

### On-Chip Peripheral Program Example

August 1999

#### Description

The serial channel 0 of the  $\mu$ PD7805x/78005x subseries can be used in 2-wire serial I/O mode, 3-wire serial I/O mode, serial bus interface mode.

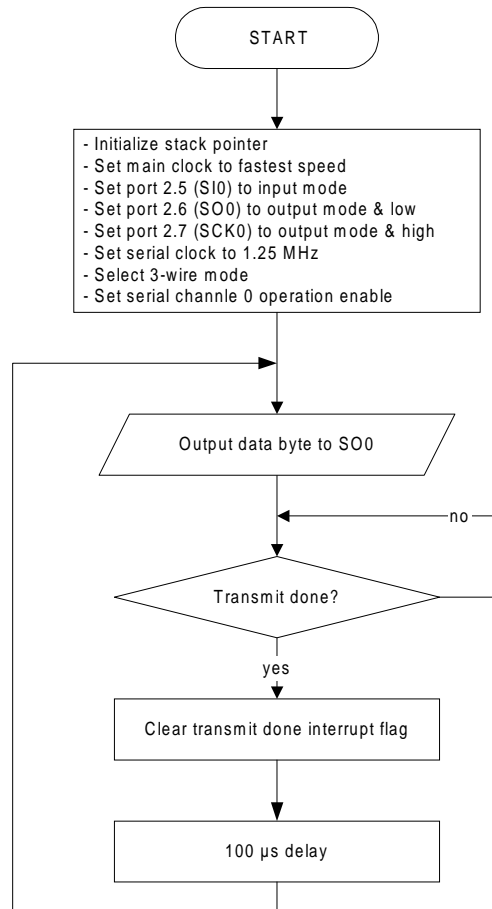
This program demonstrates the 3-wire serial interface in transfer-only mode. The data byte 55h is output to pin SO0/SB1/P26 followed by a 100  $\mu$ s delay.

Caution: When using the program on an NEC emulator, connect pull-up resistors (1 k $\Omega$  typ.) to the SO0 data and SCK0 clock signals.

#### Program Specifications

- Serial clock selection: fx/4 (1.25 MHz)
- Output data format: 8-bit
- Data pattern: 55h followed by a 100  $\mu$ s delay continuously
- Pins used in program:
  - Data output: SO0/SB1/P26
  - Serial clock output: SCK0/P27

#### Flowchart



## Assembly Language Program

```

;*****
; Date:          08/13/1999
;
; Parameters: - fastest CPU clock
;              (fx = 5 MHz; 1 CPU clock cycle = 200 ns)
;              - Serial clock speed:      fx/4 (1.25 MHz)
;              - Data format:            8-bit, MSB first
;              - Data byte:              01010101b (55h)
;              - Data output:           S00/P26/SB0
;              - Serial clock output:    SCK0/P27
;*****
;=====
;=          Constants/Variables          =
;=====
RXDirPort   equ     PM2.5      ;RX direction port
TXDirPort   equ     PM2.6      ;TX direction port
TXDataPort  equ     P2.6       ;TX Data port
SCKDirPort  equ     PM2.7      ;SCK direction port
SCKDataPort equ     P2.7       ;SCK data port
;=====
;=          Specify Interrupt vectors    =
;=====
Res_Vec CSEG AT 0000h          ; Set main program start vector
        DW          Start
;=====
;=          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
        SET1       RXDirPort    ; Set RX port to input direction
        CLR1       TXDirPort    ; Set TX port to output direction
        CLR1       TXDataPort   ; Clear TX port
        CLR1       SCKDirPort   ; Set SCK0 to output direction
        SET1       SCKDataPort  ; Set SCK0
        MOV        CSIM0,#83h   ; Operation settings:
                                ; - Use clock specified in TCL3 register
                                ; - Setup for 3-wire mode
                                ; - Operation enable
        MOV        TCL3,#07h    ; Serial clock speed = 1.25 MHz
        CLR1       CSIIF0       ; Clear transfer done interrupt flag
        EI                    ; Enable interrupt
Loop_1:  MOV        A,#55h      ; Load data byte
        MOV        SIO0,A      ; Output the data byte
Wait:    NOP
        BF         CSIIF0, $Wait ; Wait till transmit of data byte finished
        CLR1       CSIIF0       ; Clear transmit done interrupt flag
        MOV        B,#55       ; Load delay loop value (100 μs)
Loop_2:  NOP
        DBNZ      B,$Loop_2    ; If B not zero, decrement and branch back
        BR         Loop_1      ; Repeat transmission
        END

```

### C Language Program

```

/*****
; Date:          08/13/1999
;
; Parameters: - fastest CPU clock
;              (fx = 5 MHz; 1 CPU clock cycle = 200 ns)
;              - Serial clock speed:      fx/4 (1.25 MHz)
;              - Data format:             8-bit, MSB first
;              - Data byte:               01010101b (55h)
;              - Data output:             S00/P26/SB0
;              - Serial clock output:     SCK0/P27
;*****/
/* extension functions in K0/K0S compiler */
#pragma sfr          /* key word to allow SFR names in C code */
#pragma asm         /* key word to allow ASM statements in C code */
#pragma NOP        /* key word for NOP instruction in C code */
#pragma DI         /* key word for DI instruction in C code */
#pragma EI         /* key word for EI instruction in C code */
/*=====
;          Constants/Variables          =
;=====*/
#define TRUE      1
#define FALSE     0
#define RXDirPort    PM2.5    // RX direction port
#define TXDirPort    PM2.6    // TX direction port
#define TXDataPort   P2.6     // TX Data port
#define SCKDirPort   PM2.7    // SCK direction port
#define SCKDataPort  P2.7     // SCK data port
unsigned char i;
/*=====
;          Main Program                =
;=====*/
void main(void)
{
    OSMS = 0x01;          /* Don't use scaler */
    PCC = 0x00;          /* Main system clock at fastest setting */
    RXDirPort = 1;      /* Set RX port to input direction */
    TXDirPort = 0;      /* Set TX port to output direction */
    TXDataPort = 0;     /* Clear TX port */
    SCKDirPort = 0;     /* Set SCK0 to output direction */
    SCKDataPort = 1;    /* Set SCK0 */
    CSIM0 = 0x83;       /* Operation settings:
                        - Use clock specified in TCL3 register
                        - Setup for 3-wire mode
                        - Operation enable */

    TCL3 = 0x07;        /* Serial clock speed = 1.25 MHz */
    CSIIIF0 = 0;        /* Clear transfer done interrupt flag */
    EI();               /* Enable interrupt */
    while(TRUE)        /* Transmit data loop */
    {
        SIO0 = 0x55;    /* Transmit the character */
        while(!CSIIIF0); /* Wait for transmission is done */
        CSIIIF0 = 0;    /* Clear receive interrupt flag */
        for(i = 0; i < 12 ; i++); /* Delay 100 µs */
    }
    /* End of WHILE loop */
}
/* End of MAIN() */

```



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