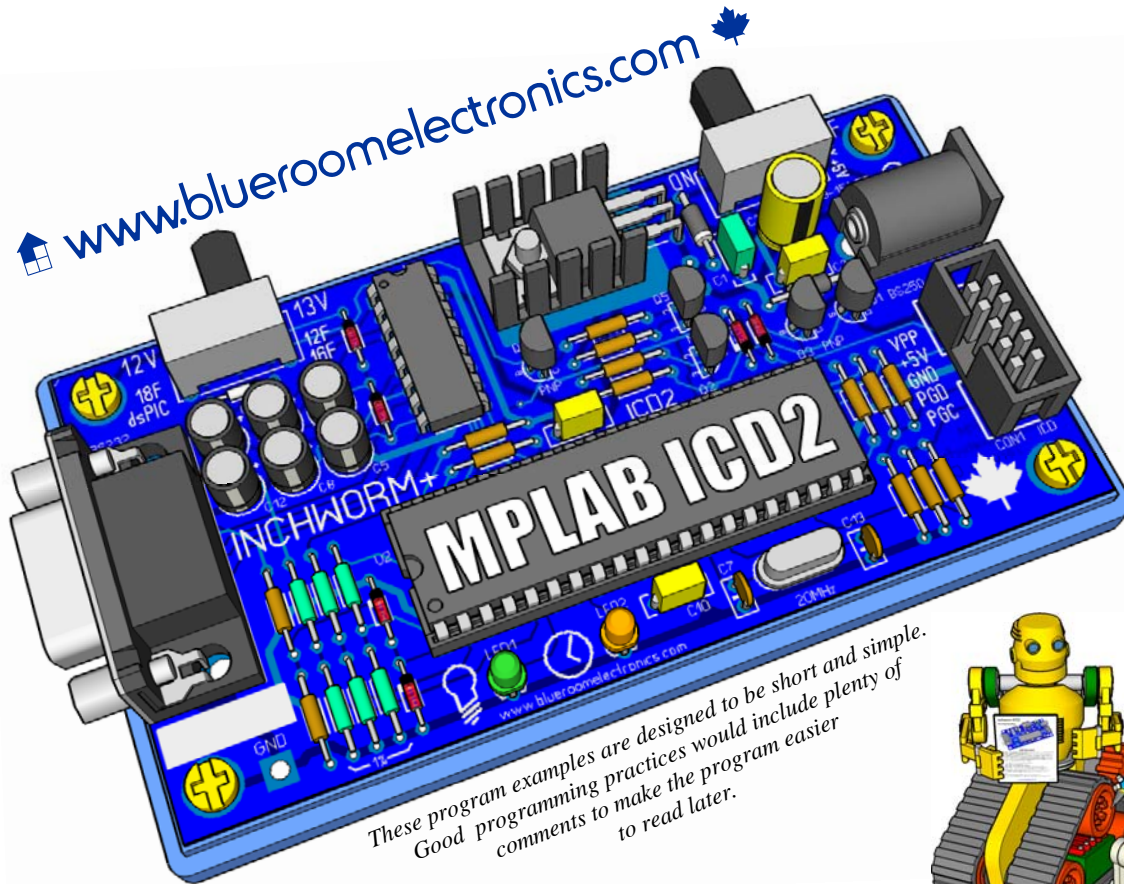
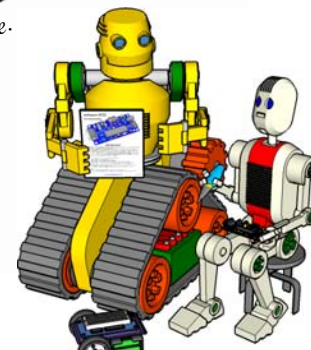


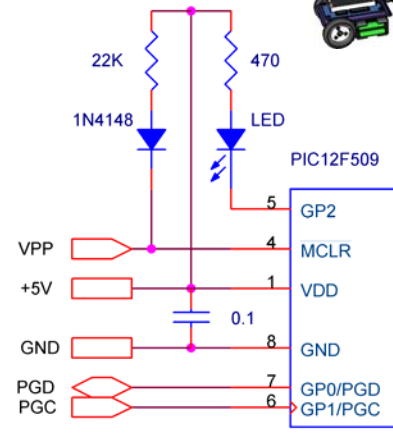
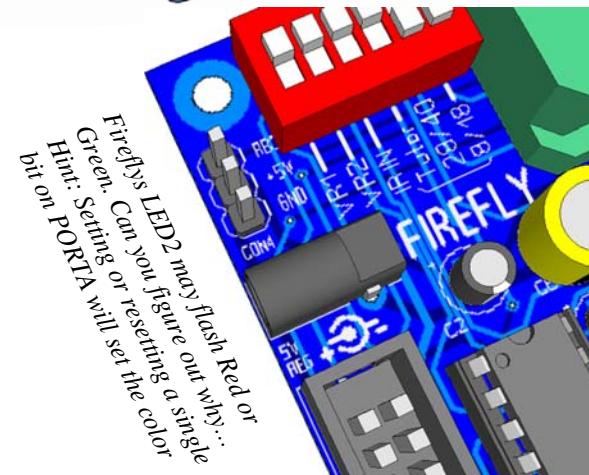
# Inchworm ICD2 Hello World



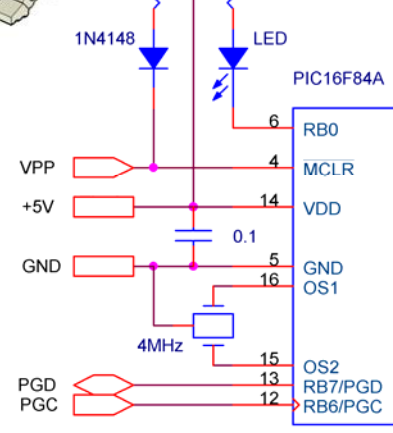
These program examples are designed to be short and simple. Good programming practices would include plenty of comments to make the program easier to read later.



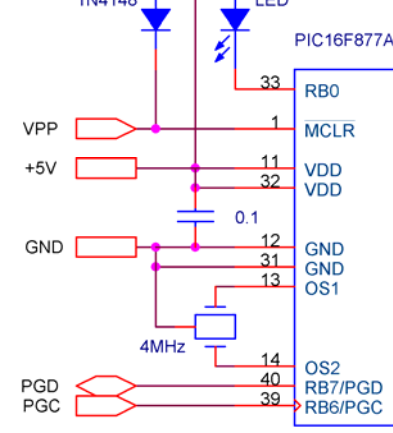
- 1 **Configure/ Select Device**  
(select your target PIC)
- 2 **File/ New** or **CTRL N**
  - Enter the program in the editor
  - File/ Save As.../Hello World.asm
- 3 **Project/ Wizard**  
(choose the following when prompted)
  - step 2 Microchip MPASM Toolsuite
  - step 3 Project name Hello World
  - step 4 Add Hello World.asm
- 4 **Programmer/ Select Programmer/ MPLAB ICD2**
  - **Settings/ Communication/ Com Port/ Com (1 or 2)**
  - **Connect** (Inchworms BUSY LED should flash)
- 5 **Build All** or **CTRL F10**  
(if the program doesn't build, check the program in the editor)
- 6 **Program** can be set to automatic after **Build All**  
(if not click on the program button or Programmer/Program)



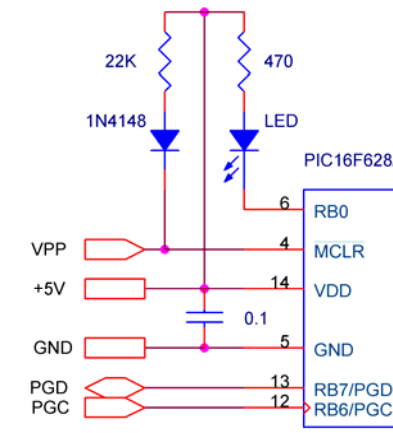
**12F509**



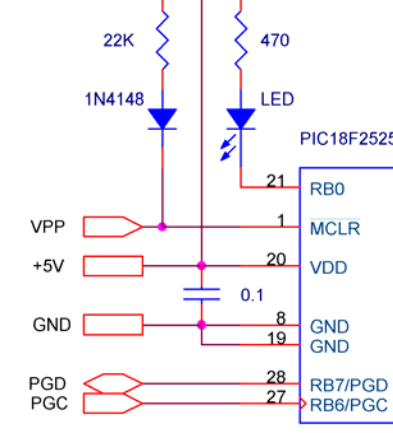
**16F84A**



**16F877A**



**16F628A**



**MONGOOSE / 18F2525**

```

*** WDT reset toggles LED2 (RA7)
list p=16F88
include <p16F88.inc>
__CONFIG __CONFIG1, 0x2F34
org 0
bsf STATUS, RP0
movlw b'00001110'
movwf OPTION_REG
movlw b'00111111'
movwf TRISA
bcf STATUS, RP0
movlw b'10000000'
xorwf PORTA, f
sleep
end
    
```

Only labels, declarations and comments are allowed in column 1, actual code requires indenting (spaces or tabs)

```

*** WDT reset toggles GP2
list p=12F509
include <p12F509.inc>
__CONFIG 0x0FFE
org 0
movlw b'00001110'
option
movlw b'11111011'
tris GPIO
movlw b'00000100'
xorwf GPIO, f
sleep
end
    
```

XOR "eXclusive OR" can be used to invert bits, this causes the LED to blink

```

*** WDT reset toggles RB0
list p=16F84A
include <p16F84A.inc>
__CONFIG 0x3FF5
org 0
bsf STATUS, RP0
movlw b'00001110'
movwf OPTION_REG
bcf TRISB, 0
bcf STATUS, RP0
1
movlw xorwf PORTB, f
sleep
end
    
```

Consider using a modern PIC with a built in oscillator like the 16F628A PS if you're using a 4MHz crystal add a 27pf capacitor between each crystal leg and ground (GND)

```

*** WDT reset toggles RB0
list p=16F877A
include <p16F877A.inc>
__CONFIG 0x3F7D
org 0
bsf STATUS, RP0
movlw b'00001110'
movwf OPTION_REG
bcf TRISB, 0
bcf STATUS, RP0
1
movlw xorwf PORTB, f
sleep
end
    
```

Consider using a modern PIC with a built in oscillator like the 16F887. Note: the 4MHz device is a resonator with built in capacitors

```

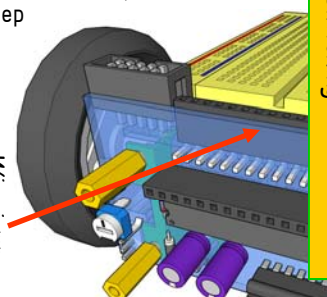
*** WDT reset toggles RB0
list p=16F628A
include <p16F628A.inc>
__CONFIG 0x3F34
org 0
bsf STATUS, RP0
movlw b'00001110'
movwf OPTION_REG
bcf TRISB, 0
bcf STATUS, RP0
1
movlw xorwf PORTB, f
sleep
end
    
```

If you want hardware A/D and/or debug mode use the 16F88 instead

```

*** WDT reset toggles RC0
list p=18F2525
include <p18F2525.inc>
CONFIG OSC=INTIO67, LVP=OFF
CONFIG WDT=ON, WDTPS=128
org 0
bcf TRISC, 0
btg LATC, 0
sleep
end
    
```

18 Series PICs use a different CONFIG format than 16 series PICs Notice that the 18 series PICs require much less bank switching



Tip: On PICs that support Debug (16F88 (Firefly), 16F87x, 18F, etc) you can modify the program by changing the SLEEP command to GOTO 0x000 (GOTO 0x000 will simulate a reset) The WDT & LVP must be disabled in debugger mode; so allow MPLAB to disable them when using the debugger or add & \_WDT\_OFF to the CONFIG line Remember: Use the View/Watch and watch PORTA or PORTB as you single step the program.

The LED should flash slightly slower than 1Hz. This is the WDT (Watchdog Timer) timing out and resetting the PIC. The LED flashes because the bit is inverted xorwf every time the program has restarted. A WDT reset does not modify user RAM