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Renesas Electronics Corporation

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M32C/84, 85, 86, 87, 88 Group

Timer B Operation in Event Counter Mode

1. Abstract

The timer counts an external signal (input from the TBiIN pin) or other timer overflow/underflow.

2. Introduction

The application example described in this document is applied to the following MCUs and parameter(s):

MCUs: M32C/84 Group
M32C/85 Group
M32C/86 Group
M32C/87 Group
M32C/88 Group

This program can be used with other M16C Family MCUs which have the same special function registers (SFRs) as the above MCUs. Check the manual for any additions and modifications to functions. Careful evaluation is recommended before using this application note.

3. Application Example

This section describes how to count the falling edges of the TBiIN pin and to generate an interrupt request every 1,000 counts.

3.1 Example Description

(1) Setting the TBiS bit in the TABSR register or TBSR register to 1 (count started) causes the counter to count the falling edges of the count source.
(2) If an underflow occurs, the counter reloads the content of the reload register and continues counting. At the same time, the IR bit in the TBiIC register is set to 1 (interrupt requested).
(3) Setting the TBiS bit to 0 (count stopped) causes the counter to hold its count value and to stop.

Figure 1 shows the Event Counter Mode Operation.

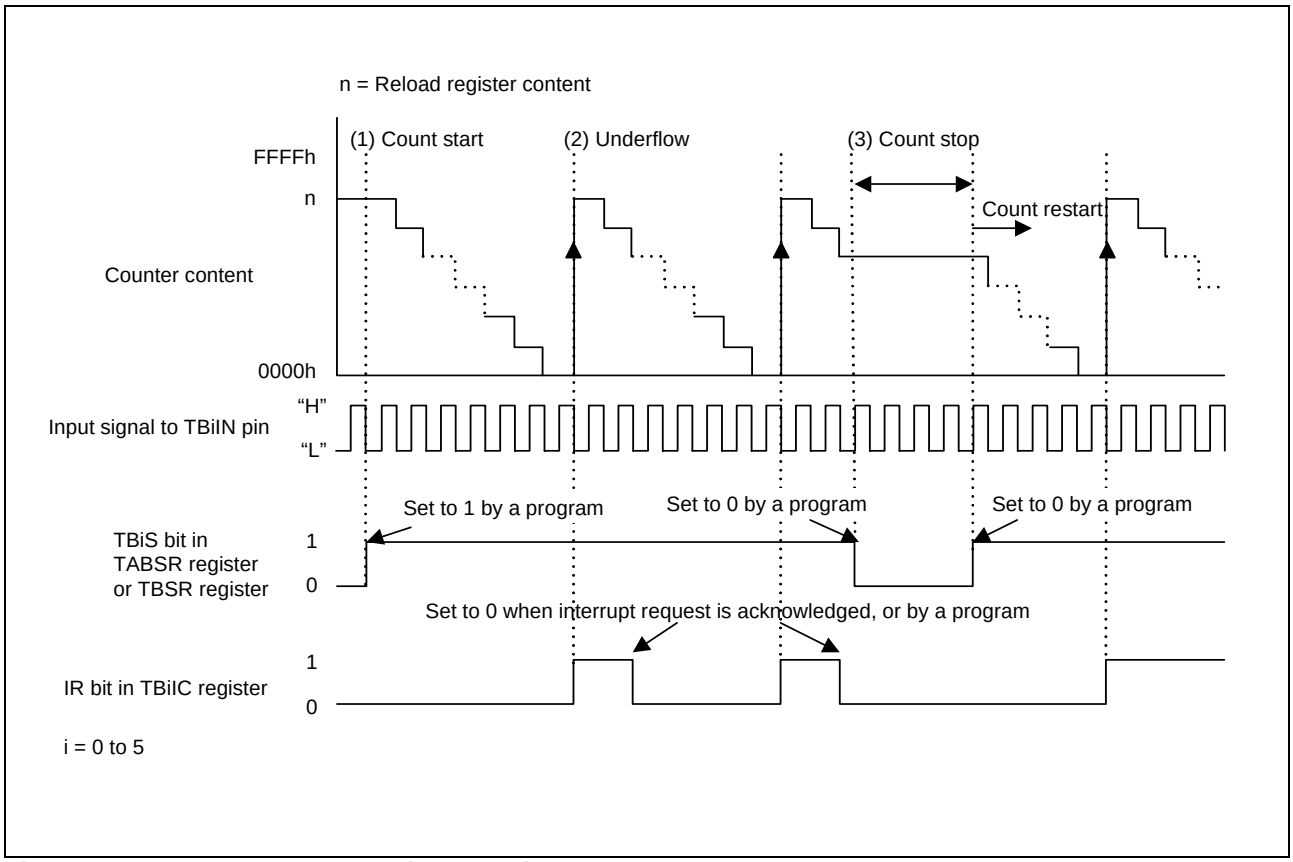


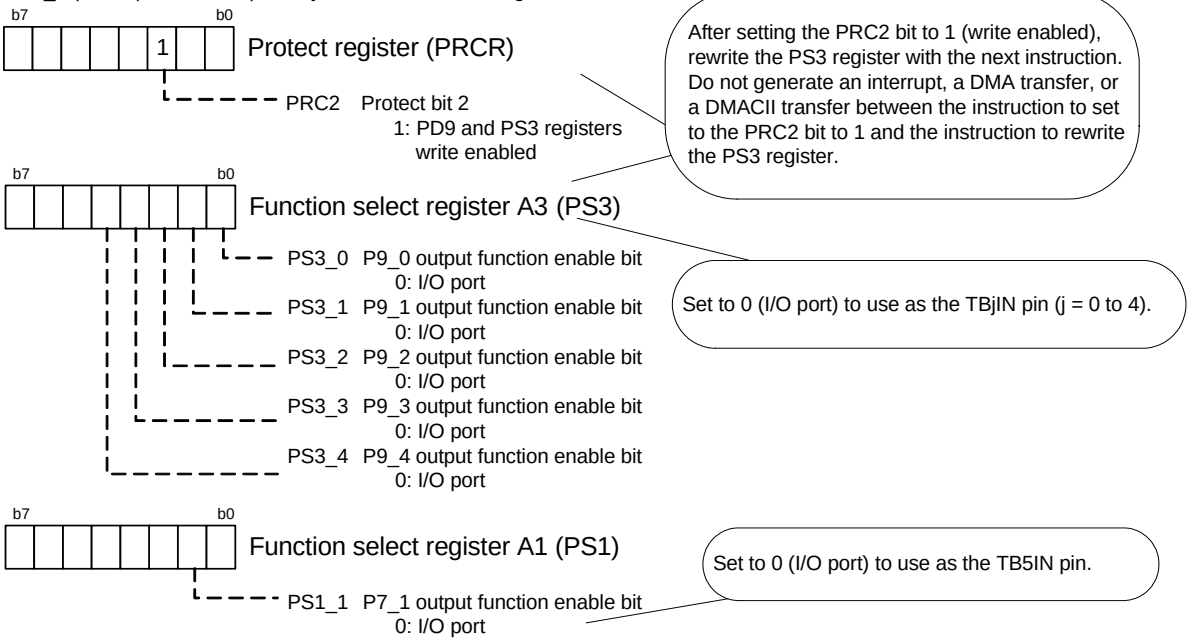
Figure 1 Event Counter Mode Operation

3.2 Setup

This section shows the setting steps and values to perform the application example described in **3.1**. **Example Description**.
Refer to the each MCUs Hardware Manual for details of individual registers.

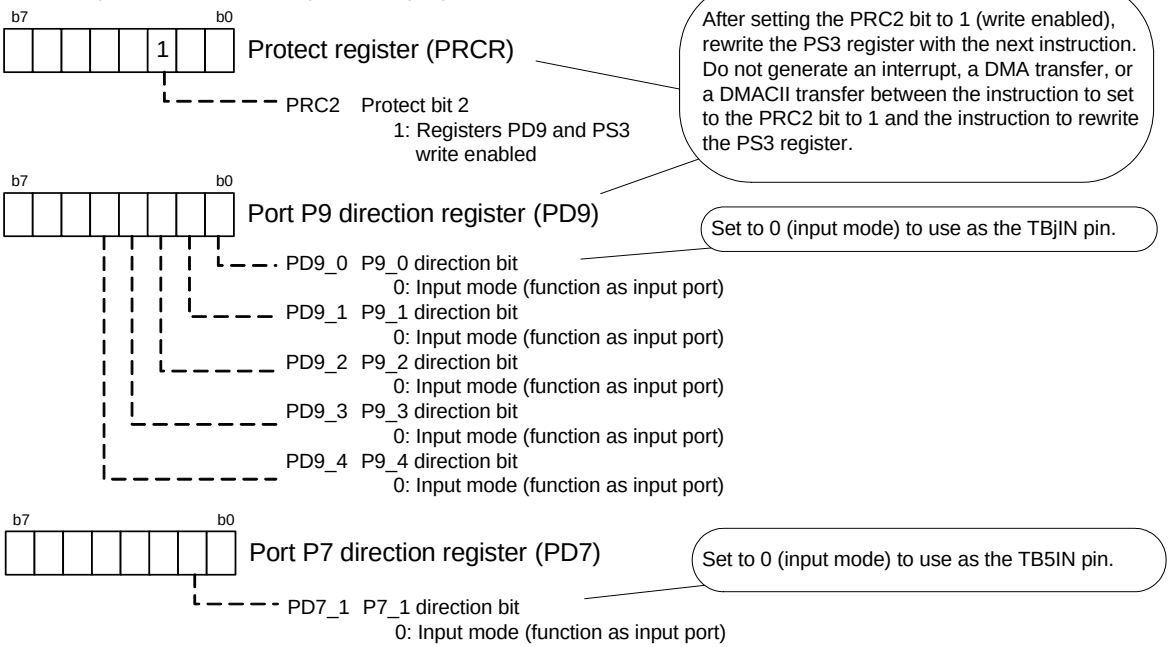
(1) Set the function select registers

The TBiIN pins (i = 0 to 5) are assigned to P9_0 (TB0IN), P9_1 (TB1IN), P9_2 (TB2IN), P9_3 (TB3_IN), P9_4 (TB4IN), and P7_1 (TB5IN). Select I/O ports by the function select registers.

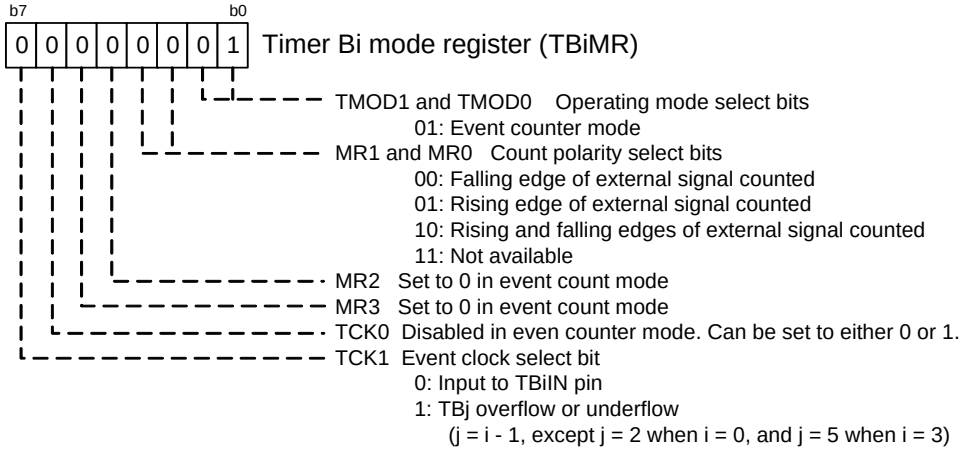


(2) Set the port P9 direction register and the port P7 direction register

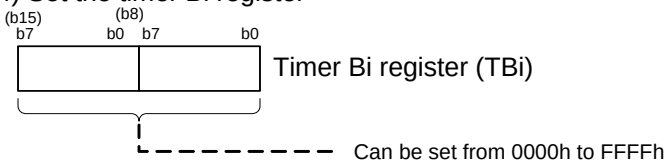
Set the pin to use as the TAiIN pin to an input port.



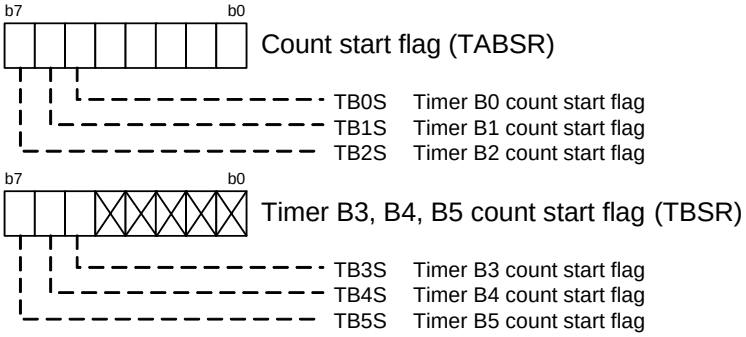
(3) Set the timer Bi mode register (i = 0 to 5)



(4) Set the timer Bi register



(5) Set the count start flags



4. Sample Programming Code

A sample program can be downloaded from the Renesas Technology website.
For download, click “Application Notes” in the left-hand side menu of the M16C Family page.

5. Reference Documents

Hardware Manuals
M32C/84 Group Hardware Manual
M32C/85 Group Hardware Manual
M32C/86 Group Hardware Manual
M32C/87 Group Hardware Manual
M32C/88 Group Hardware Manual
The latest version can be downloaded from the Renesas Technology website.

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Rev.	Date	Description	
		Page	Summary
1.00	Sep.10, 2006	–	First Edition issued

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