



4-Bit Micro-Controller

TM87 series

SZ044_01

The day in the week automatic adjustment

Application Note

**Tenx reserves the right to change or
discontinue this product without notice.**

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PRODUCT NAME**SZ044_01****TITLE**

The day in the week automatic adjustment

APPLICATION NOTE

The purpose of the function : to calculate the day in the week between 2000 to 2099.

Operating procedure: enter year, month, and date.

Calculation method : First, obtain the day of the week for January 1 for the year from a look up table,
then obtain the difference between the first of the month and January 1 for the month from a look up table and calculate the day of the week for the first of the month entered.
Finally, calculate the day of the week of the day entered.

Example :

December 28, 2045

Input : yearh=4
 yearl=5
 month=0cH
 dayh=2
 dayl=8

Output : worktmp+2(week)
 worktmp+2=00 Sunday
 worktmp+2=01 Monday
 worktmp+2=02 Tuesday
 worktmp+2=03 wednesday
 worktmp+2=04 Thursday
 worktmp+2=05 friday
 worktmp+2=06 Saturday

Variable description :

org 00
yearh (bcd)
yearl (bcd)
month (bin)
dayh (bcd)
dayl (bcd)
org 70h

(The calculation shares the same buffer area with the display.)

worktmp (yearl)
worktmp+1(yearh)
worktmp+2(week)
worktmp

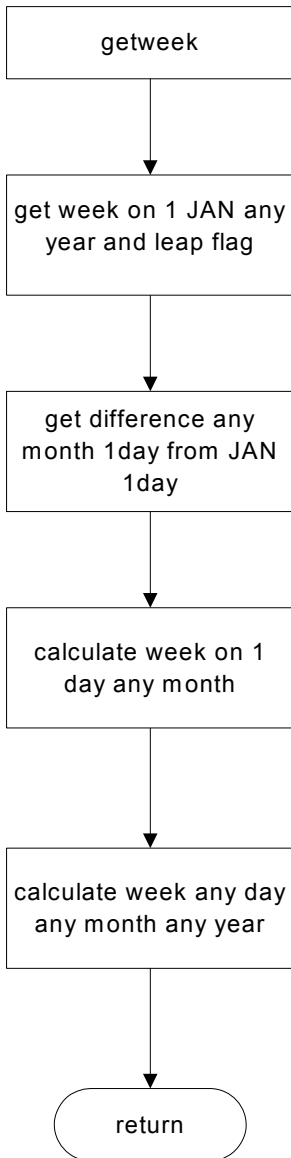
table description :

table1 : bit0~2 shows the day of the week for the January 1 of each year, bit3 indicates leap year or not, high nibble is the same as the low nibble; the high nibble of address 26~29 is used to adjust dayh.

table2 : High nibble contains the difference in the day of the week between the first of any month and January 1; low nibble is not used.

input : yearl , yearh , month , dayh , dayl

output : worktmp+2(week)



```

    org 00
yearl      dn 1
yearh      dn 1
month      dn 1
dayl       dn 1
dayh       dn 1
    org 70h
worktmp     dn 4  ;( The calculation shares the same buffer area with the display.)
;worktmp(year low) worktmp+1(year high)
;worktmp+2(week)
;*****
;
;name:      getweek
;input:     yearh yearl(bcd)
;month(hex) dayh dayl(bcd)
;output:    worktmp+2(week)
;*****
;

```

getweek:

```

    call getfirstday
    andi worktmp,0111b
    sta worktmp+2
    lds worktmp+1,monthtabadr
    lds worktmp+3,0
    mvh worktmp+1
    mrw worktmp+1,month
    mvl worktmp+1
    ldh worktmp+3,@hl
    add* worktmp+2
    call nomoreweek
    subi worktmp+1,3h
    jnc noleapyear      ;month<3
    andi worktmp,1000b
    jz noleapyear      ;no leap year
    inc* worktmp+2      ;is leap year

```

noleapyear:

```

    lds worktmp+1,2h
    lds worktmp+3,0
    mvh worktmp+1
    mrw worktmp+3,dayh ;
    addi* worktmp+3,6
    mvl worktmp+3
    ldh worktmp+3,@hl
    add* worktmp+2
    call nomoreweek
    mrw worktmp+3,dayl
    add* worktmp+2
    call nomoreweek
    dec* worktmp+2
    jc getweekret
    lds worktmp+2,06h

```

getweekret:

rts

.*****

```

;
;name:fetfirstday
;input:yearh, yearl
;output:leap status(worktmp.3)
;worktmp(1 month 1 day :week(0~2))

```

.*****

getfirstday:

```

    mrw worktmp,yearl
    mrw worktmp+1,yearh
    addi worktmp,0ah
    adci worktmp+1,0ah
    jnc nomorethan56
    subi* worktmp,06h

```

```

das* worktmp
sbc* worktmp+1,05h
nomorethan56:
mvl worktmp
subi worktmp+1,03h
jnc loadyearhllow
subi* worktmp+1,03h
lds worktmp,0
mvh worktmp+1
ldh worktmp,@hl
rts
loadyearhllow:
lds worktmp,0
mvh worktmp+1
ldl worktmp,@hl
rts
.*****
;
;name: nomoreweek
;input: worktmpt2(week)
;output:worktmp(week)<=7)
.*****
;
nomoreweek:
subi* worktmp+2,07h
jc nomoreweek
adni* worktmp+2,07h
rts
;table1*****leap flag and every year 1 month 1 day is week table
data 000H,00101110B ;Leap Year flag and The week of every year's first day
Table
data 001H,00110001B ;
data 002H,11000010B ;2000-->2055
data 003H,01100011B
data 004H,00001100B
data 005H,00010110B
data 006H,10100000B
data 007H,01000001B
data 008H,01011010B
data 009H,01100100B
data 010H,10000101B
data 011H,00100110B
data 012H,00111000B
data 013H,01000010B
data 014H,11010011B
data 015H,00000100B
data 016H,00011101B
data 017H,00100000B
data 018H,10110001B
data 019H,01010010B

```

data 020H,01101011B
data 021H,00000101B
data 022H,10010110B
data 023H,00110000B
data 024H,01001001B
data 025H,01010011B

data 026H,00000100B ;The high nibble of these four bytes
data 027H,00110101B ;are be used in week adjust process.
data 028H,01101110B ;for every 10 days the week should
data 029H,00100001B ;increase data

;table2*****no used :max day of any month data(low nibble) and any month 1 day
week(high nibble)

data 0E1H,03H
data 0E2H,30H
data 0E3H,33H
data 0E4H,62H
data 0E5H,13H
data 0E6H,42H
data 0E7H,63H
data 0E8H,23H
data 0E9H,52H
data 0EAH,03H
data 0EBH,32H
data 0ECH,53H