

ECSESS

RoboElectronics

Programming a micro controller

Goals for Today

- Hook up pic16f88 properly and upload code
- Write a program which turns on an LED
- Write a program which flashes LED/s using a delay()
- Use an IR/phototransistor to trigger an action

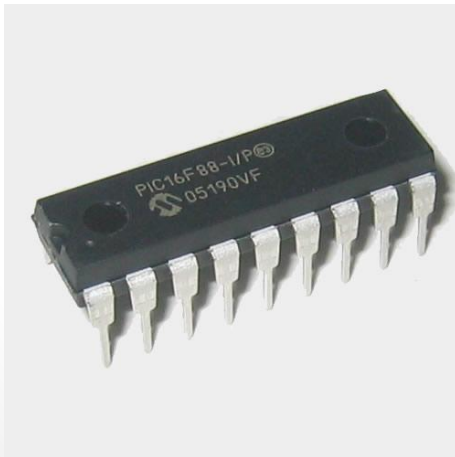
Next Week

- Learning how to use an ADC
- Learning how to find the find distance using the debugger and Pickit3



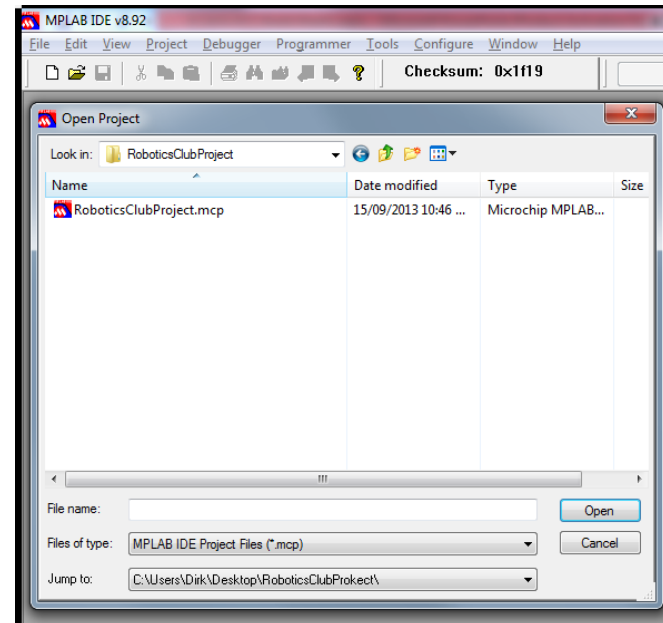
Required Material

- Circuit
 - Breadboard
 - PIC16F88
 - PicKit3
 - Yellow & blue LED
 - 100, 150, 10k ohm resistor
 - IR/Phototransistor pair
- Robot
 - Start building your chassis

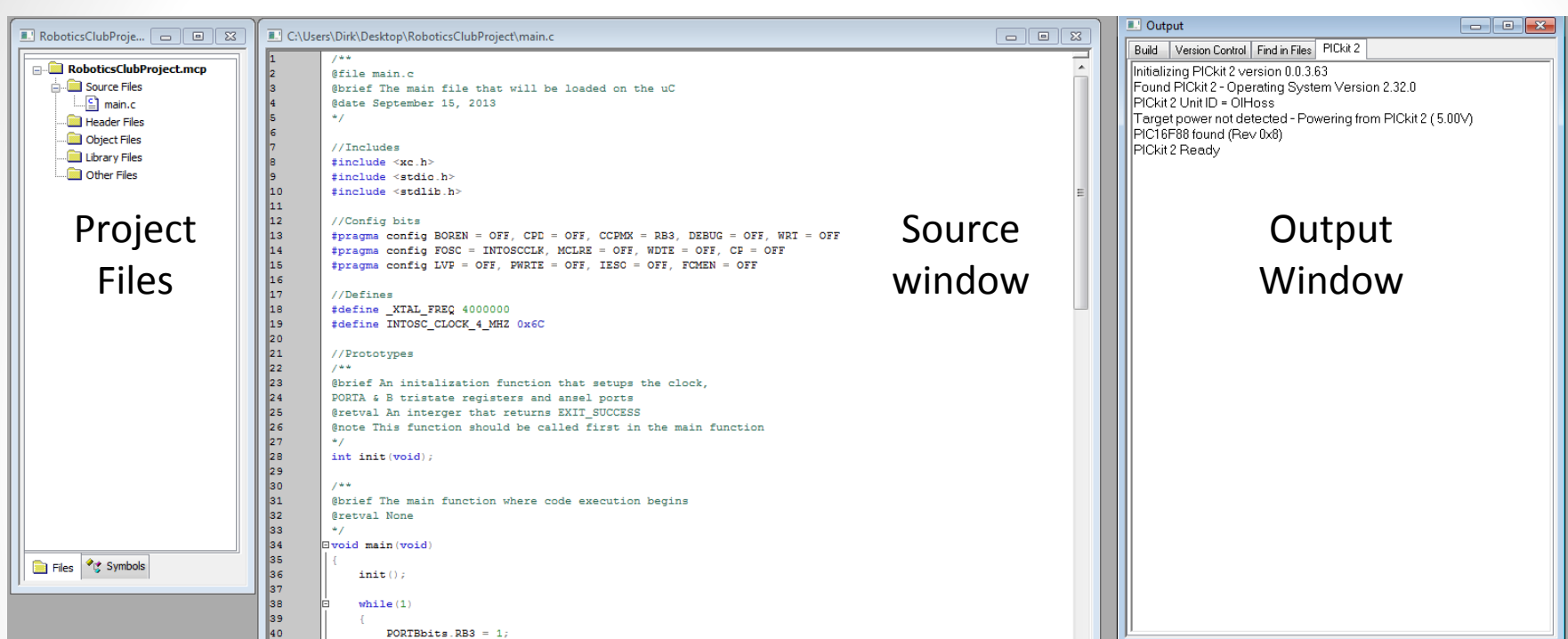


Setting up MPLAB IDE

- Install all the software
- Open MPLAB IDE
 - Go to Project, Open Project
 - Select the RoboElectronicsProject.mcp in the provided project file
- The project should be configured and ready to go
 - Be sure to **plug in your PicKit3** before you open the project



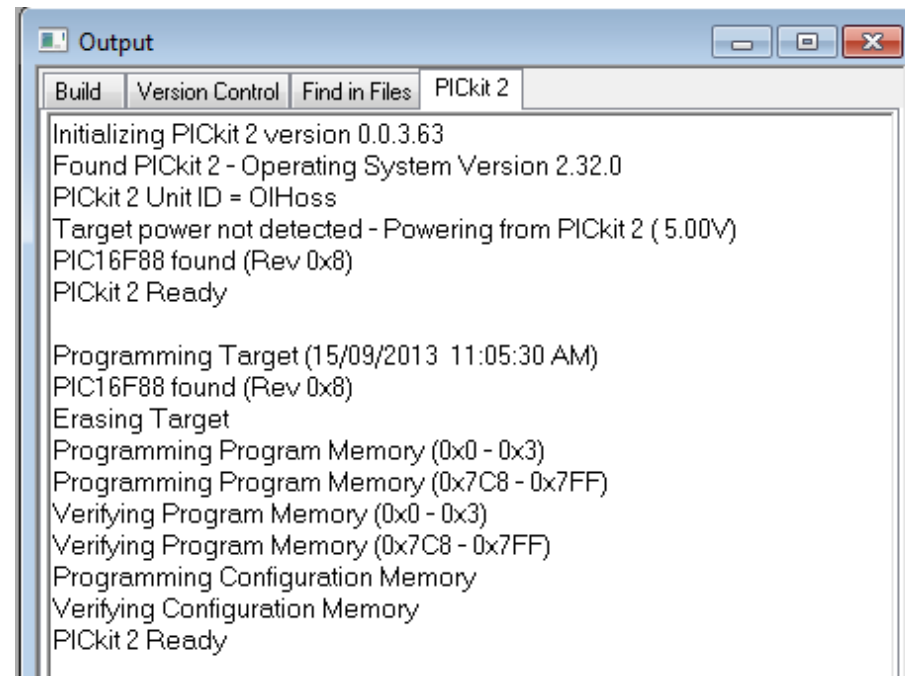
Using MPLAB IDE



- The left window contains project files
- The middle window is your open source file
- The right window shows the output
 - This displays build and programming errors
 - When you open your project the PicKit3 tab should say “PICKit3 ready “ on the last line

Programming with MPLAB IDE

- To build your project go to
 - Project
 - Build (F10)
- This will compile your project and display any errors in the **Output** window
- If your code compiled without any errors it will send it to your programmer
- Your 16F88 should now be programmed with your code



```
Output
Build Version Control Find in Files PICKit 2
Initializing PICKit 2 version 0.0.3.63
Found PICKit 2 - Operating System Version 2.32.0
PICKit 2 Unit ID = 01Hoss
Target power not detected - Powering from PICKit 2 ( 5.00V)
PIC16F88 found (Rev 0x8)
PICKit 2 Ready

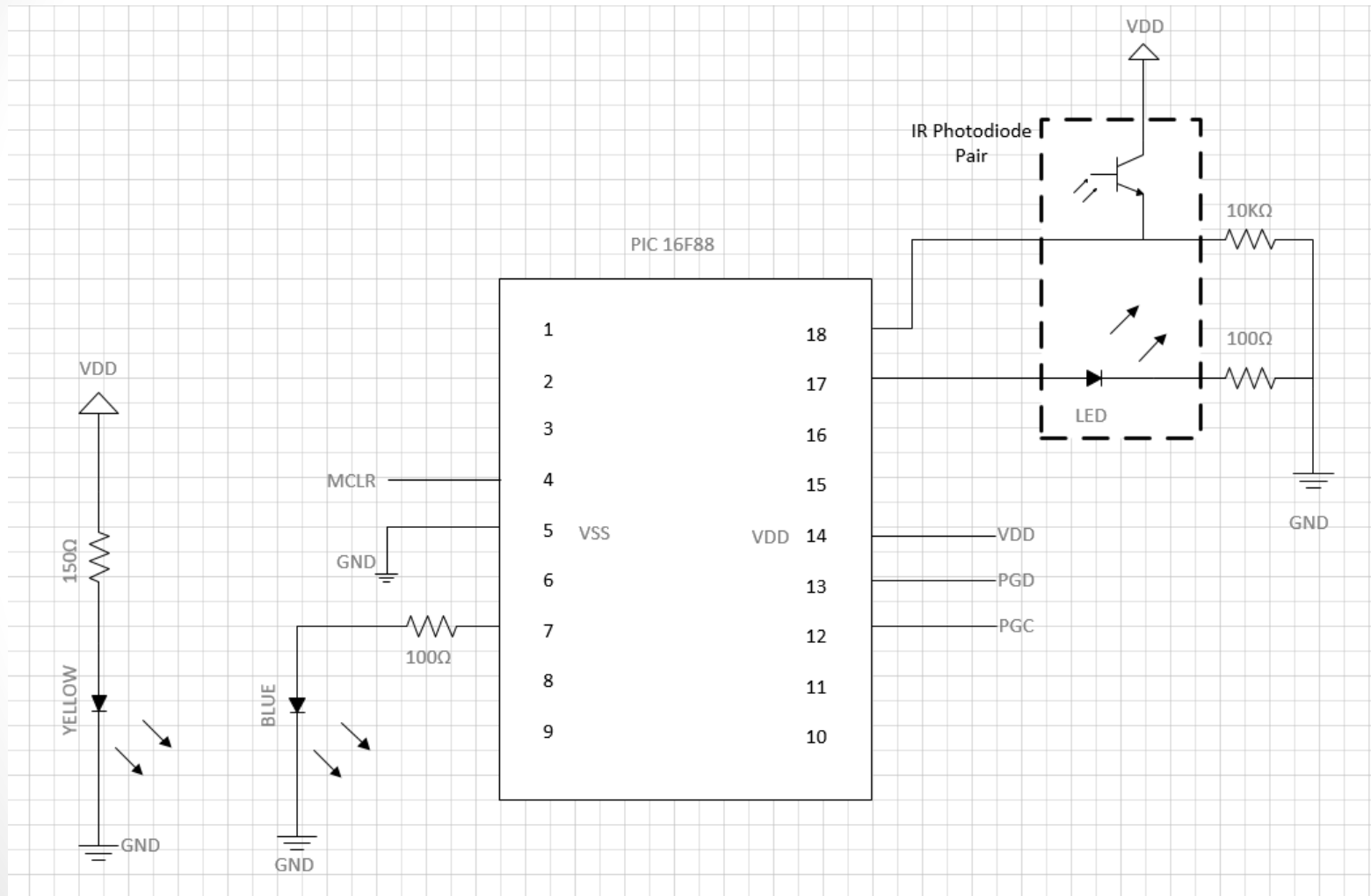
Programming Target (15/09/2013 11:05:30 AM)
PIC16F88 found (Rev 0x8)
Erasing Target
Programming Program Memory (0x0 - 0x3)
Programming Program Memory (0x7C8 - 0x7FF)
Verifying Program Memory (0x0 - 0x3)
Verifying Program Memory (0x7C8 - 0x7FF)
Programming Configuration Memory
Verifying Configuration Memory
PICKit 2 Ready
```

Common problems with MPLAB IDE and PicKit3

- Q: My Pickit 3 says it doesn't recognize my device
 - A: Are you sure you correctly connected your Pickit 3 to the PIC16F88 ?
- Q: I get a huge list of build errors, what do I do with it?
 - A: Often one error can generate others deal with the **first error** in the list and build again
- Q: Can I connect other things to the programming lines?
 - A: No. Easy right?



Circuit to Build



Resources

- Software
 - XC8 Compiler: <http://www.microchip.com/mplabxc8windows>
 - MPLABX IDE: <http://www.microchip.com/pagehandler/en-us/family/mplabx/>
- Datasheets
 - PIC16F88: <http://ww1.microchip.com/downloads/en/DeviceDoc/30487D.pdf>
 - PIC16F88 XC8 header file (on your local machine): C:\Program Files (x86)\Microchip\xc8\v1.12\include\pic16f88.h
- Further Reading
 - Pickit2 Programming Guide: <http://ww1.microchip.com/downloads/en/DeviceDoc/51553E.pdf>
 - C tutorial: <http://www.learn-c.org/>