

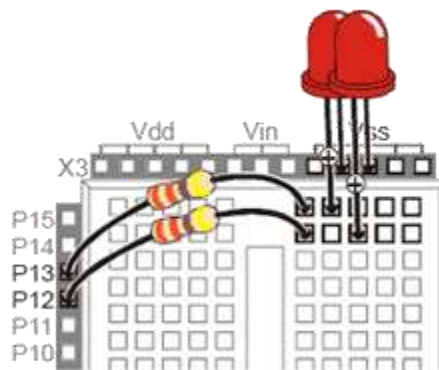
## CS257: Applied Robotics & Embedded Programming

Courtesy of by Jeff Mowbray at Collingwood Collegiate Institute  
Computer Engineering & Robotics Dept.

### Lesson 3: Working With LED'S and the Basic Stamp

#### 1. Connecting two LEDs

LEDs can be connected to the breadboard by wiring the anode (+) to one of the pins on the left column of the breadboard using an appropriate resistor (eg,  $220\Omega$ ), then grounding the cathode (-) to one of the Vss pins on the top of the Board of Education as follows:



#### 2. Learning about PBasic Programming

The BASIC Stamp microcontroller chip is programmed using a simple version of the BASIC language known as Parallax BASIC, or PBASIC.

(Note - the **BASIC Stamp Editor** software must be installed on the host PC before the BASIC Stamp chip can be programmed).

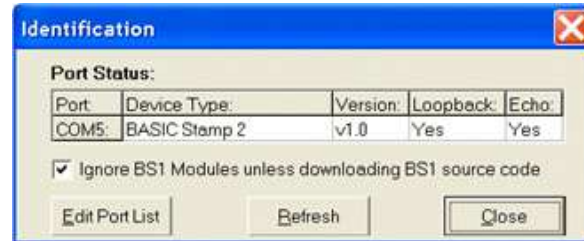
To program the BASIC Stamp chip,



1. Connect the Board of Education to your PC using a serial or USB cable.
2. Start the BASIC Stamp editor program from the host PC.
3. Turn the power switch on the Board of Education to position "1".

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- In the BASIC Stamp editor program, choose **Run > Identify** from the menu bar. If the Board of Education has been connected properly, you should see a dialog similar to the following:



- Insert PBASIC directives to indicate the language and version as follows:
  - Click the **Stamp Mode: BS2** icon () on the menu bar.
  - Click the **PBASIC Language: 2.5** icon () on the menu bar.

Enter the program in the editor window. The LEDs are turned on or off by sending high or low voltage to the pins connected to the LEDs. This can be done using the following PBASIC code:

```
' {$STAMP BS2}
' {$PBASIC 2.5}
' This code will cause the LED connected
to pin 13
' to blink on and off in a 1s interval.
DO
  HIGH 13  'Signal ON to pin 13 (LED
on)
  PAUSE 500 'Wait 0.5s
  LOW 13   'Signal OFF to pin 13 (LED
off)
  PAUSE 500 'Wait 0.5s
LOOP
END
```

Since you have two LED's connected to the breadboard, modify your program so the one attached to pin 12 will blink also. Experiment with different settings so can vary how long the LED's are on and off.