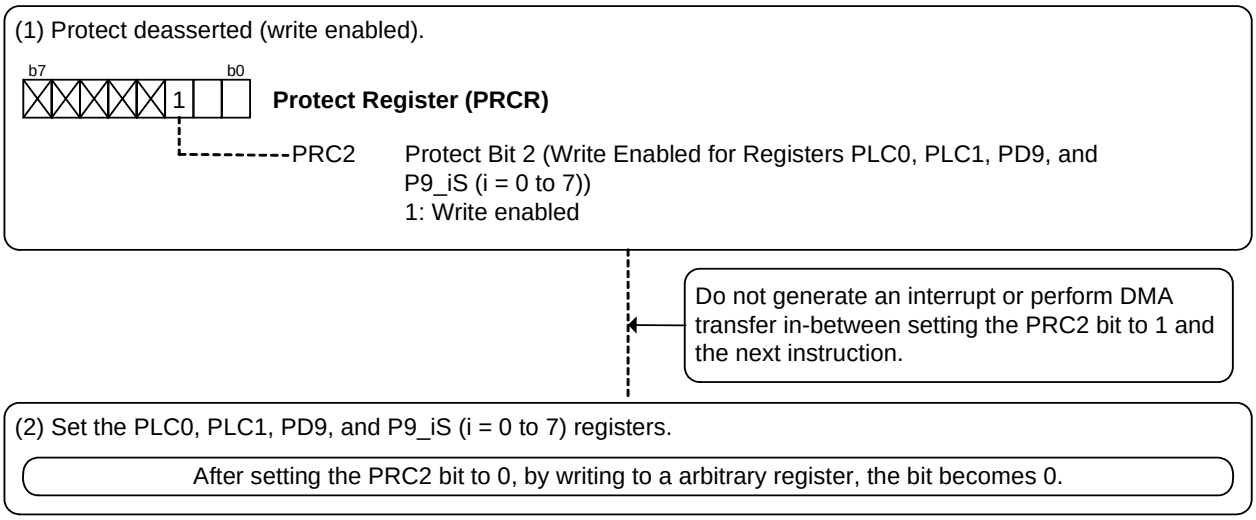
4. Setting

This section shows the procedures and values to set the example in chapter **3. "Explanation of the Application Example"**. Refer to individual MCU hardware manuals for details on individual registers.

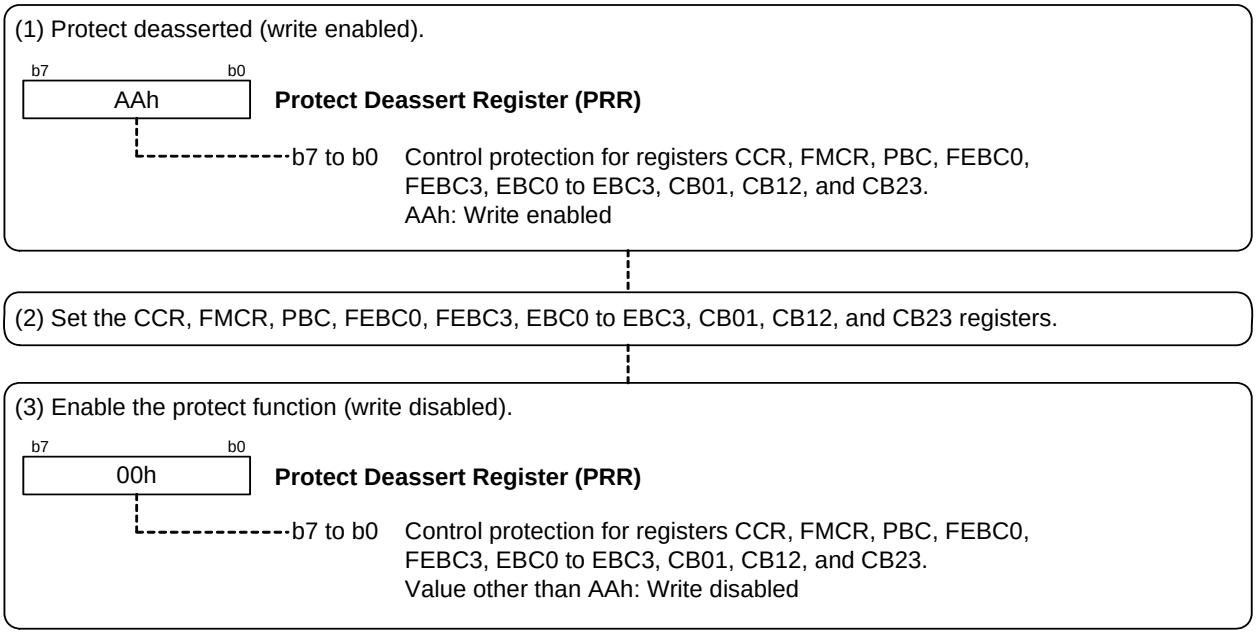
4.1 Using the PRC0 bit to change the protected registers



4.2 Using the PRC2 bit to change the protected registers



4.3 Using the PRR register to change the protected registers



5. Sample Program

A sample program can be downloaded from the Renesas Technology website.

6. Reference Documents

Hardware Manual
R32C/118 Group Hardware Manual Rev.1.00
The latest version can be downloaded from the Renesas Technology website.

Technical Update/Technical News
The latest information can be downloaded from the Renesas Technology website.

C Compiler Manual
R32C/100 Series C Compiler Package Ver. 1.02 Compiler User's Manual Rev. 1.00
The latest version can be downloaded from the Renesas Technology website.

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Renesas Technology Website
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REVISION HISTORY	Protect Operation

Rev.	Date	Description	
		Page	Summary
1.00	Mar. 5, 2010	—	Initial release

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