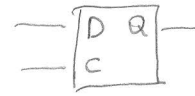


PIC 24 series of mcus → 16 bit architecture

What is the meaning of "16 bit"?

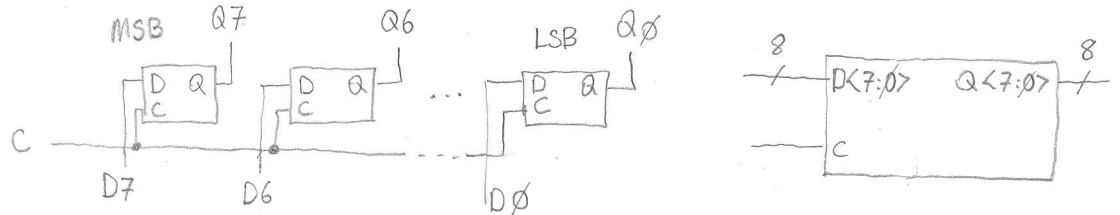
Basic storage component → A flip-flop



1-bit storage
D-FF

A collection of bits (or FFs) → A REGISTER (Bits are written simultaneously)

Ex. 8-bit register
BYTE



* The internal REGISTERS of the PIC24 family are 16 bits wide, hence a 16 bit MCU.

In other words, the WORD size of the PIC24 is 16. (A-WORD contains 16 bits)

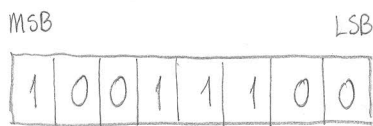
Or, a WORD for the PIC24 contains 2 BYTES.

Interpreting the content of a REGISTER:

By design, a FF contains 1 bit of information, which might assume the value 0 or 1.

Hence, a byte-sized REG might contain $2^8 = 256$ different values.

No matter how interpreted, the content is always a combination of 8 bits.



Binary 0b10011100

Hexadecimal 0x9A

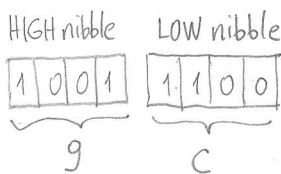
Unsigned decimal 156

Signed decimal -100

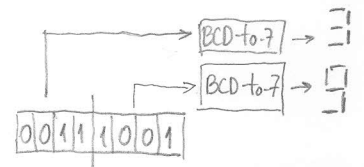
$$\begin{array}{r} \text{2's complement} \quad 0110\ 0011 \\ + \quad 1 \\ \hline 0110\ 0100 \\ 64 + 32 + 4 = 100 \end{array}$$

(100 = 256 - 156)

HEX ↔ BIN conversion very simple ← 4 bits = 1 HEX digit



Practical displays

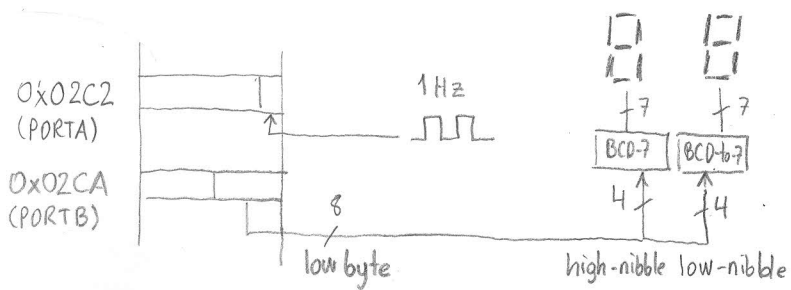


This property is sometimes used in packed BCD representations.

REG = 0x39 is "interpreted" as decimal 39. (packed BCD ranges from 0x00 to 0x99)

PROBLEM: $0x39 + 1 = 0x3A$ (invalid BCD)

but corrected by performing $0x3A + 0x06 = 0x40$



Start:

```

btss PORTA, #0
bra Start
inc W0, W0      (W0 ← W0+1)
daw.b W0
mov.b W0, PORTB

```

wait-0:

```

btsc PORTA, #0
bra wait-0
bra Start

```