

Description

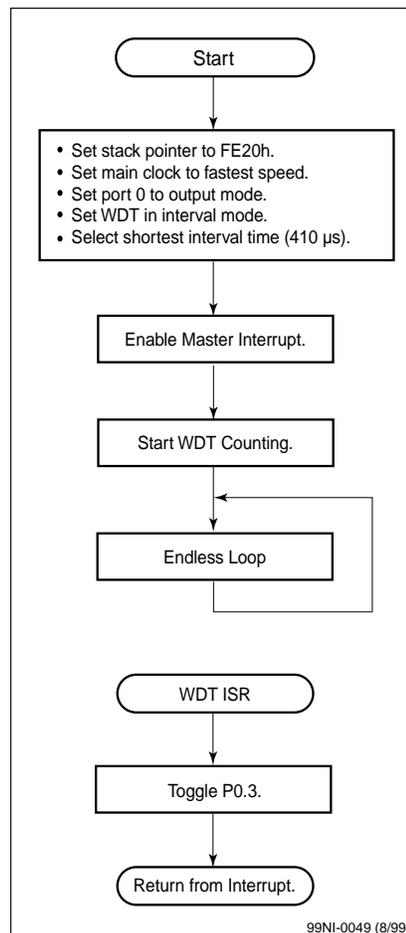
The watchdog timer (WDT) in the μ PD7805x/78005x subseries can be used in watchdog timer mode or interval timer mode.

This program demonstrates interval timer mode, where the WDT functions as a standard 8-bit timer that generates interrupt requests repeatedly at intervals set to the timer clock select register (TCL2). In the interrupt service routine (ISR), the program continuously toggles port 0 bit 3.

Program Specifications

- ❑ Watch dog timer count: $f_{xx}/2^3 = 625$ kHz at 5-MHz main system clock
- ❑ Interval time: $t = 410$ μ s
- ❑ Toggle frequency: $f = 1220$ Hz
- ❑ Pins used in program: P03/INTP3 (toggles every 410 μ s)

Flowchart



Assembly Language Program

```

;*****
; Date:          07/14/1999
;
; Parameters:   - fastest CPU clock
;                (fx = 5.00 MHz; 1 CPU clock cycle = 200 ns)
;                - interval time is 2^11/fx (410 µs)
;                - use WDT in Interval timer mode
;                - port 0.3 toggles every 410 µs
;
;*****

;=====
;=      Specify Interrupt Vectors      =
;=====
Res_Vec      CSEG AT 0000h      ; Set main program start vector
             DW      Start

WDT_Vec      ORG    0004h      ; Set interrupt vector for WDT
             DW      WDT_ISR

;=====
;=      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

            MOV    P0,   #00h     ; Clear port 0 latch
            MOV    PM0,  #00h     ; P0.0 to P0.3 are outputs
            MOV    TCL2, #00h     ; WDT clock will be 2^11/fx (410 µs)
            MOV    WDTM, #00h     ; Set WDT into Interval timer mode
            CLR1   TMMK4         ; Unmask the WDT interrupt mask bit
            SET1   RUN          ; Start WDT operation
            EI                  ; Enable interrupts

Loop1:     BR     $Loop1         ; Endless loop

;=====
;=      Interrupt Routine                =
;=====
ISR        CSEG
WDT_ISR:   XOR    P0,#08h       ; Toggle port 0.3
            RETI                ; Return from interrupt

            END

```

C Language Program

```

/*****
; Date:      07/14/1999
;
; Parameters: - fastest CPU clock
;              (fx = 5.00 MHz; 1 CPU clock cycle = 200 ns)
;              - interval time is 2^11/fx (410 µs)
;              - use WDT in Interval timer mode
;              - port 0.3 toggles every 410 µs
;
*****/
/* extension functions in K0/K0S compiler */

#pragma sfr /* key word to allow SFR names in C code */
#pragma DI /* key word for DI instruction in C code */
#pragma EI /* key word for EI instruction in C code */

/*;=====
; Specify Interrupt Vectors =
;=====*/
/* Set interrupt vector for the Watchdog timer */

#pragma interrupt INTWDT WDT_ISR
/*;=====
;= Constants/Variables =
;=====*/
#define TRUE 1
#define FALSE 0

/*;=====
;= Main Program =
;=====*/
void main(void)
{
    DI(); /* Disable interrupts */

    OSMS = 0x01; /* Don't use scaler */
    PCC = 0x00; /* Main system clock at fastest setting */
    P0 = 0x00; /* Latch port 0 low */
    PM0 = 0x00; /* Set P0.0 - P0.3 to outputs */
    TCL2 = 0x00; /* interval timer = 2^11/fx (410 µs) */
    WDTM = 0x00; /* Set WDT into interval timer mode */
    TMMK4 = 0; /* Unmask the WDT interrupt mask bit */
    RUN = 1; /* Start WDT running */
    EI(); /* Enable interrupts */
    while(TRUE)
    {
        /* endless loop */
    }
    /* end of function main() */
/*;=====
; Interrupt Routine =
;=====*/
void WDT_ISR(void)
{
    P0 ^= 0x08; /* toggle port 0.3 */
}
/* end of WDT_ISR */

```



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