

Description

The 8-bit timer/event counter 1 (TM1) in the μ PD7805x/ μ PD78005x subseries can be used as an interval timer, external event counter, or square-wave output.

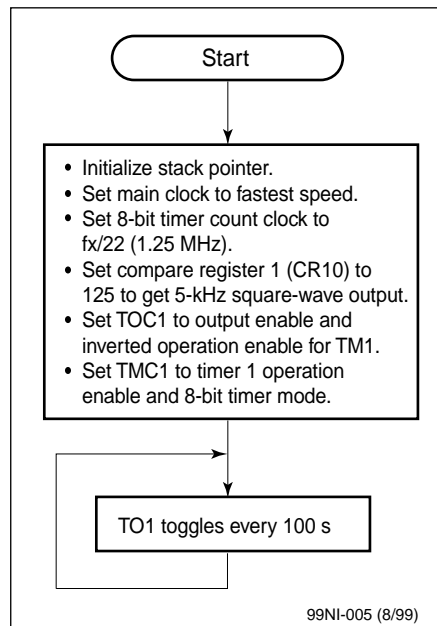
This program demonstrates how the 8-bit timer/event counter operates in square-wave output mode. When the count value of the 8-bit timer register (TM1) matches the value set to the 8-bit compare register (CR10), the timer output control (TO1/P31) toggles, an interrupt request signal (INTTM1) is generated (but not needed in this example program), and counting continues with the 8-bit timer register (TM1) cleared to 0.

This program uses the timer output (TO1/P31) and does not use the interrupt request.

Program Specifications

- Count clock frequency: 1.25 MHz at 5 MHz main system clock
- Square wave frequency: 5 kHz (200 μ s period)
- Pins used in program: TO1/P31
- 5-kHz square-wave signal

Flowchart



Assembly Language Program

```

;*****
; Date:      06/02/1999
;
; Parameters: - fastest CPU clock
;              (fx = 5.00MHz, 1 CPU clock cycle = 200 ns)
;              - count clock: fx(1.25 MHz)
;              - square wave frequency: 5 kHz(200 µs period)
;              - output port: T01 (P31)
;*****

;=====
;Specify Interrupt Vectors      =
;=====

RES_VEC      CSEG   AT 0000h      ; Set main program start vector
DWStart

;=====
;Main Program                  =
;=====

MAIN         CSEG
Start:      DI                ; Disable interrupts
            MOVW   AX, #0FE20h  ; Load SP address
            MOVW   SP, AX      ; Set Stack Pointer
            MOV    OSMS,#01h    ; Don't use scaler
            MOV    PCC, #00h    ; Main system clock at fastest setting
            CLR1  P3.1         ; Set port 3.1 latch (P31/T01) output low
            CLR1  PM3.1        ; Set port 3.1 to output mode
            MOV    TCL1,#07h    ; Select counter clock to fx(1.25 MHz)
            MOV    CR10,#125    ; Set Compare register to 125 for
                                ; 5 kHz (200 µs) square-wave output
            MOV    TOC1,#03h    ; TM1 output enable and inverted operation on TM1 enable
            MOV    TMC1,#01h    ; Set TM1 operational enable and 8-bit timer mode
Loop1:      BR     $Loop1      ; Endless loop
            END

```

C Language Program

```

/*****
; Date:          06/02/1999
;
; Parameters: - fastest CPU clock
;              (fx=5.00MHz, 1 CPU clock cycle = 200 ns)
;              - count clock: fx(1.25 MHz)
;              - square wave frequency: 5 kHz(200 µs period)
;              - output port: T01 (P31)
;*****/
/* extension functions in K0/K0S compiler */
#pragma sfr          /* key word to allow SFR names in C code */

/*=====
;      Constants/Variables          =
;=====*/

#define TRUE          1
#define FALSE         0
/*=====
;      Main Program                  =
;=====*/
void main(void)
{
    OSMS = 0x01;          /* Don't use scaler */
    PCC = 0x00;          /* Main system clock at fastest setting */
    P3.1 = 0;           /* Set port 3.1 latch (P31/T01) output low */
    PM3.1 = 0;          /* Set port 3.1 to output mode */
    TCL1 = 0x07;        /* Select counter clock to fx(1.25 MHz) */
    CR10 = 125;         /* Set Compare register to 125 for
                        5 kHz (200 µs) square-wave output */
    TOC1 = 0x03;        /* TM1 output enable and inverted operation on TM1 enable */
    TMC1 = 0x01;        /* Set TM1 operational enable and 8-bit timer mode */
    while(TRUE);       /* Endless loop */
}

```



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