

AT8 系列動態更新 Timer Data & PWM Duty 應用注意事項

內容： AT8 系列動態更新 Timer Data & PWM Duty 操作說明。

原因： 動態更新 PWM 頻率，應在 Timer 發生溢位時進行 Timer Data & PWM Duty 更新，確保 PWM 輸出符合預期。

方法： AT8 系列動態更新 Timer Data & PWM Duty 說明步驟如下。

1. 設定 Timer Data & PWM Duty 初值。需注意 PWM Duty 不可大於 Timer Data。
2. 打開 Timer 中斷。
3. 在中斷服務迴圈更新 Timer Data & PWM Duty。多個中斷應用時，需優先確認該 Timer 的溢位旗標。

範例一: ASM 範例程式

```

V_MAIN:
    movia    0x00
    iost     IOSTB                      ; Set PortB as output
    disi                                ; Disable all interrupts

    movia    0x00
    movar    TMRH
    movia    0xFF
    sfun     TMR1                      ; Load 0xFF to TMR1 (Timer1[9:0]=0x0FF)
    movia    0x80
    sfun     PWM1DUTY                  ; Load 0x80 to PWM1DUTY LB register ( PWM1DUTY[9:0]=0x080 )

    movia    C_PWM1_En | C_TMR1_Reload | C_TMR1_En
    sfun     T1CR1                    ; Enable Timer1, Initial value reloaded from TMR1, Non-stop mode
    movia    C_TMR1_ClkSrc_Inst
    sfun     T1CR2                    ; Timer1 clock source = instruction clock

    movia    C_INT_TMR1
    movar    INTE
    eni                                ; Enable Timer1 overflow interrupt
    ; Enable all unmasked interrupts

;-----
L_MAIN_LOOP:
    clrwdt
    fgoto    L_MAIN_LOOP
;-----
V_INT:
    movar    R_AccBuf
    swapr    R_AccBuf,C_SaveToReg      ; Store ACC value
    movr     STATUS,C_SaveToAcc
    movar    R_StatusBuf
    ; Store STATUS value

;-----
L_TIME1_INT:
    btrss    INTF,C_INT_TMR1_Bit      ; Skip next instruction, if T1IF=1
    lgoto    L_RET2Main

    movia    0x01
    xorar    PORTB,1                  ; PB0 Toggle
    movia    ~C_INT_TMR1
    movar    INTF                    ; Clear T1IF (Timer1 overflow interrupt flag bit)

    movia    0x00
    movar    TMRH
    movia    0x80
    sfun     TMR1                      ; Load 0x80 to TMR1 (Timer1[9:0]=0x0FF)
    movia    0x40
    sfun     PWM1DUTY                  ; Load 0x40 to PWM1DUTY LB register ( PWM1DUTY[9:0]=0x080 )

L_RET2Main:
    movr     R_StatusBuf,C_SaveToAcc
    movar    STATUS
    swapr    R_AccBuf,C_SaveToAcc      ; Restore STATUS value
    ; Restore ACC value
    retie                                ; Return from interrupt and enable interrupt globally

```

範例二: C 範例程式

```

void main(void)
{
    IOSTB = 0; // Set PortB as output

    DISI(); // Disable all interrupts

    TMRH = 0; // Load 0xFF to TMR1 (Timer1[9:0]=0x0FF)
    TMR1 = 0xFF; // Load 0x80 to PWM1DUTY LB register ( PWM1DUTY[9:0]=0x080 )
    PWM1DUTY = 0x80;

    T1CR1 = C_PWM1_En | C_TMR1_Reload | C_TMR1_En; // Enable Timer1, initial value reloaded from TMR1, Non-stop mode
    T1CR2 = C_TMR1_ClkSrc_Inst; // Timer1 clock source = instruction clock

    INTE = C_INT_TMR1; // Enable Timer1 overflow interrupt
    ENI(); // Enable all unmasked interrupts

    while(1)
    {
        CLRWDI();
    }

    //interrupt service routine
    void isr(void) __interrupt(0)
    {
        if(INTFbits.T1IF)
        {
            PORTB ^= 1; // P80 Toggle
            INTF= (unsigned char)~(C_INT_TMR1); // Clear T1IF flag bit

            TMRH = 0; // Update 0x80 to TMR1 (Timer1[9:0]=0x080)
            TMR1 = 0x80; // Update 0x40 to PWM1DUTY LB register ( PWM1DUTY[9:0]=0x040 )
            PWM1DUTY = 0x40;
        }
    }
}

```

適用 IC Body 如下：

1. AT8A 系列：AT8A513F / AT8A513G / AT8A513H / AT8A52E / AT8A53E / AT8A54A / AT8A54E / AT8AE513F
2. AT8B 系列：AT8B60D / AT8B62A / AT8B62F / AT8BM62D / AT8BE62D / AT8BE64A
3. AT8T 系列：AT8TM52D / AT8TE64A