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April 1st, 2010
Renesas Electronics Corporation

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

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M16C/62A Group

Operation of Timer B (event counter mode)

1.0 Abstract

In event counter mode, choose functions from those listed in Table 1. Operations of the circled items are described below.

Table 1. Chosed functions

Item	Set-up
Count source	○ Input signal to the TBiIN pin (counting falling edges)
	○ Input signal to the TBiIN pin (counting rising edges)
	○ Input signal to the TBiIN pin (counting rising edges and falling edges)
	○ Timer overflow(TBj overflow)

Note: $j = i - 1$, but $j = 2$ when $i = 0$, $j = 5$ when $i = 3$

2.0 Introduction

- Operation
- (1) Setting the count start flag to "1" causes the counter to count the falling edges of the count source.
 - (2) If an underflow occurs, the content of the reload register is reloaded, and the count continues. At this time, the timer Bi interrupt request bit goes to "1".
 - (3) Setting the count start flag to "0" causes the counter to hold its value and to stop.

Figure 1 shows the operation timing

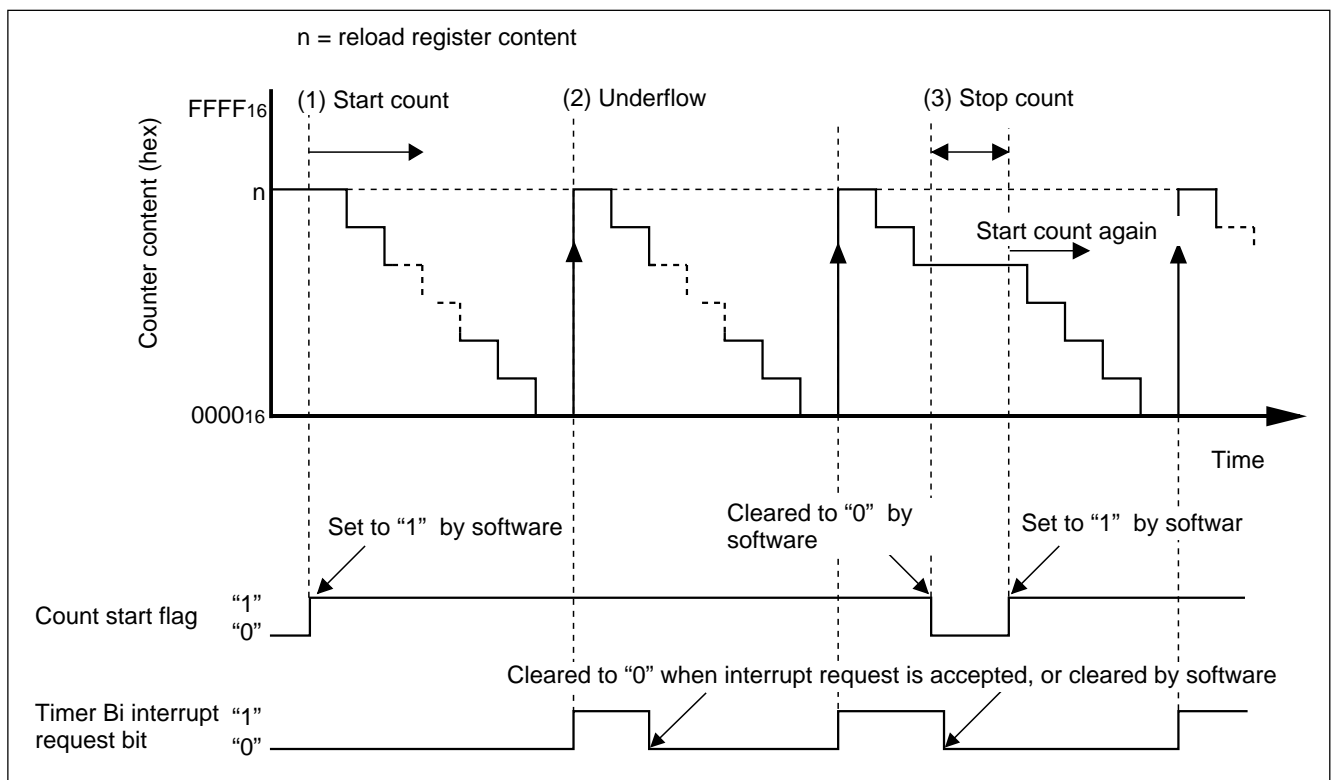
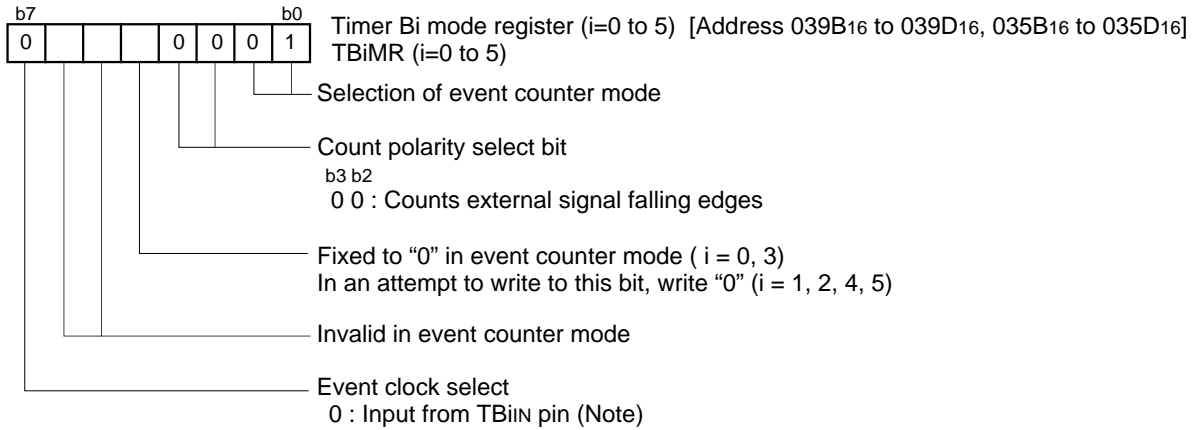


Figure 1. Operation timing of event counter mode

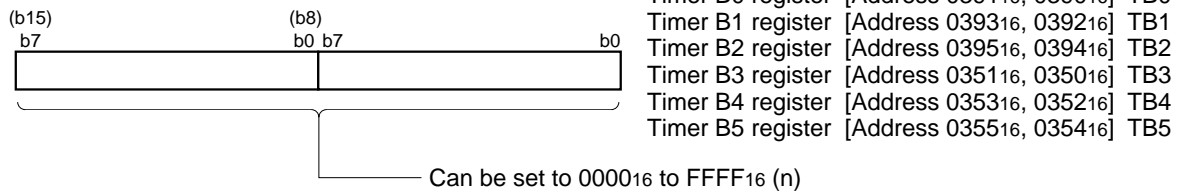
3.0 Set-up procedure

Selecting event counter mode and functions

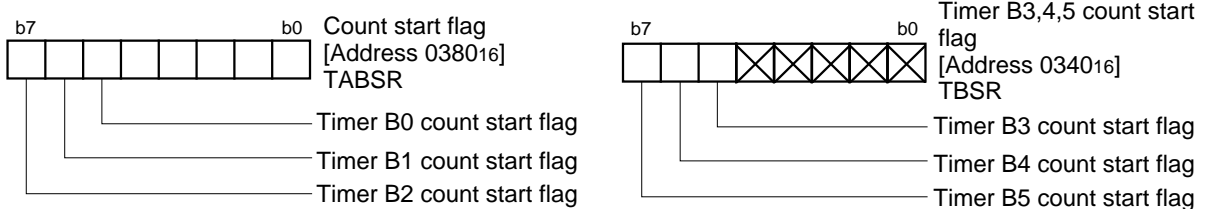


Note: Set the corresponding port direction register to "0".

Setting counter value



Setting count start flag



Start count


```

=====
;
;   TimerB (event counter mode)
;=====
MOV.B   #00000001B, tb0mr ;Selecting event counter mode and functions
;
;       |||||++-----;Selection of event counter mode
;       |||++-----;Counts external signal falling edges
;       ||+-----;Fixed to "0" in event counter mode
;       |+-----;Invalid in event counter mode
;       +-----;Event clock select (0:Input from TB0IN pin) (Note)
MOV.B   #00000100B, prcr  ;Clearing the protect (set to write-enabled state)
;
;       +-----;Enables writing to port P9 direction register
BCLR   pd9_0           ;(Note) Set the corresponding port direction register to 0
MOV.W   #C_CNT_TB_EV, tb0 ;Setting counter value
MOV.B   #00100000B, tabsr ;Setting count start flag
;
;       +-----;TimerB0 count start flag
;
MAIN:
JMP     MAIN
;
;=====
;   Dummy interrupt processing program
;=====
dummy:
REIT
;
;*****
;   Setting of fixed vector
;*****
.SECTION   F_VECT, ROMDATA
.ORG      FIXED_VECT_TOP
;
.LWORD    dummy ;Undefined instruction interrupt vector
.LWORD    dummy ;Overflow (INT0 instruction) interrupt vector
.LWORD    dummy ;BRK instruction interrupt vector
.LWORD    dummy ;Address match interrupt vector
.LWORD    dummy ;Single-step interrupt vector
.LWORD    dummy ;Watchdog timer interrupt vector
.LWORD    dummy ;DBC interrupt vector
.LWORD    dummy ;NMI interrupt vector
.LWORD    RESET ;Sets reset vector
;
.END

```

5.0 Reference

Renesas Technology Corporation Semiconductor Home page
<http://www.renesas.com/>

Technical Support

E-mail: support_apl@renesas.com

Data Sheet

M16C/62A group Rev. C.1
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User's Manual

M16C/62A group Rev. 1.0
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