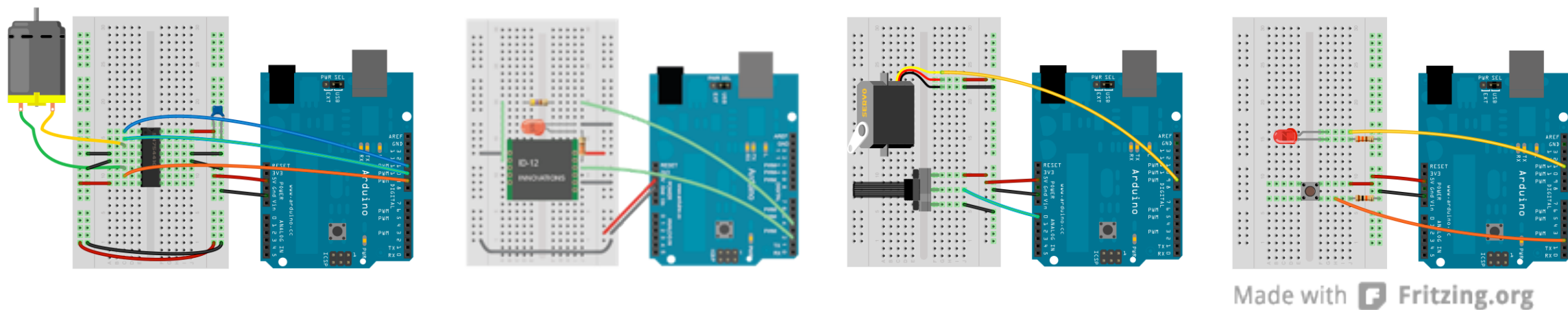


# Schematics for Breakout Examples



This document contains wiring diagrams and component lists for the examples. A diagram may be used for more than one example file. The corresponding files are listed for each diagram.

# Getting Started: Hello World

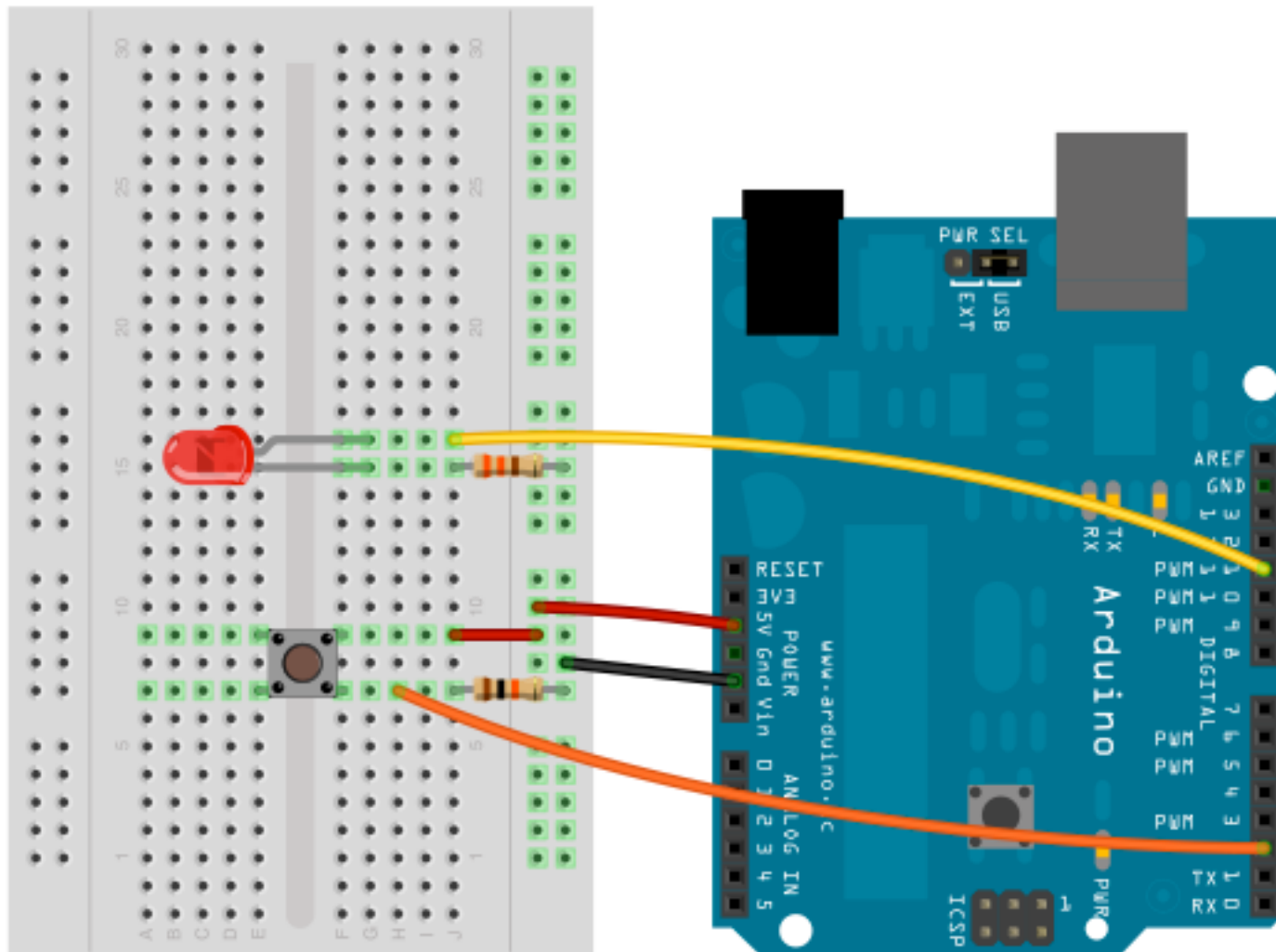
[/examples/getting\\_started/hello\\_world.html](/examples/getting_started/hello_world.html)

[/examples/getting\\_started/hello\\_world\\_node.html](/examples/getting_started/hello_world_node.html)

[/examples/processing\\_js/basic\\_example.html](/examples/processing_js/basic_example.html)

## Component List

- Button
- Led
- 10k resistor
- 330 ohm resistor

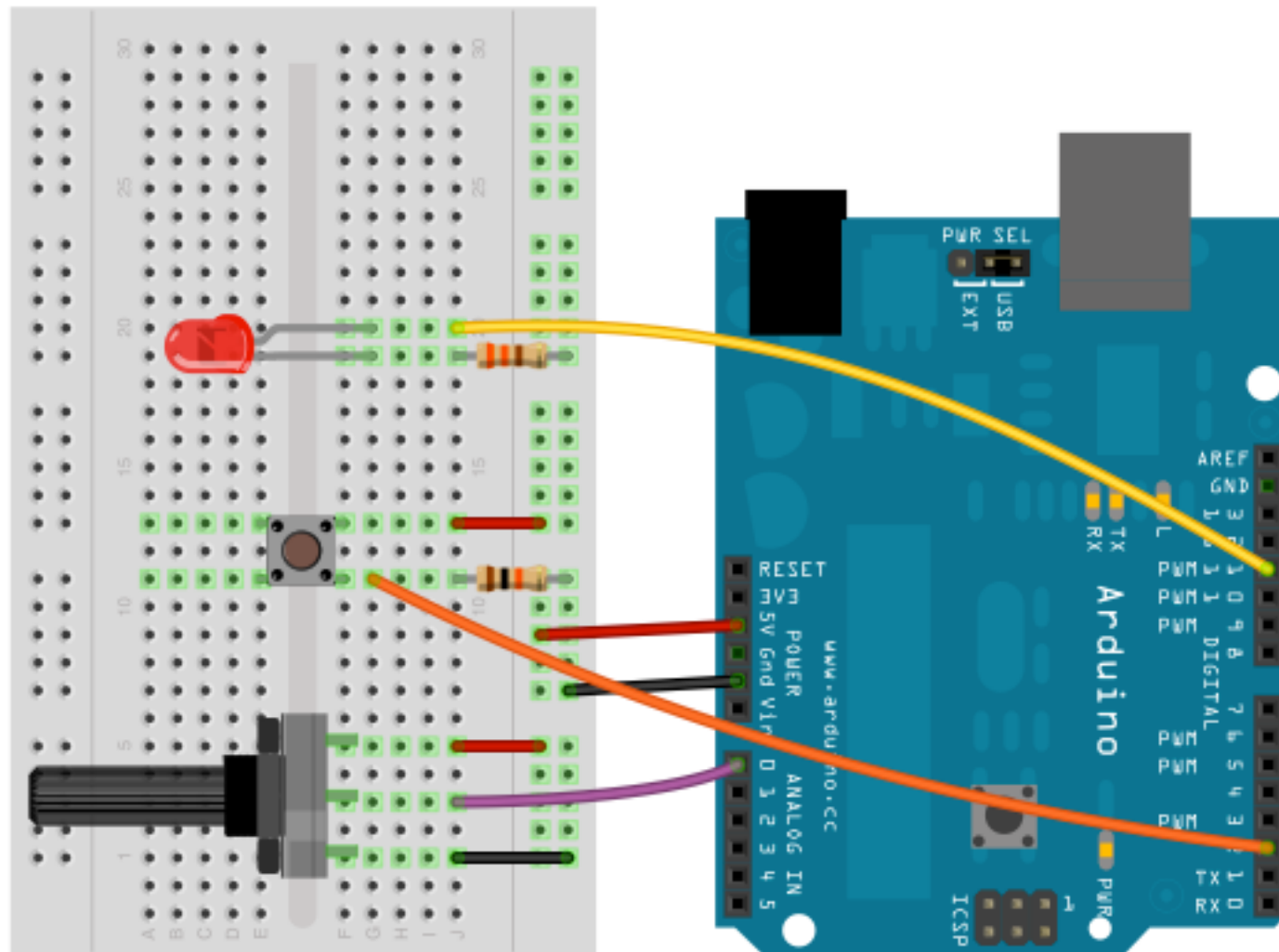


# Getting Started: All Examples

Use this schematic for all of the examples in `/examples/getting_started/`

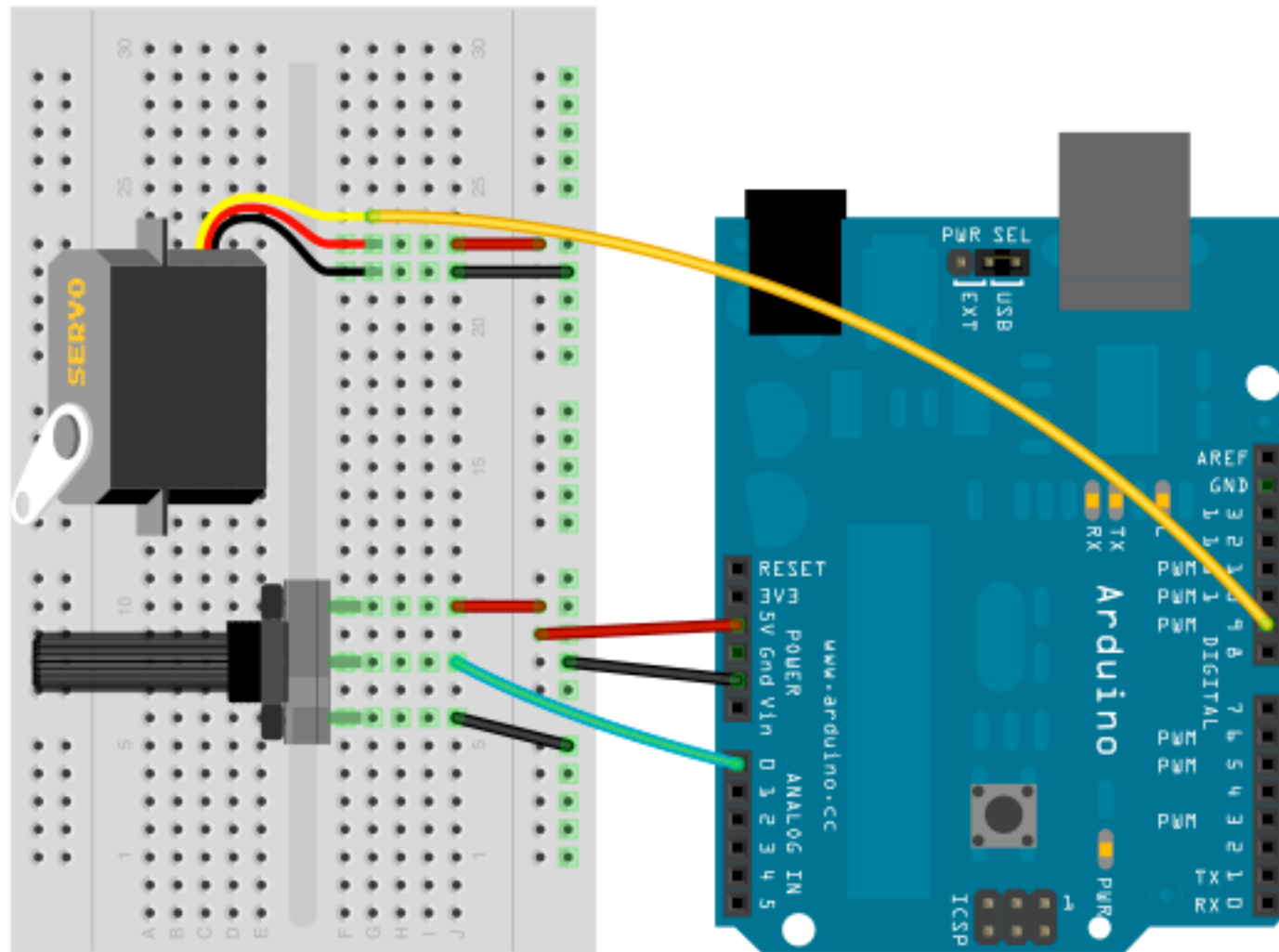
## Component List

- Potentiometer
- Button
- Led
- 10k resistor
- 330 ohm resistor



# Actuators: Servo

</examples/actuators/servo.html>

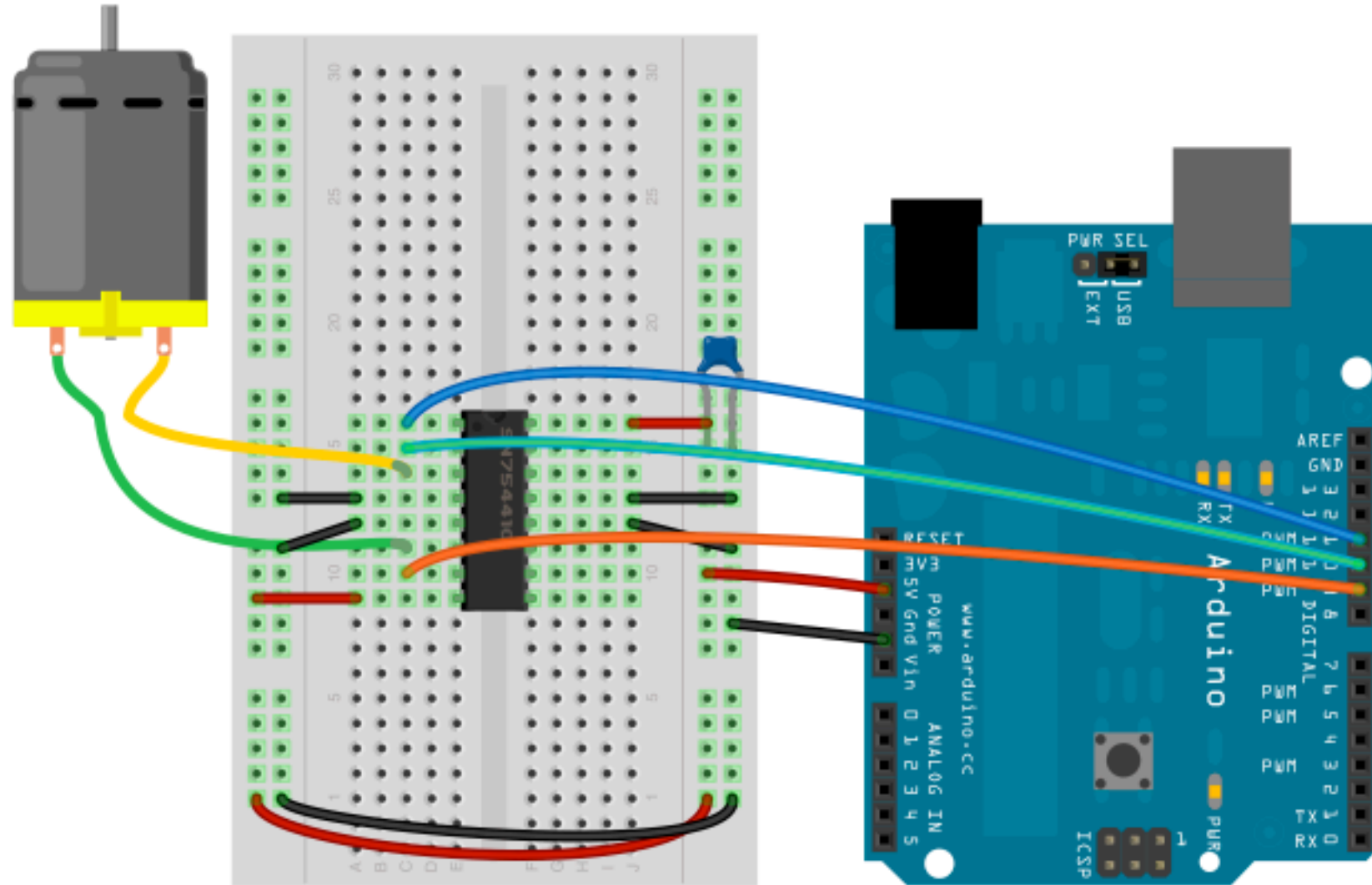


## Component List

- Servo motor
- Potentiometer

# Actuators: DC Motor

</examples/actuators/DCmotor.html>



Note that in this schematic the motor is powered by the Arduino. If you connect anything to the motor you should use an external power supply for the motor. See the schematic on the next page.

## Component List

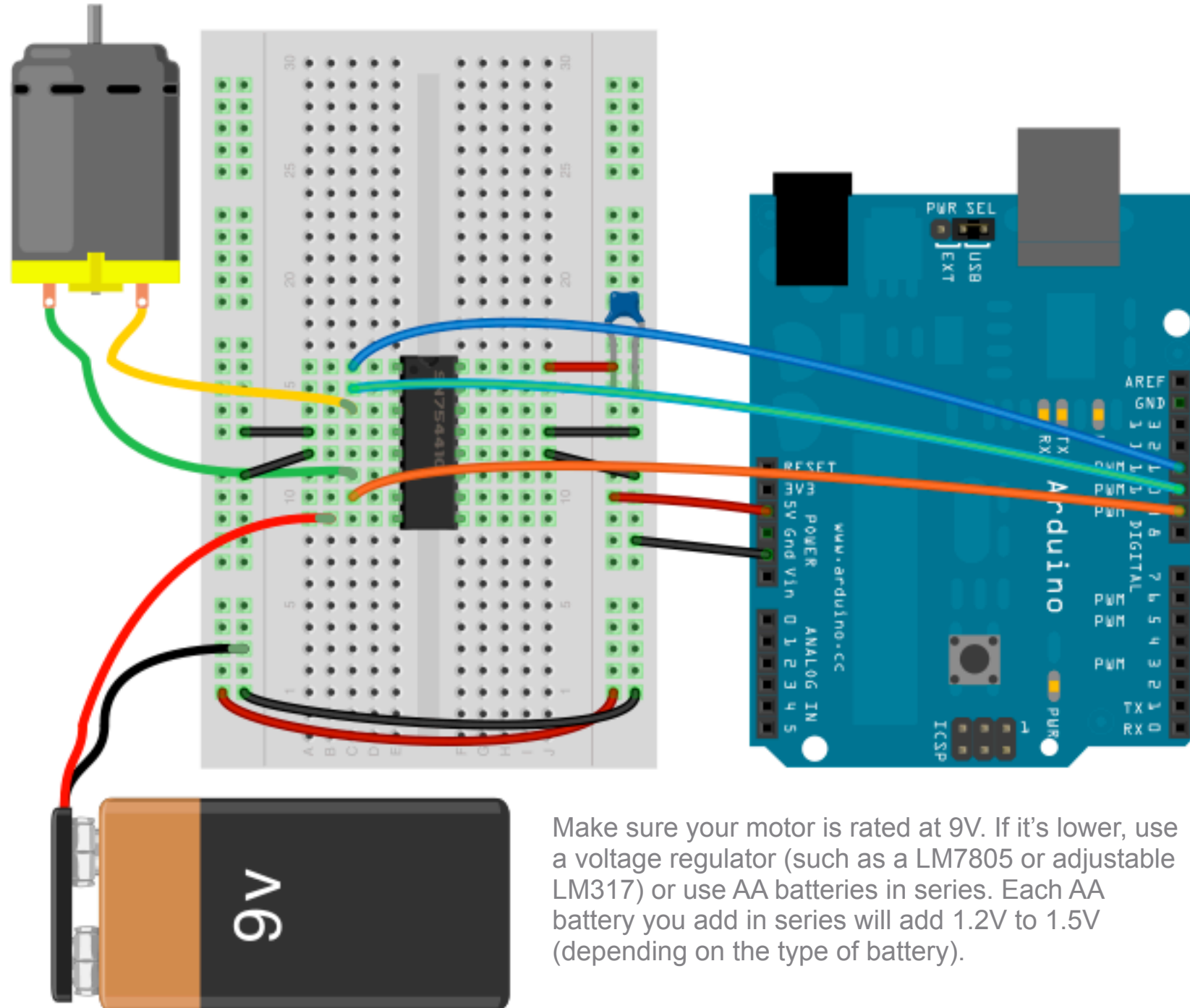
- DC motor
- 0.1  $\mu$ F capacitor
- H-bridge SN754410 or equivalent

# Actuators: DC Motor (with external power supply)

</examples/actuators/DCmotor.html>

## Component List

- DC motor
- 0.1  $\mu\text{F}$  capacitor
- 9V battery & holder
- H-bridge SN754410 or equivalent



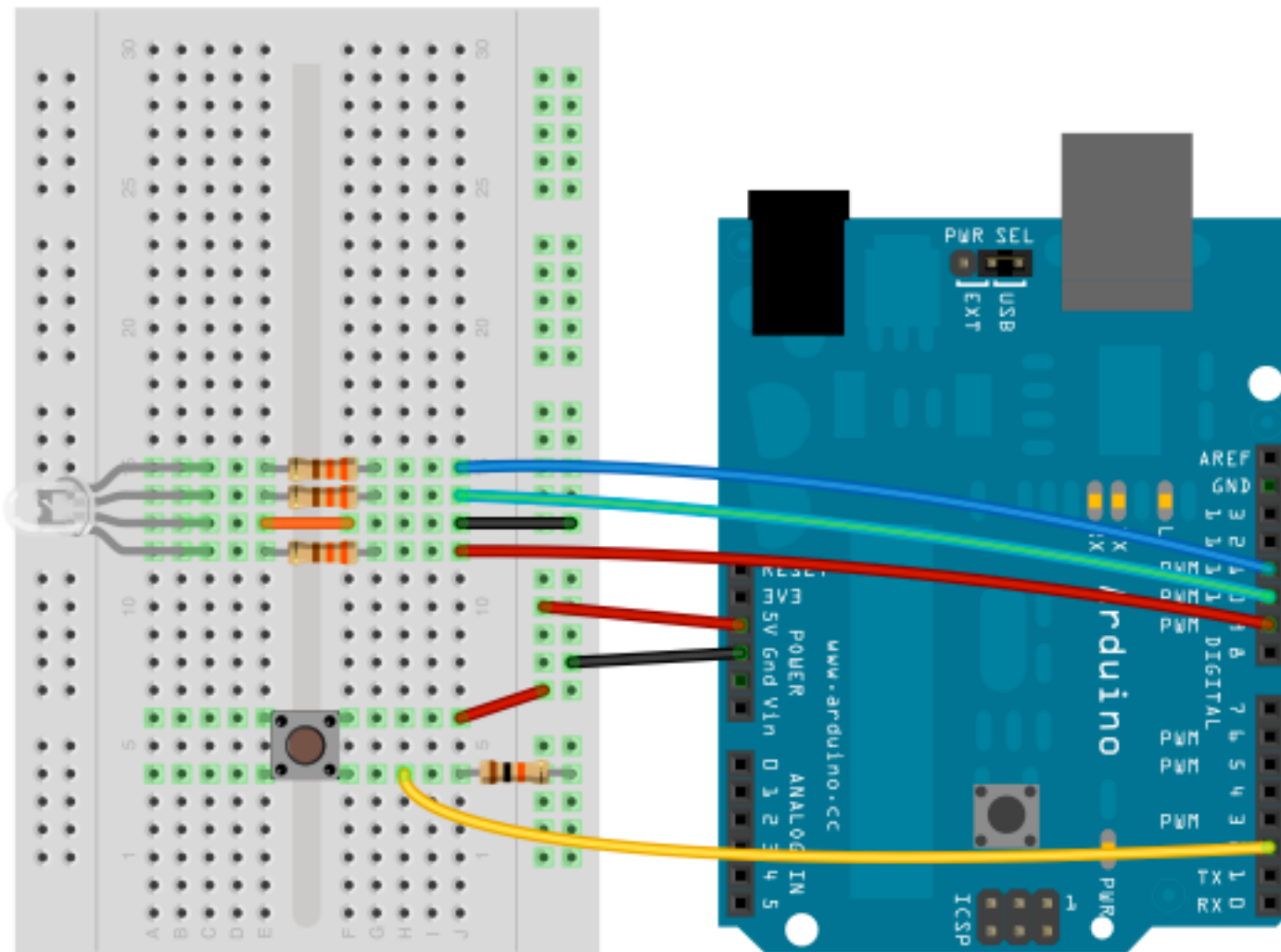


# Actuators: RGB Led (Common Cathode)

[/examples/actuators/rgb\\_led.html](/examples/actuators/rgb_led.html)

## Component List

- RGB led
- 3 330 ohm resistors
- Button
- 10k resistor



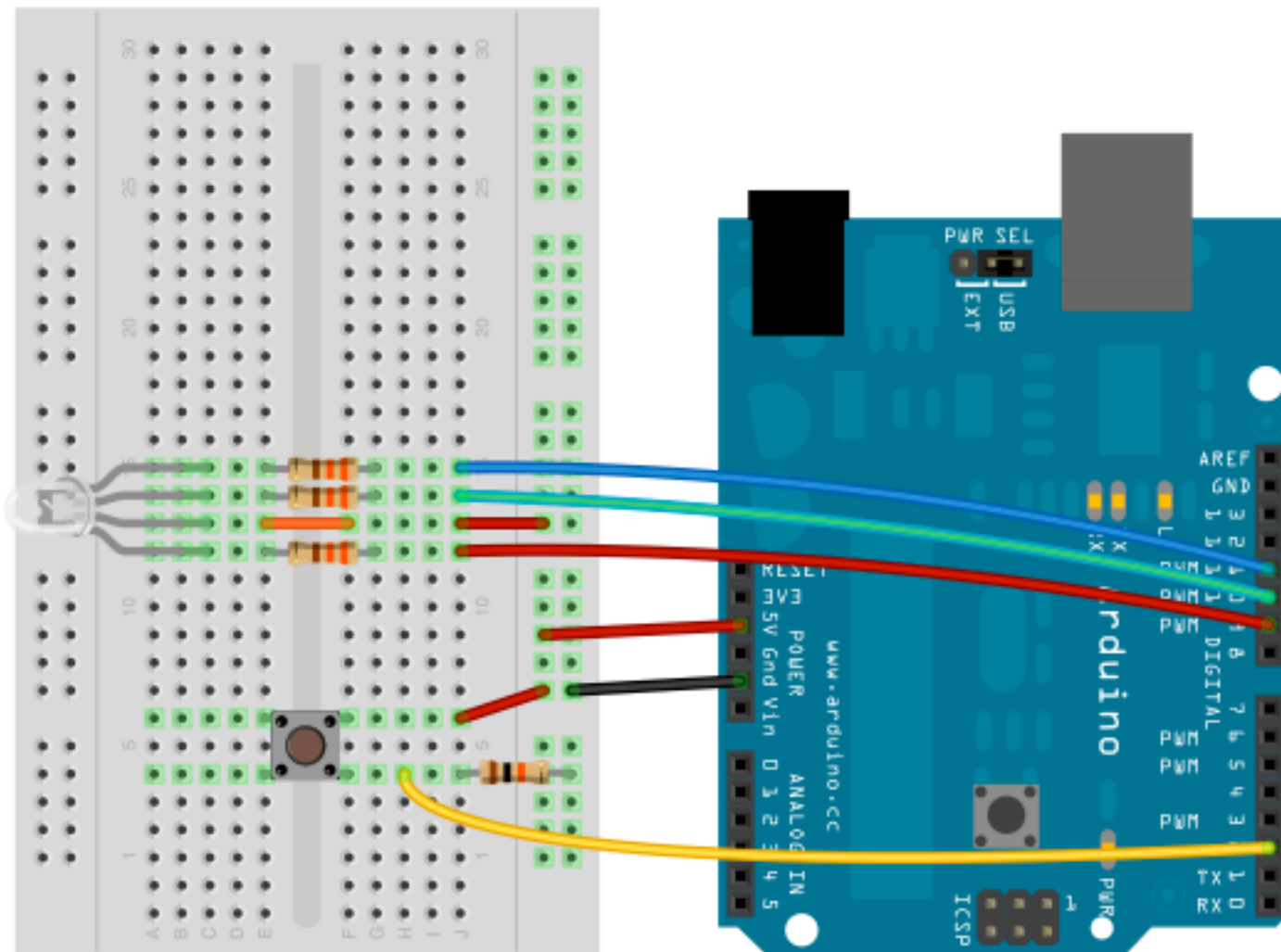
Check the data sheet for the LED to determine if it is common cathode or common anode

# Actuators: RGB Led (Common Anode)

[/examples/actuators/rgb\\_led.html](/examples/actuators/rgb_led.html)

## Component List

- RGB led
- 3 330 ohm resistors
- Button
- 10k resistor



Check the data sheet for the LED to determine if it is common cathode or common anode.

Note: In the `rgb_led.html` example change `COMMON_CATHODE` to `COMMON_ANODE` on line 104.

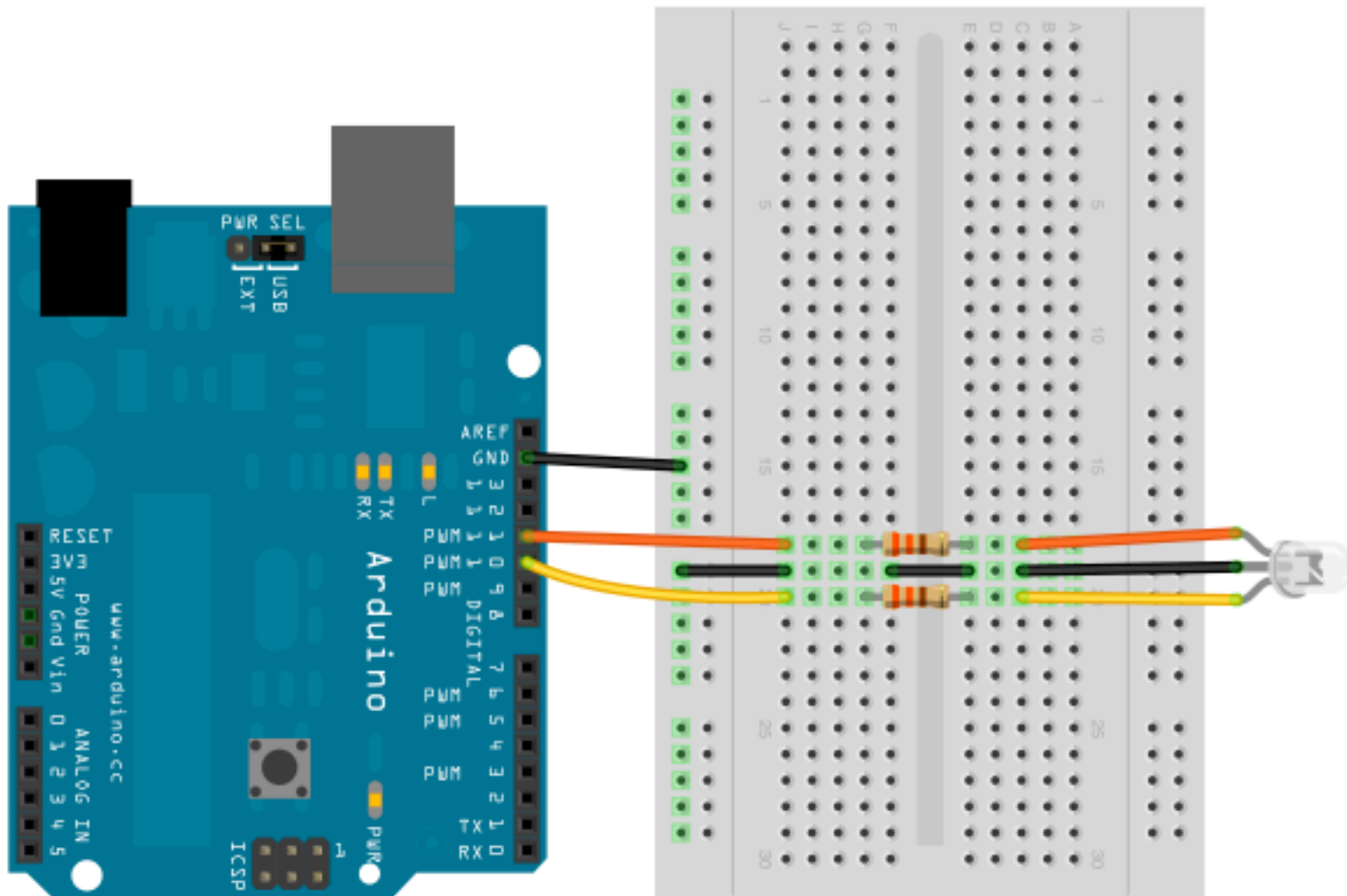


# Actuators: Bi-Color Led (Common Cathode)

[/examples/actuators/bi\\_color\\_led.html](/examples/actuators/bi_color_led.html)

## Component List

- Bi-Color led
- 2 330 ohm resistors



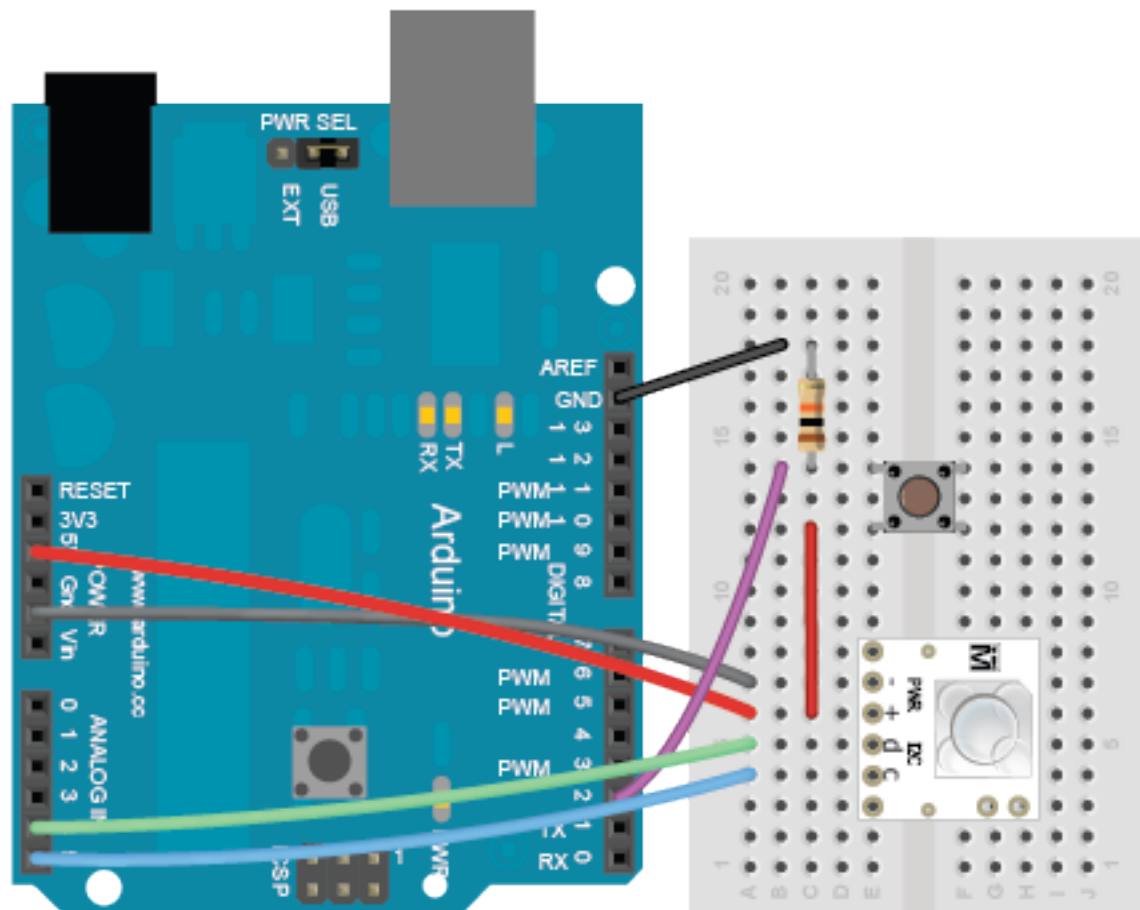
Check the data sheet for the LED to determine if it is common cathode or common anode.

# Actuators: BlinkM RGB Led Module

</examples/actuators/blinkM.html>

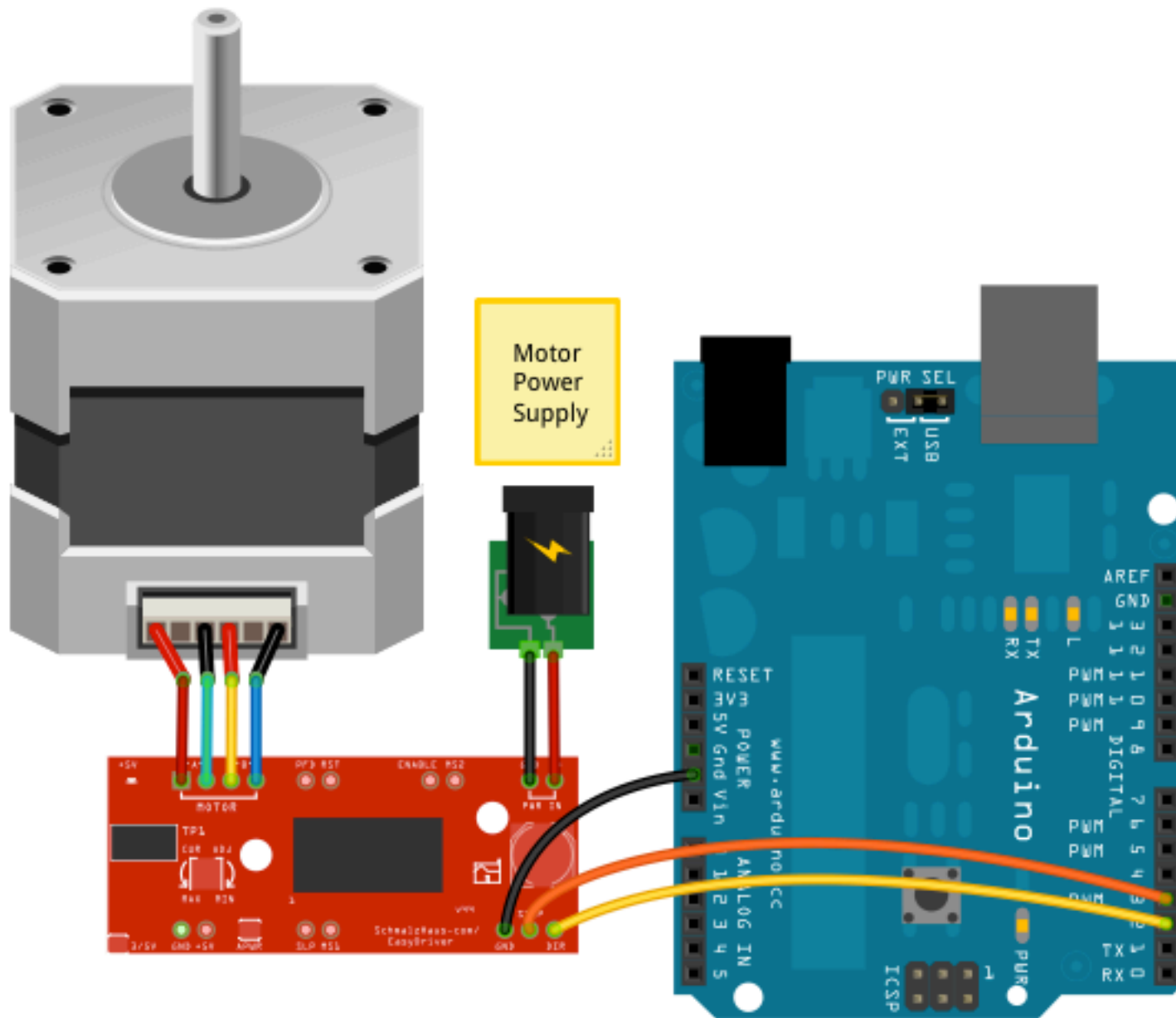
## Component List

- BlinkM led module
- Button
- 10k resistor



# Actuators: Stepper Motor (EasyDriver)

/examples/actuators/stepper\_easydriver.html



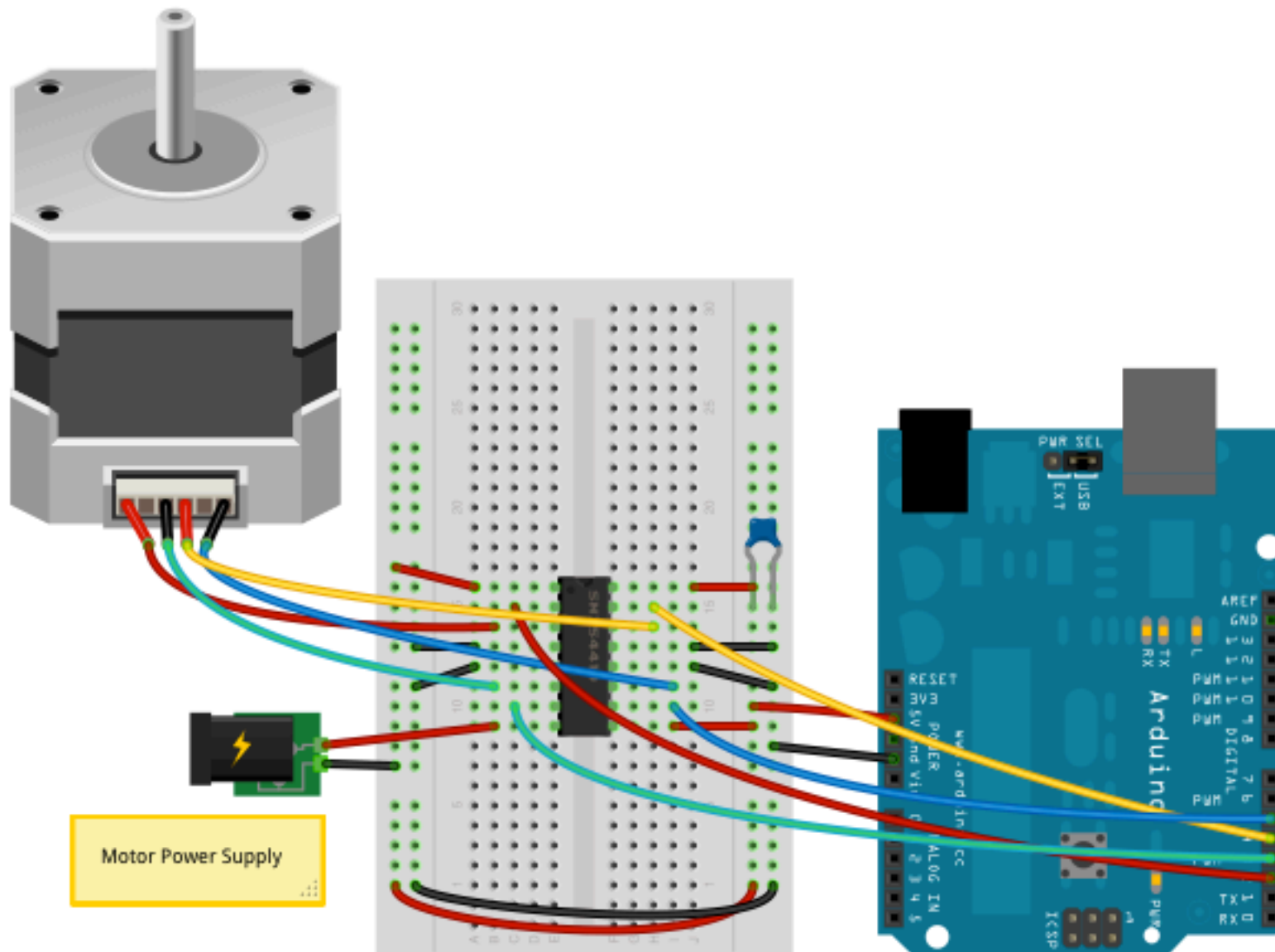
## Component List

- Bipolar stepper motor
- EasyDriver motor driver
- DC Power supply for motor

Power your motor with separate DC power supply at the voltage recommended for your particular stepper motor. See this tutorial on bildr.org for more info on using the EasyDriver with Arduino: <http://bildr.org/2011/06/easydriver/>. EasyDriver website: <http://schmalzhaus.com/EasyDriver/>.

# Actuators: Stepper Motor (4-wire driver)

[/examples/actuators/stepper\\_4wire.html](/examples/actuators/stepper_4wire.html)



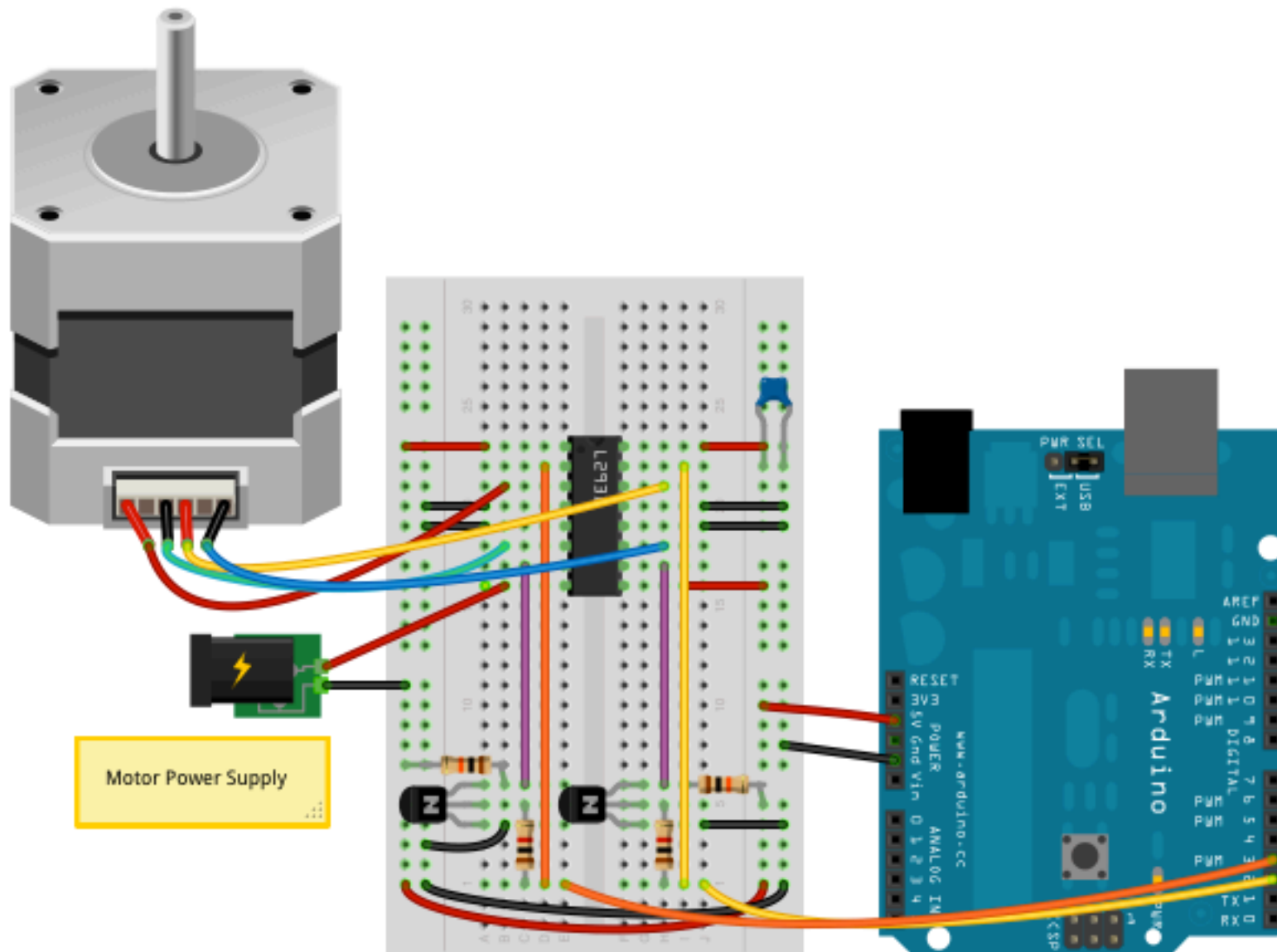
## Component List

- Bipolar stepper motor
- SN754410NE H-bridge
- DC Power supply for motor

Power your motor with separate DC power supply at the voltage recommended for your particular stepper motor. See this tutorial by Tom Igoe for more info on 2 and 4 wire stepper motor circuits for bipolar and unipolar stepper motors:  
<http://www.tigoe.com/pcomp/code/circuits/motors/stepper-motors/>.

# Actuators: Stepper Motor (2-wire driver)

[/examples/actuators/stepper\\_2wire.html](/examples/actuators/stepper_2wire.html)



## Component List

- Bipolar stepper motor
- L293D H-bridge
- DC Power supply for motor
- 2 10k resistors
- 2 1k resistors
- 2 NPN transistors

Power your motor with separate DC power supply at the voltage recommended for your particular stepper motor. See this tutorial by Tom Igoe for more info on 2 and 4 wire stepper motor circuits for bipolar and unipolar stepper motors:  
<http://www.tigoe.com/pcomp/code/circuits/motors/stepper-motors/>.

# Filters: Filtering Analog Input

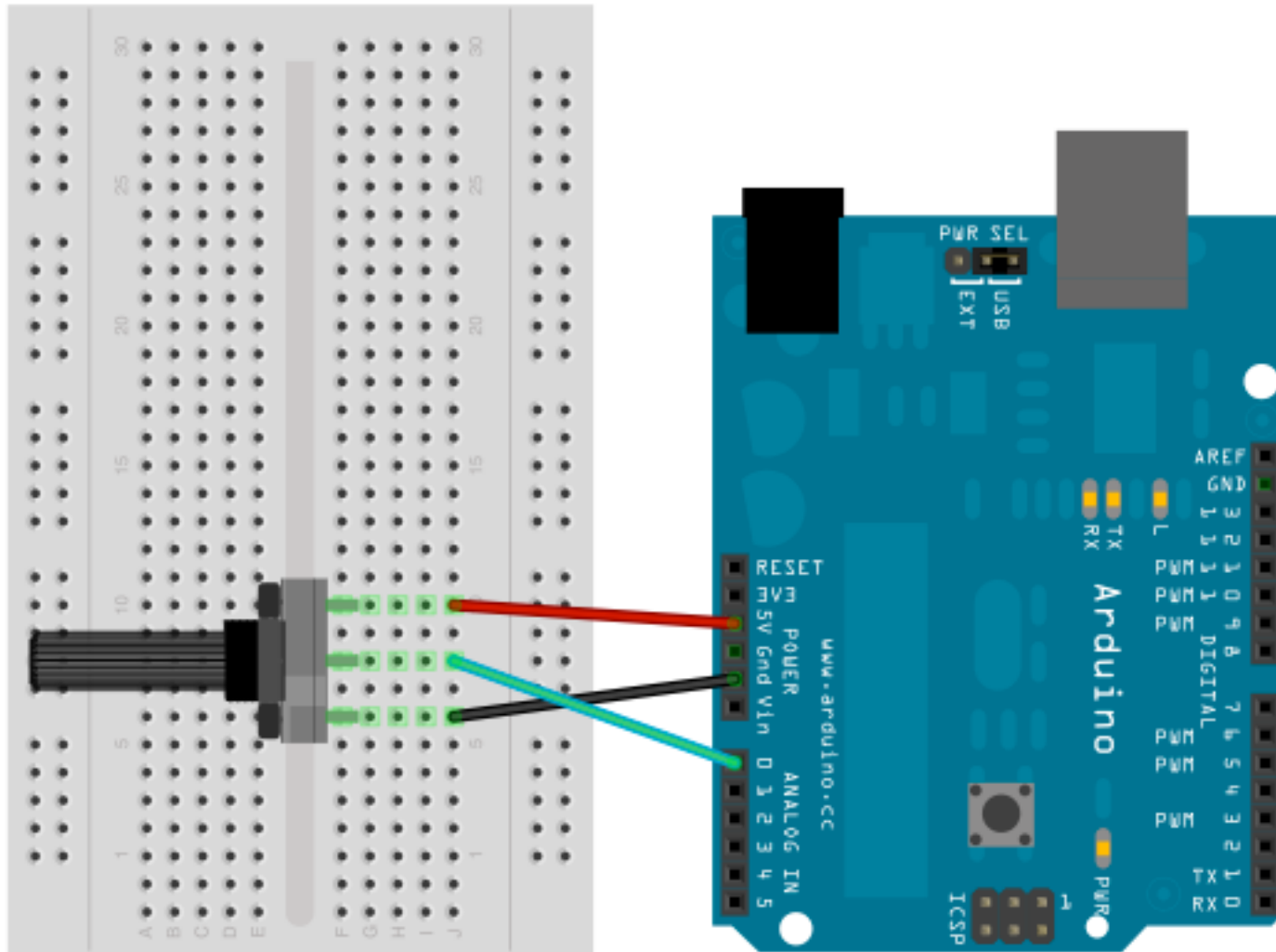
</examples/filters/convolution.html>

</examples/filters/scaler.html>

</examples/filters/triggerpoint.html>

## Component List

- Potentiometer





# Filters: Filtering Analog Input

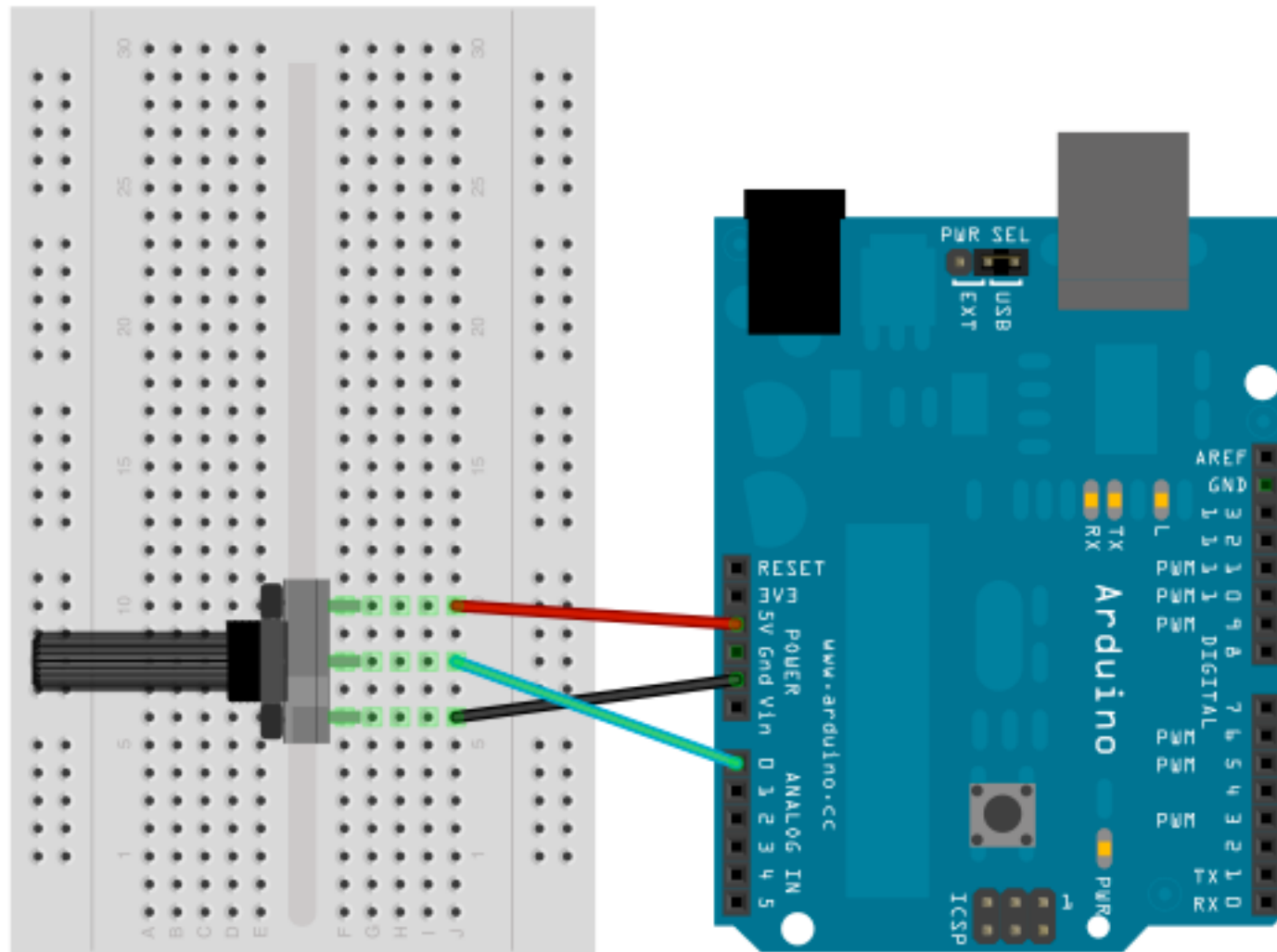
</examples/filters/convolution.html>

</examples/filters/scaler.html>

</examples/filters/triggerpoint.html>

## Component List

- Potentiometer

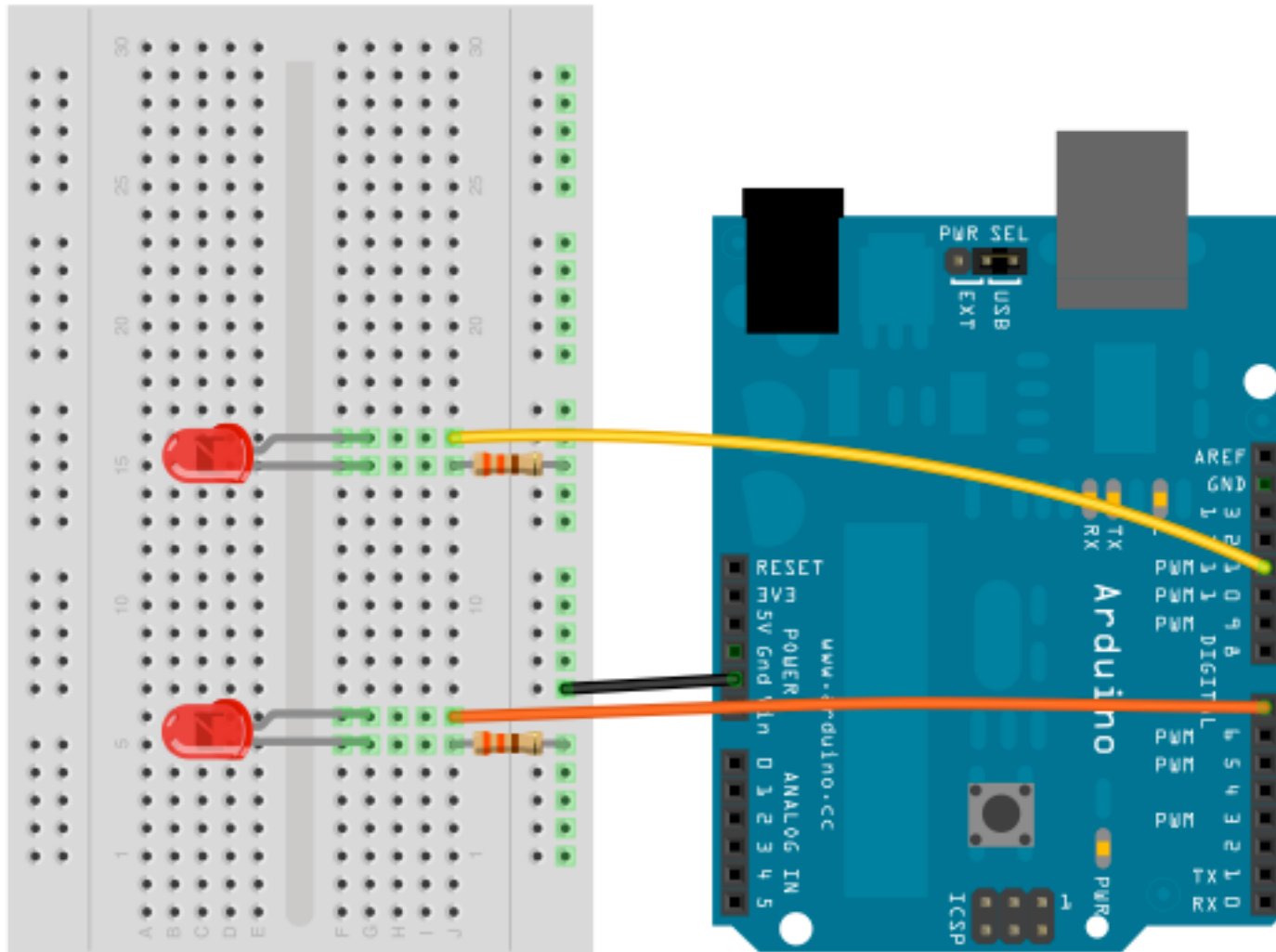


# Generators: Generating Output Signals

</examples/generators/oscillator.html>

## Component List

- 2 Leds
- 2 330 ohm resistors

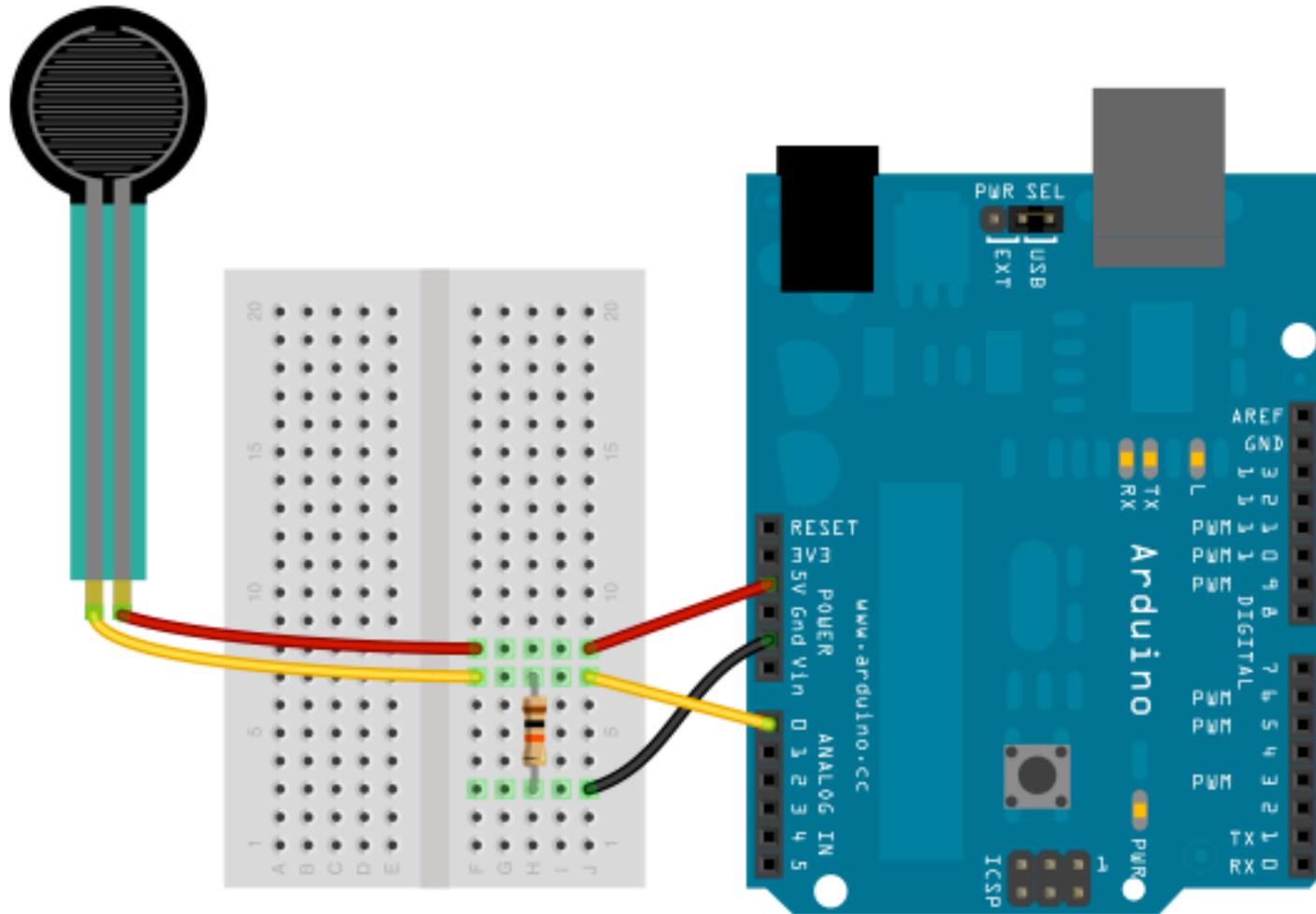


# Sensors: Force Sensing Resistor (FSR)

</examples/sensors/fsr.html>

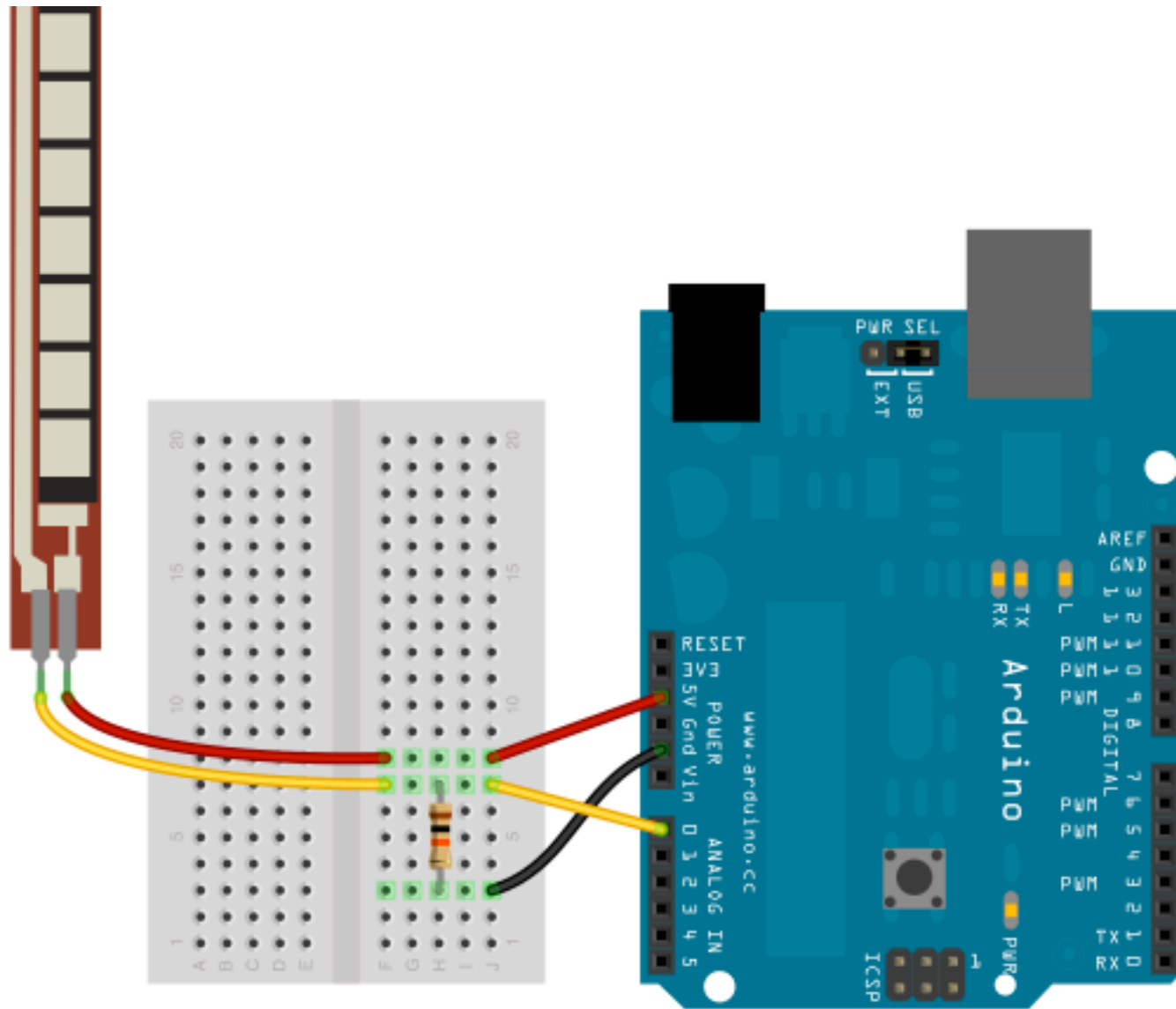
## Component List

- FSR
- 10k resistor



# Sensors: Flex Sensor

</examples/sensors/flex.html>



## Component List

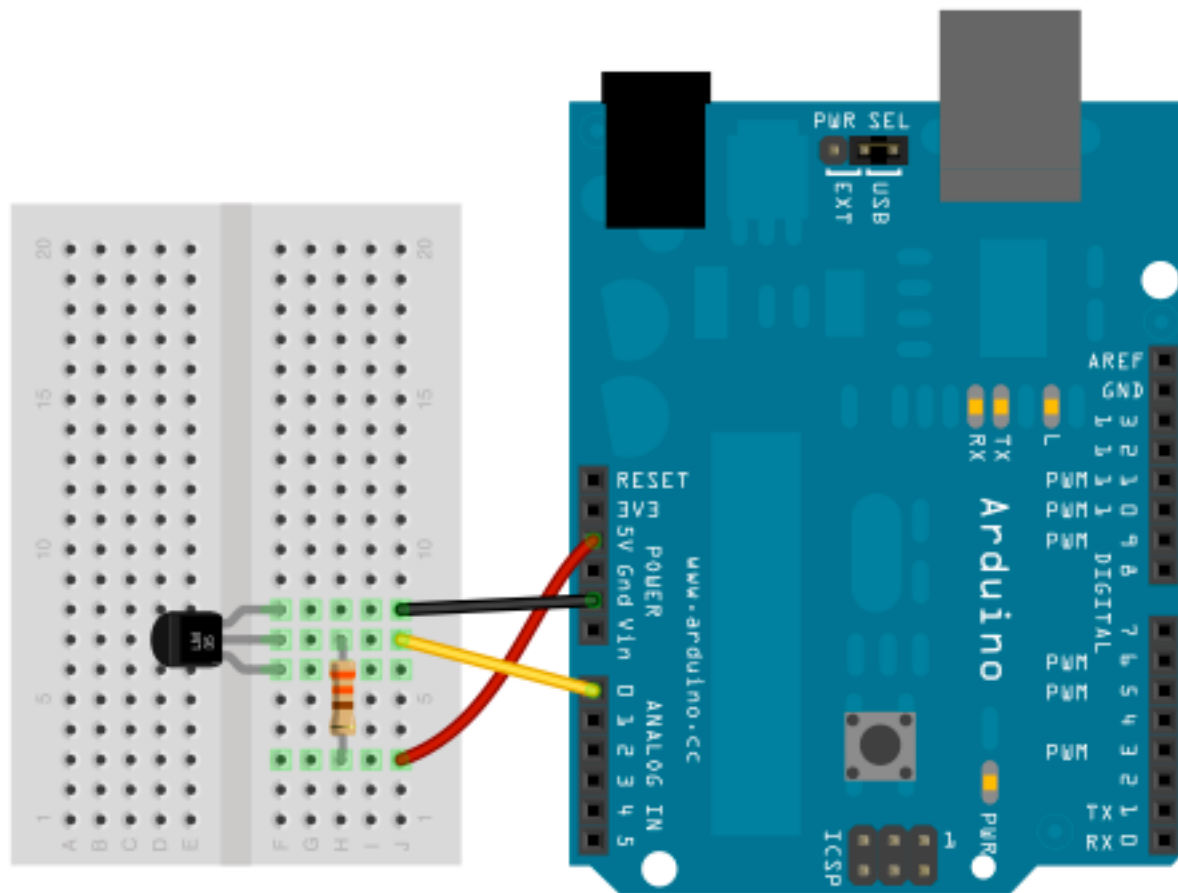
- Flex sensor
- 10k resistor

# Sensors: Temperature Sensor

</examples/sensors/temperature.html>

## Component List

- LM335 temp sensor
- 330 ohm resistor

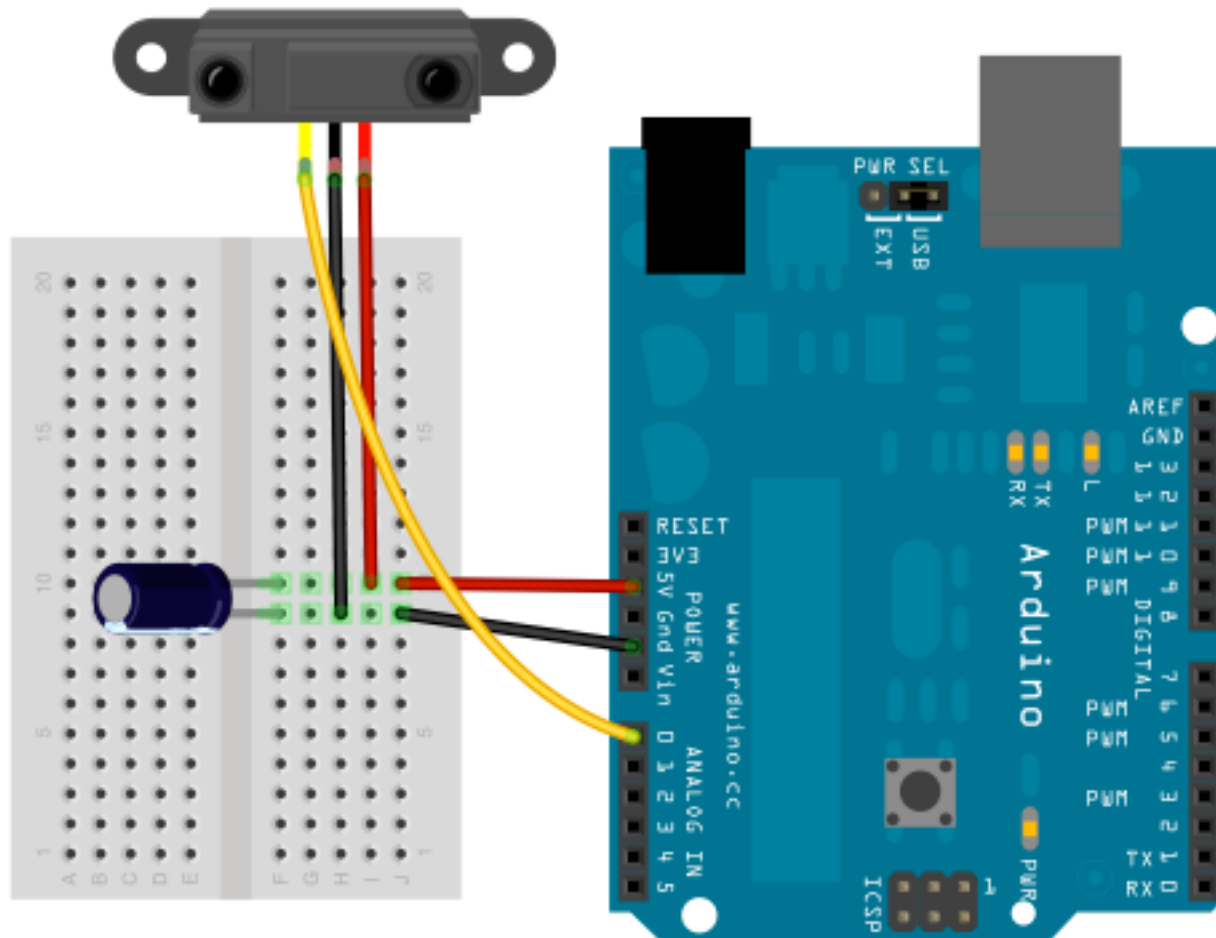


# Sensors: Sharp IR Proximity Sensor

[/examples/sensors/sharp\\_ir.html](/examples/sensors/sharp_ir.html)

## Component List

- Sharp IR proximity sensor
- 10uF capacitor



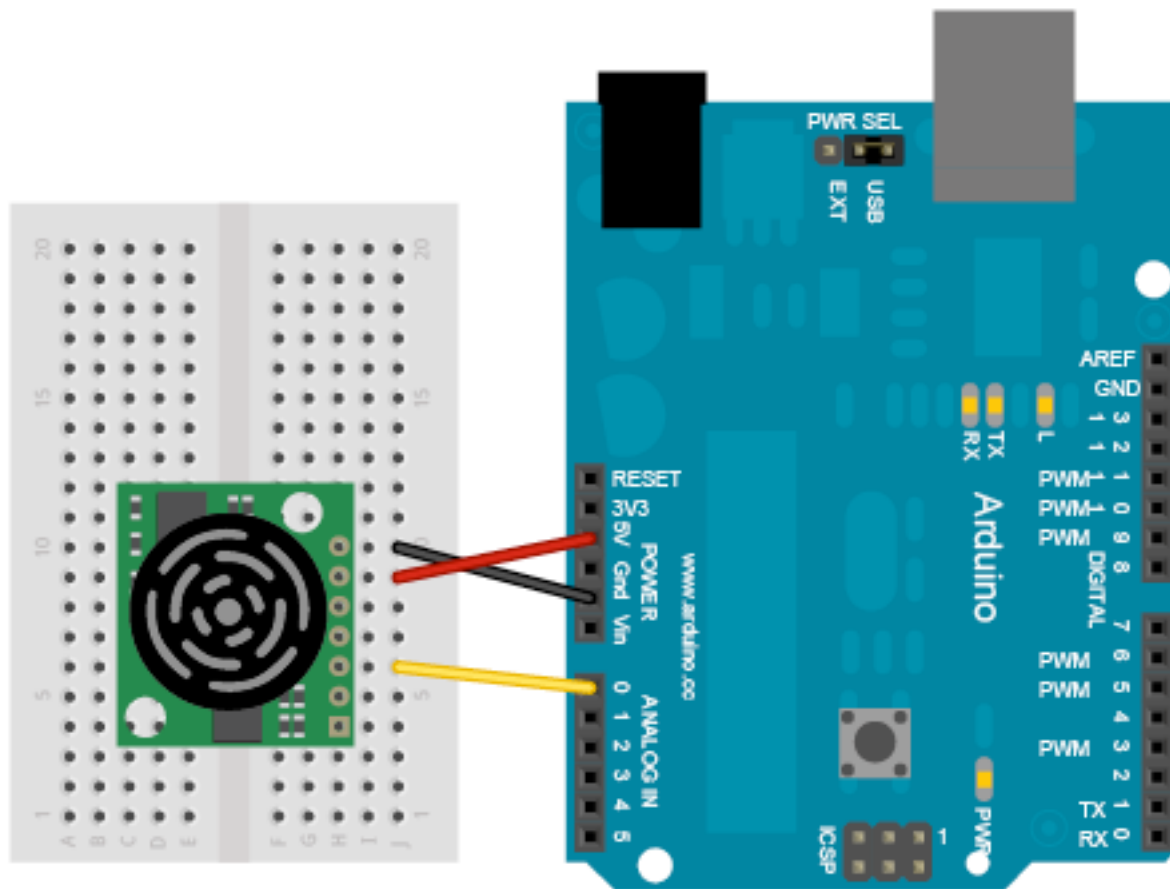


# Sensors: Sonar Sensor

</examples/sensors/sonar.html>

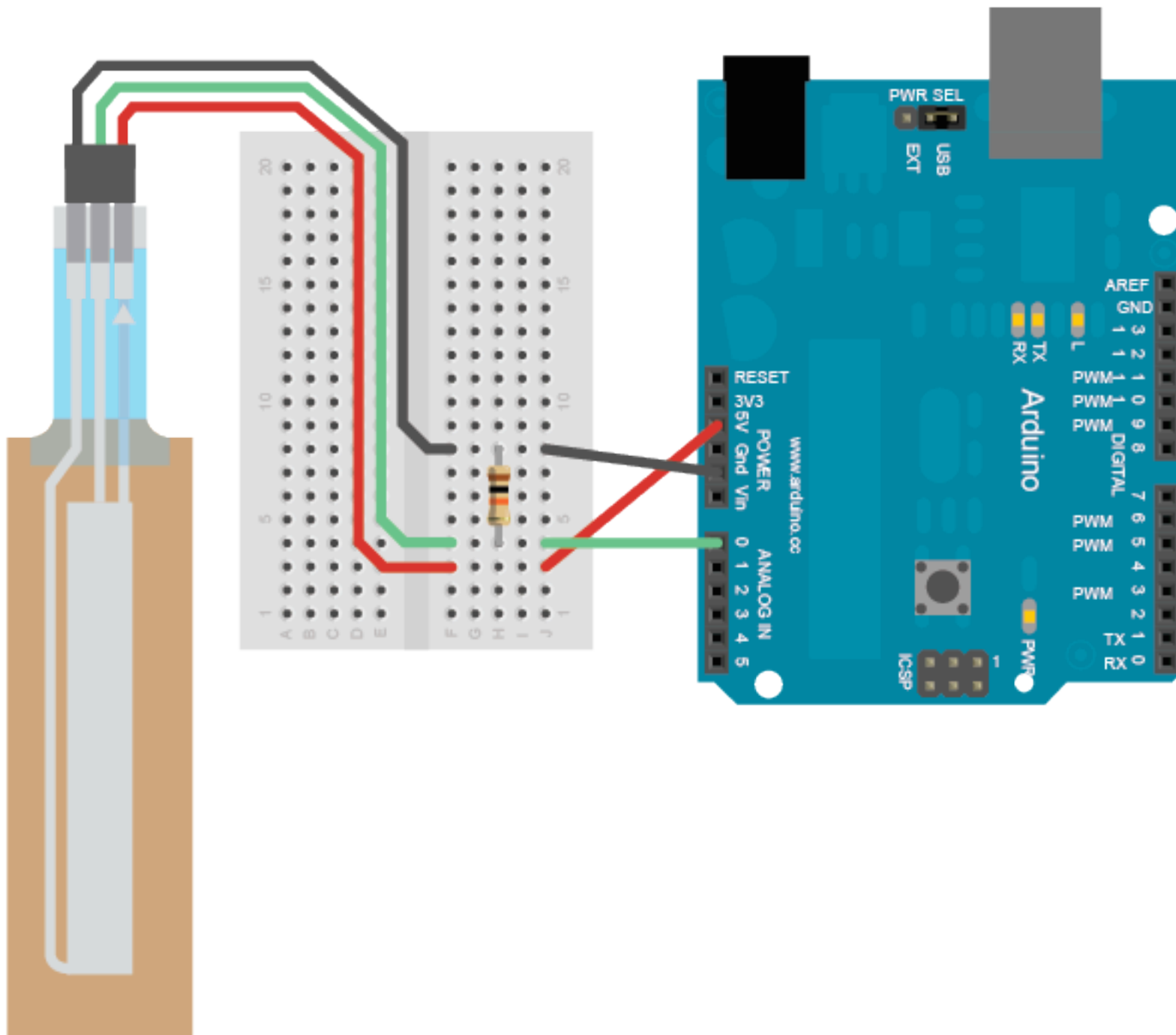
## Component List

- LV-MaxSonar-EZ1



# Sensors: Softpot

</examples/sensors/softpot.html>



## Component List

- Softpot
- 10k resistor

# Sensors: Analog Accelerometer

[/examples/sensors/analog\\_accelerometer.html](/examples/sensors/analog_accelerometer.html)

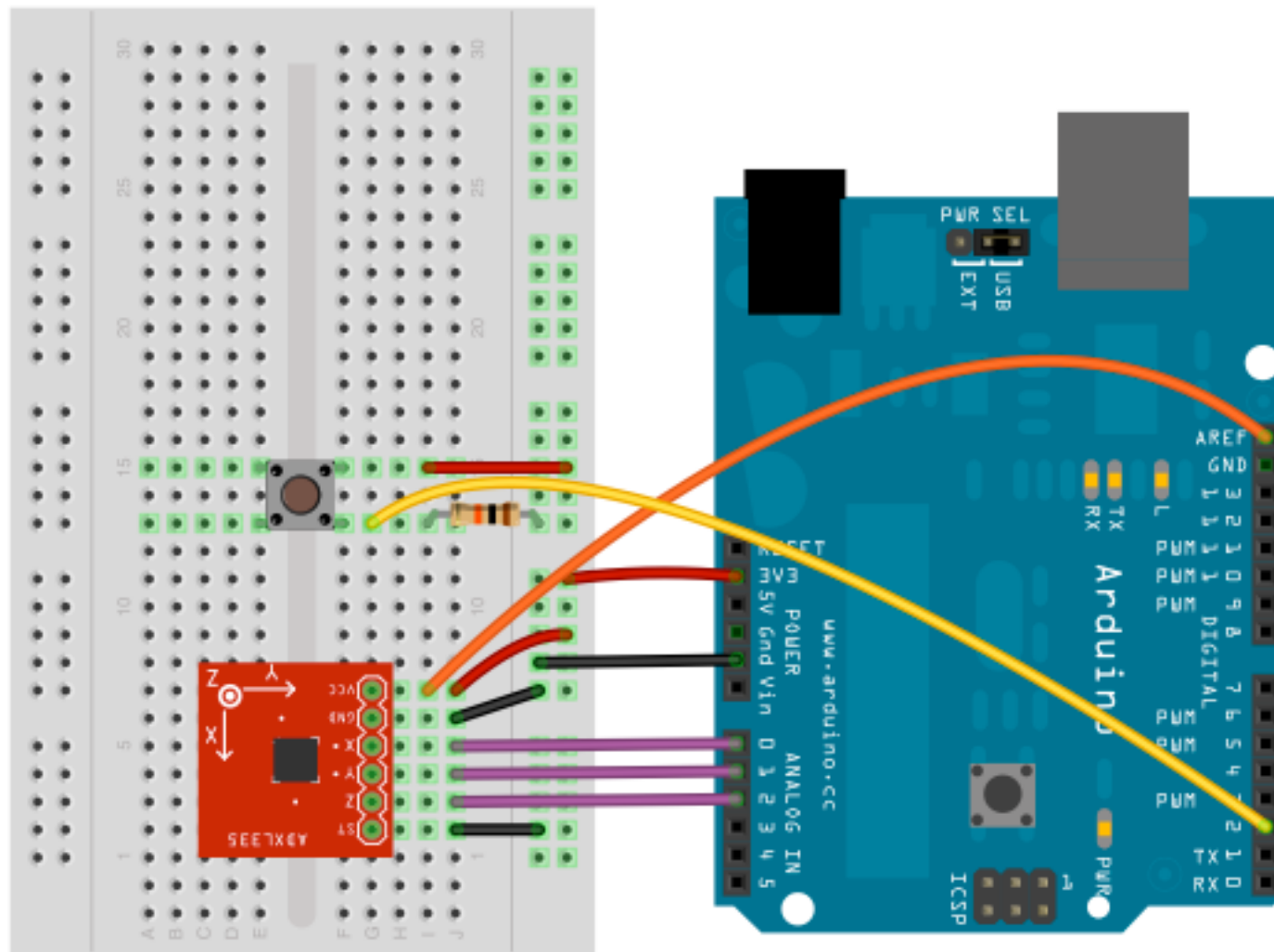
[/examples/sensors/calibrate\\_accelerometer.html](/examples/sensors/calibrate_accelerometer.html)

[/examples/three\\_js/accelerometer.html](/examples/three_js/accelerometer.html)

[/examples/processing\\_js/accelerometer.html](/examples/processing_js/accelerometer.html)

## Component List

- ADXL335 (or 330)
- Button
- 10k resistor



The analog accelerometer examples should work for any analog accelerometer. The ADXL335 just happens to be the accelerometer used for this schematic.

# Sensors: HMC6352 Compass

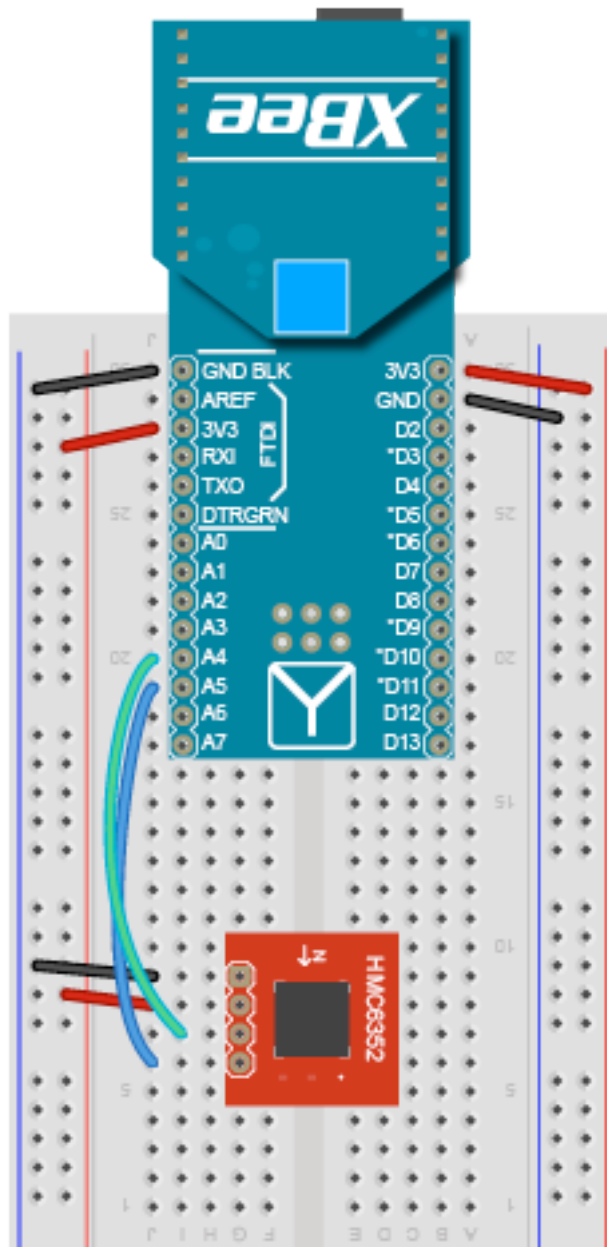
</examples/sensors/hmc6352.html>

[/examples/processing\\_js/compass.html](/examples/processing_js/compass.html)

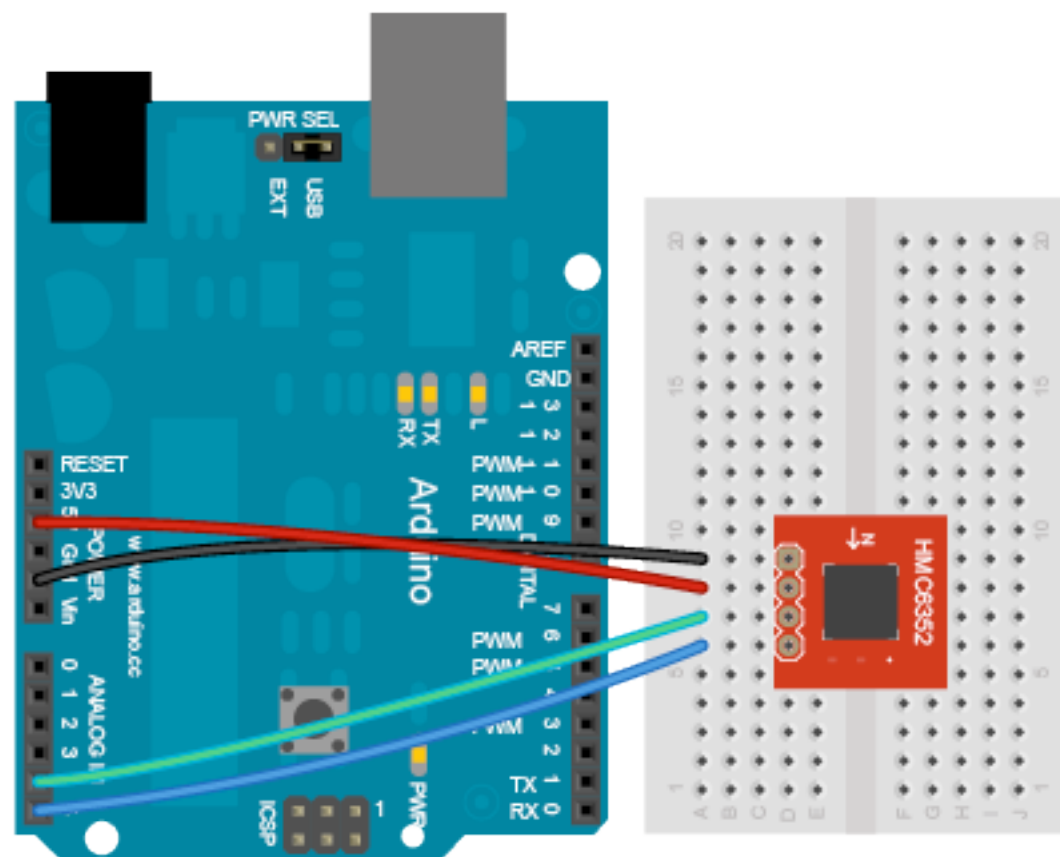
## Component List

- HMC6352 compass
- Arduino FIO, Uno or other I/O board

Unlike the other I2C sensors in this document, the HMC6352 is 5v tolerant so you can use it with any I/O board.



Arduino FIO with XBee wireless connection



Arduino Uno or other board

# Sensors: HMC5883 3-axis Magnetometer

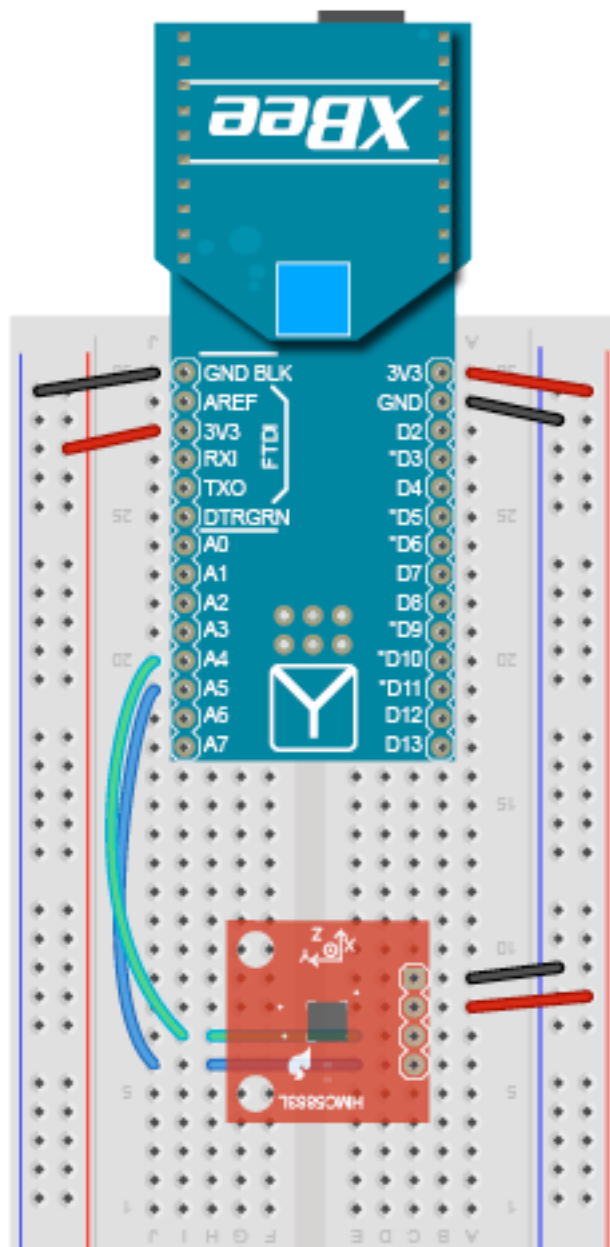
</examples/sensors/hmc5883.html>

## Component List

- HMC5883 magnetometer
- Arduino FIO,  
or Pro Mini (3.3v),  
or other 3.3v I/O board

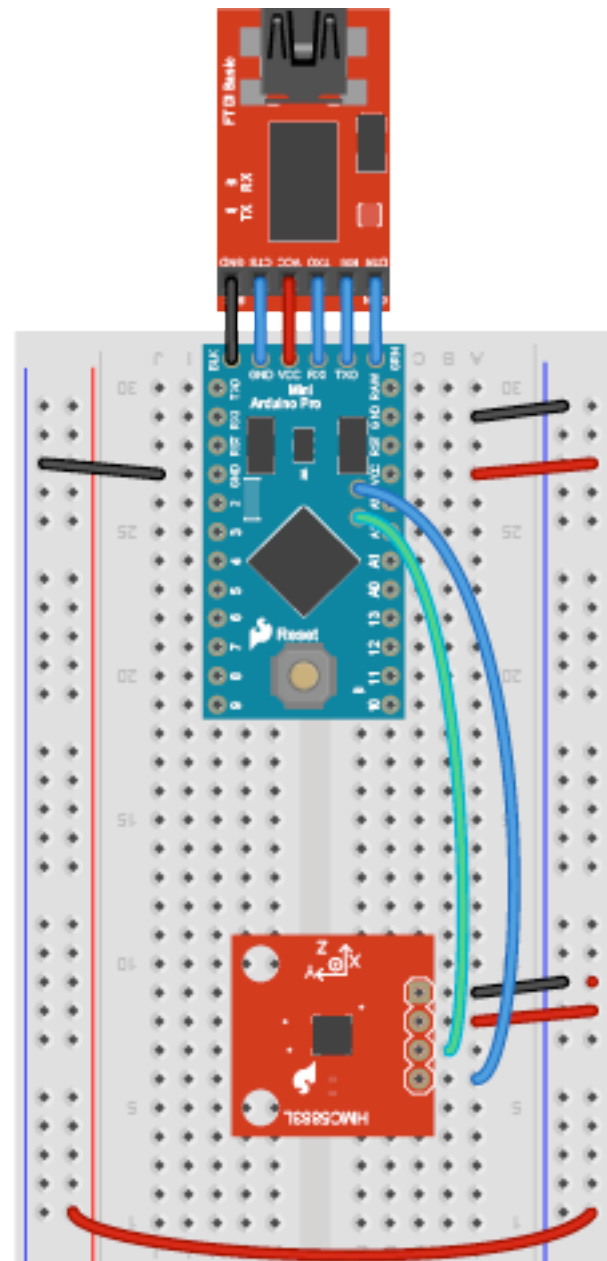
You must use this sensor with a 3.3v or lower I/O board or use a logic level converter if using an I/O board at a higher voltage.

See Appendix A for an example of wiring a low voltage I2C sensor to a 5v I/O board.



Arduino FIO with Xbee  
wireless connection

- OR -



Arduino Pro Mini 3.3v with  
FTDI Basic Breakout 3.3v

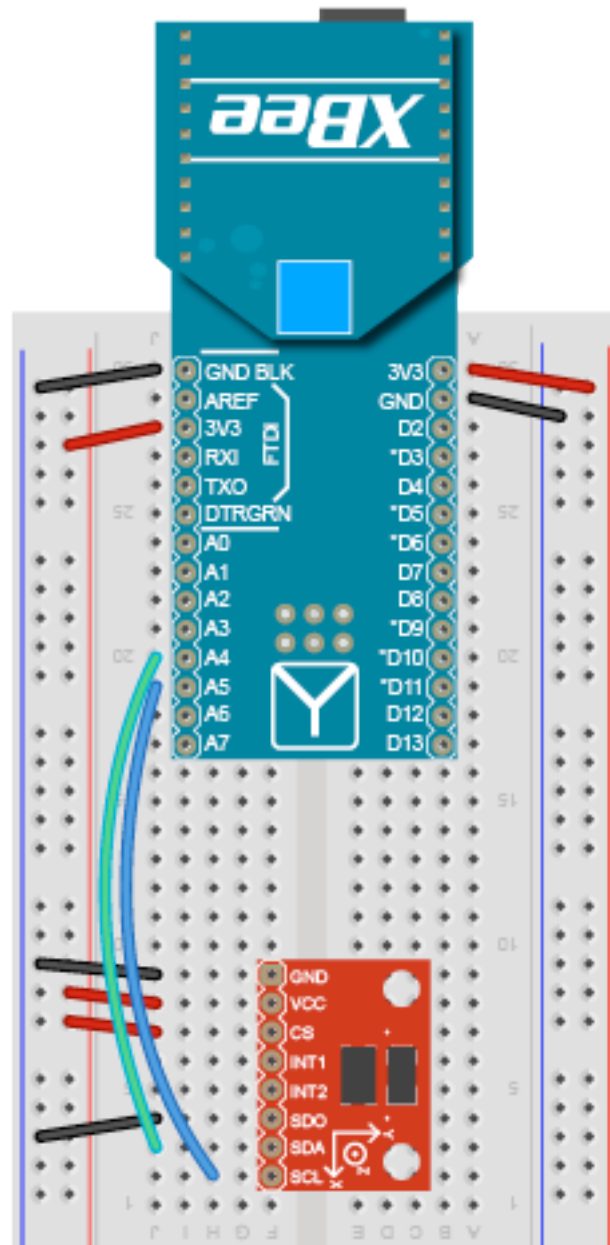


# Sensors: ADXL345 3-axis Accelerometer

</examples/sensors/adxl345.html>

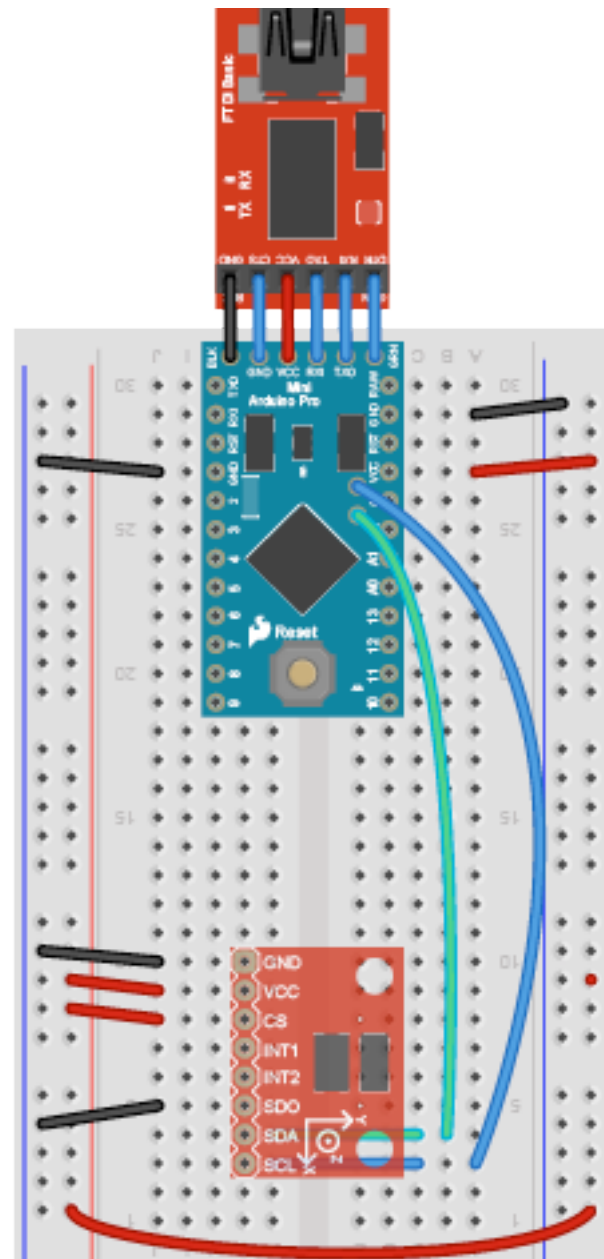
## Component List

- ADXL345 accelerometer
- Arduino FIO,  
or Pro Mini (3.3v),  
or other 3.3v I/O board



Arduino FIO with Xbee  
wireless connection

- OR -



Arduino Pro Mini 3.3v with  
FTDI Basic Breakout 3.3v

You must use this sensor with a 3.3v or lower I/O board or use a logic level converter if using an I/O board at a higher voltage.

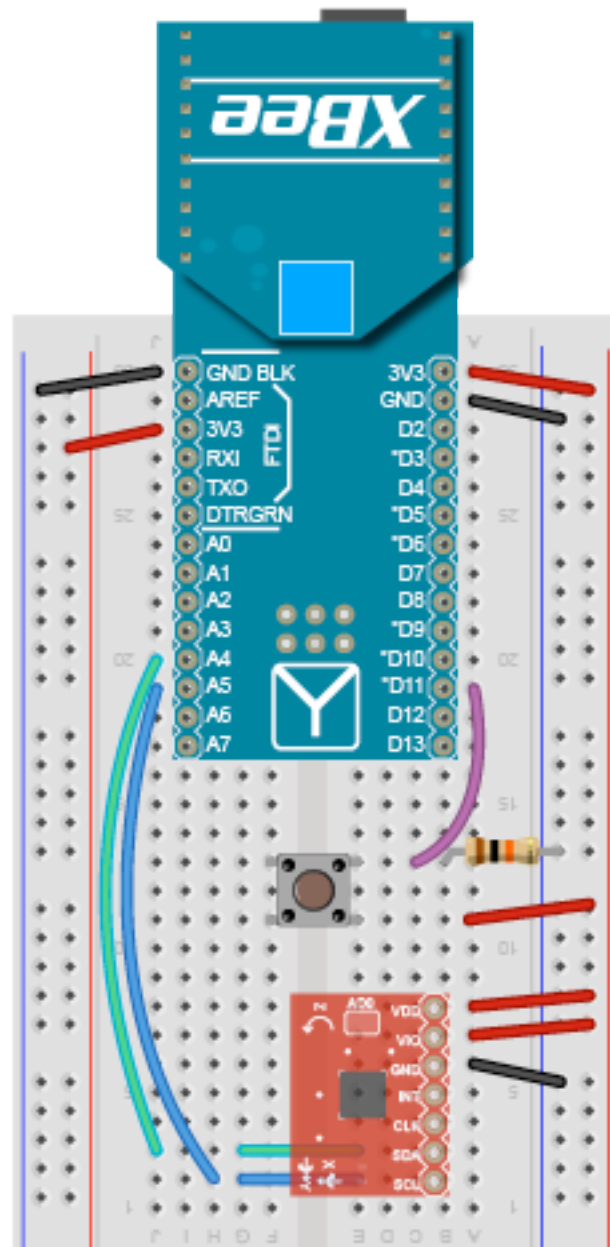
See Appendix A for an example of wiring a low voltage I2C sensor to a 5v I/O board.



# Sensors: ITG3200 3-axis Gyroscope

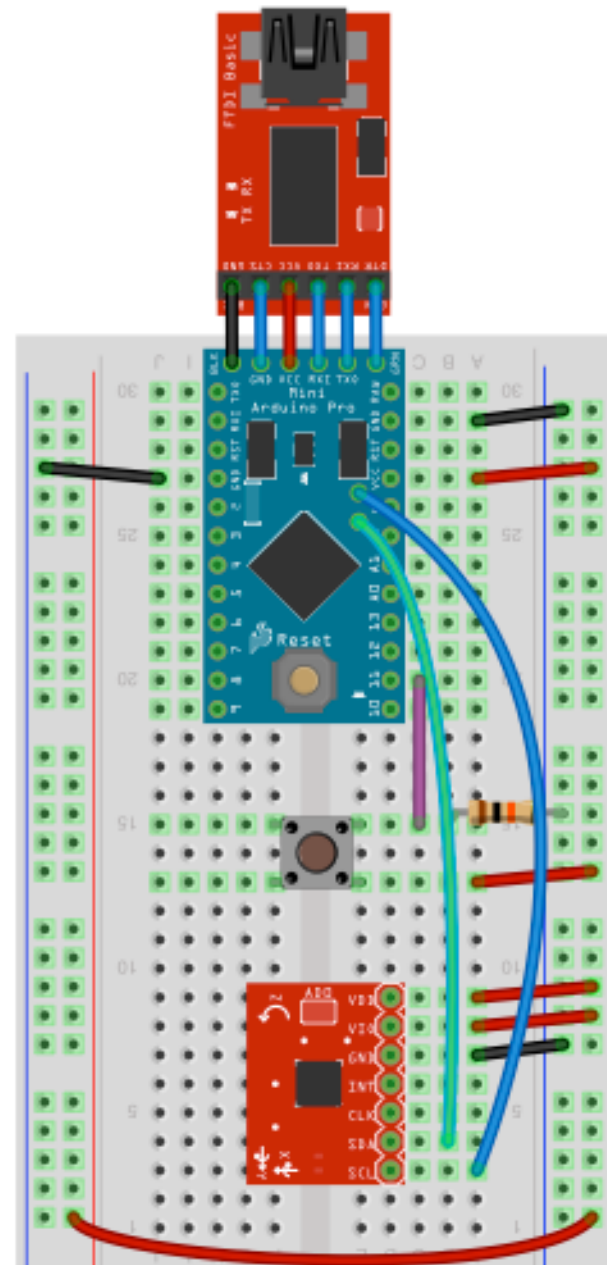
</examples/sensors/itg3200.html>

[/examples/processing\\_js/gyro.html](/examples/processing_js/gyro.html)



Arduino FIO with XBee  
wireless connection

- OR -



Arduino Pro Mini 3.3v with  
FTDI Basic Breakout 3.3v

## Component List

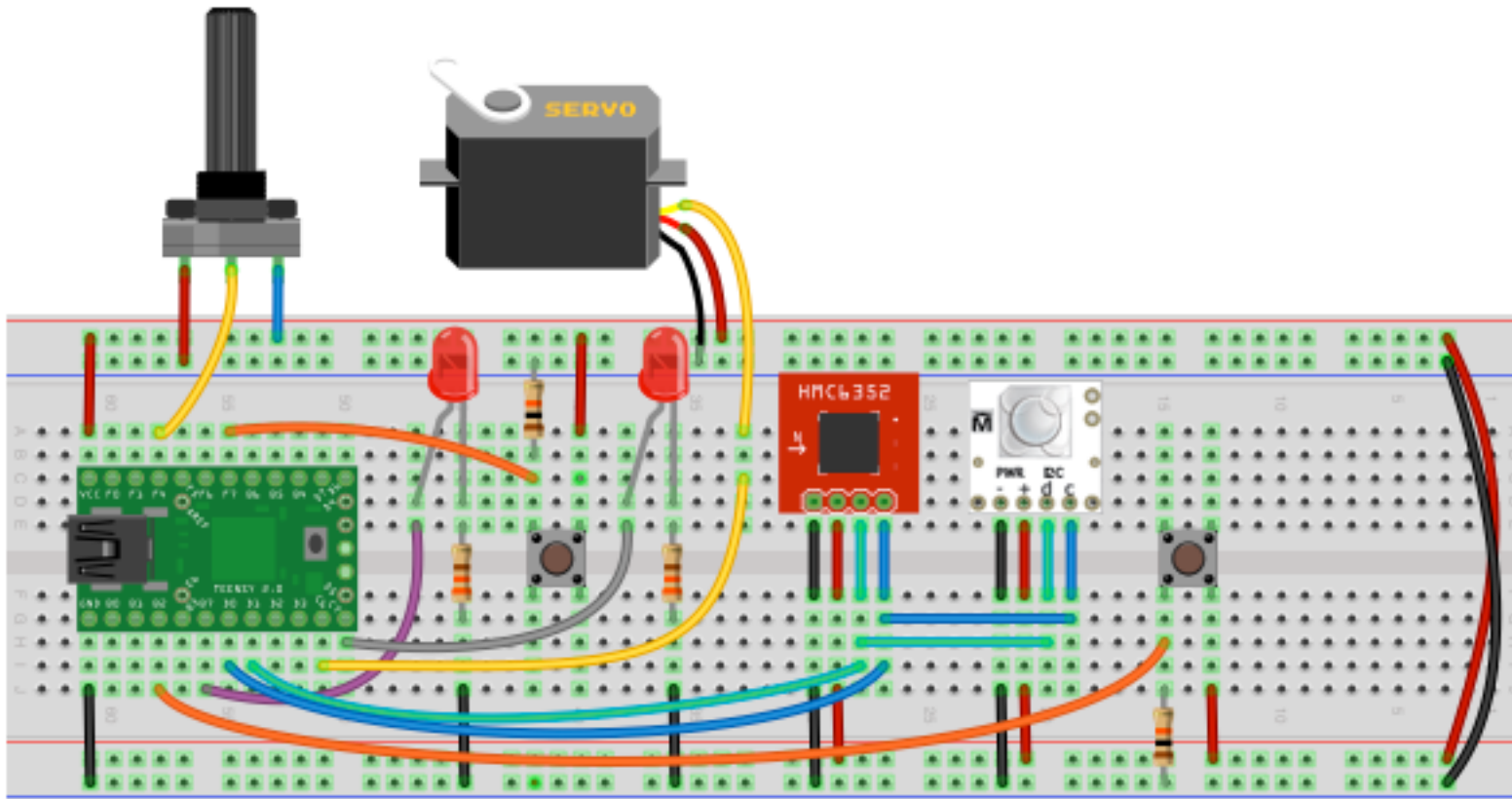
- ITG3200 gyro
- Button
- 10k resistor
- Arduino FIO,  
or Pro Mini (3.3v),  
or other 3.3v I/O board

You must use this sensor with a 3.3v or lower I/O board or use a logic level converter if using an I/O board at a higher voltage.

See Appendix A for an example of wiring a low voltage I2C sensor to a 5v I/O board.

# Boards: Teensy 2.0

</examples/boards/teensy.html>



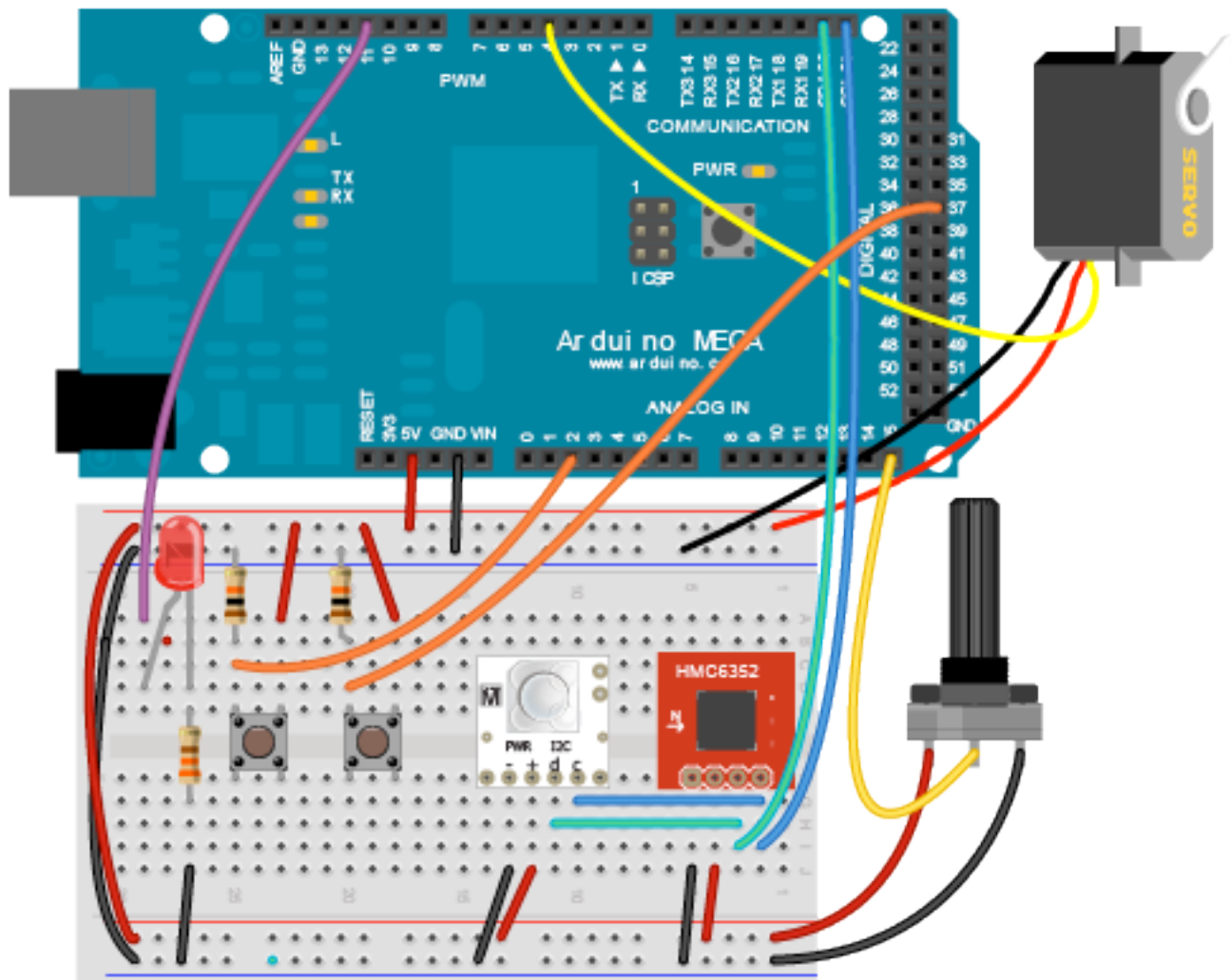
This schematic is used to test the Teensy 2.0 board with Breakout. The teensy.html example can be used even if you do not have all of these components.

## Component List

- Teensy 2.0
- 2 Buttons
- 2 10k resistors
- 2 Leds
- 2 330 ohm resistors
- Potentiometer
- Servo
- HMC6352 Compass
- BlinkM Led Module

# Boards: Arduino Mega

</examples/boards/mega.html>



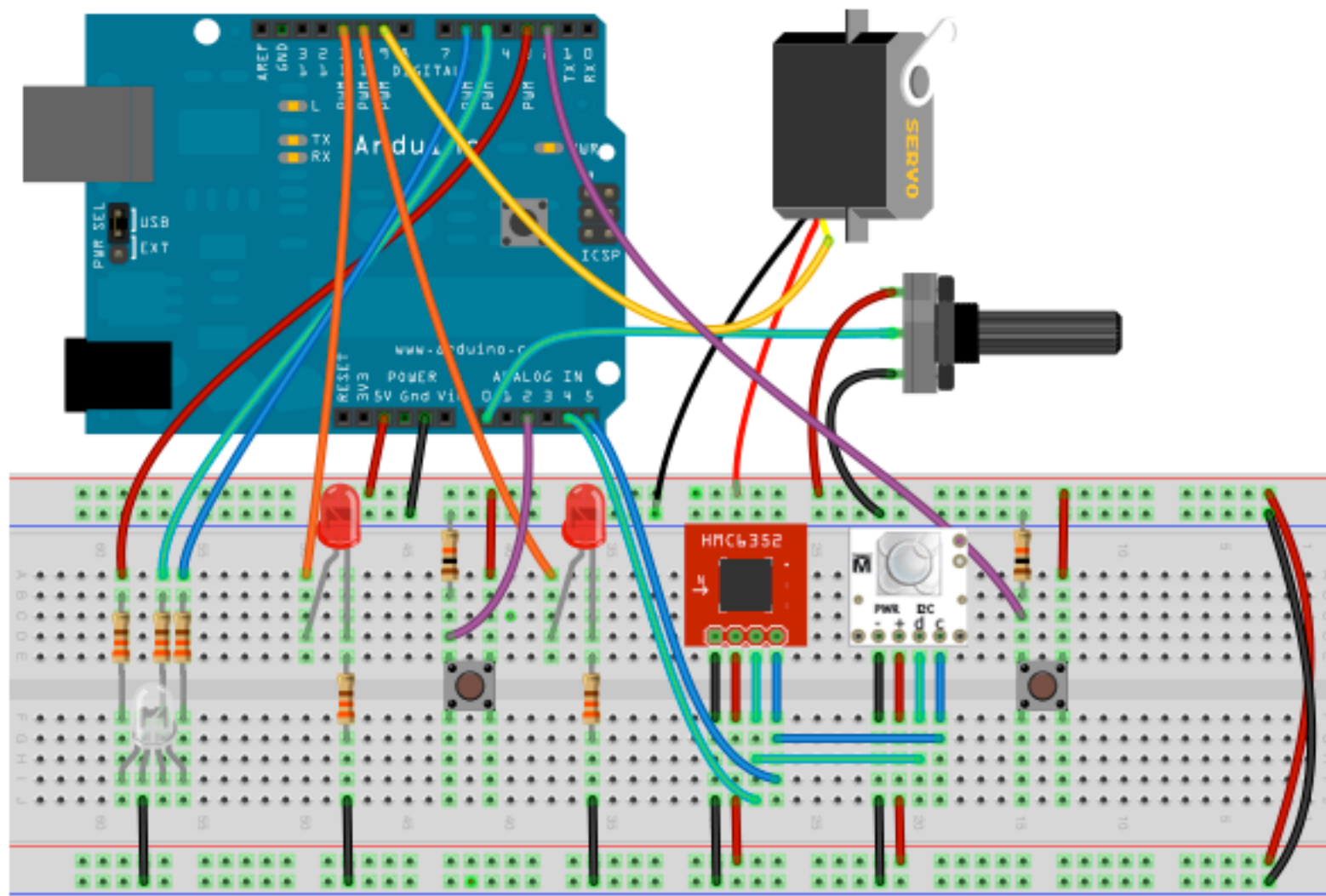
## Component List

- Arduino Mega
- 2 Buttons
- 2 10k resistors
- 1 Led
- 1 330 ohm resistors
- Potentiometer
- Servo
- HMC6352 Compass
- BlinkM Led Module

This schematic is used to test the Arduino Mega board with Breakout. The mega.html example can be used even if you do not have all of these components.

# Boards: Arduino Uno

</examples/boards/uno.html>



## Component List

- Arduino Uno (or other similar)
- 2 Buttons
- 2 10k resistors
- 2 Leds
- 1 RGB Led
- 5 330 ohm resistors
- Potentiometer
- Servo
- HMC6352 Compass
- BlinkM Led Module

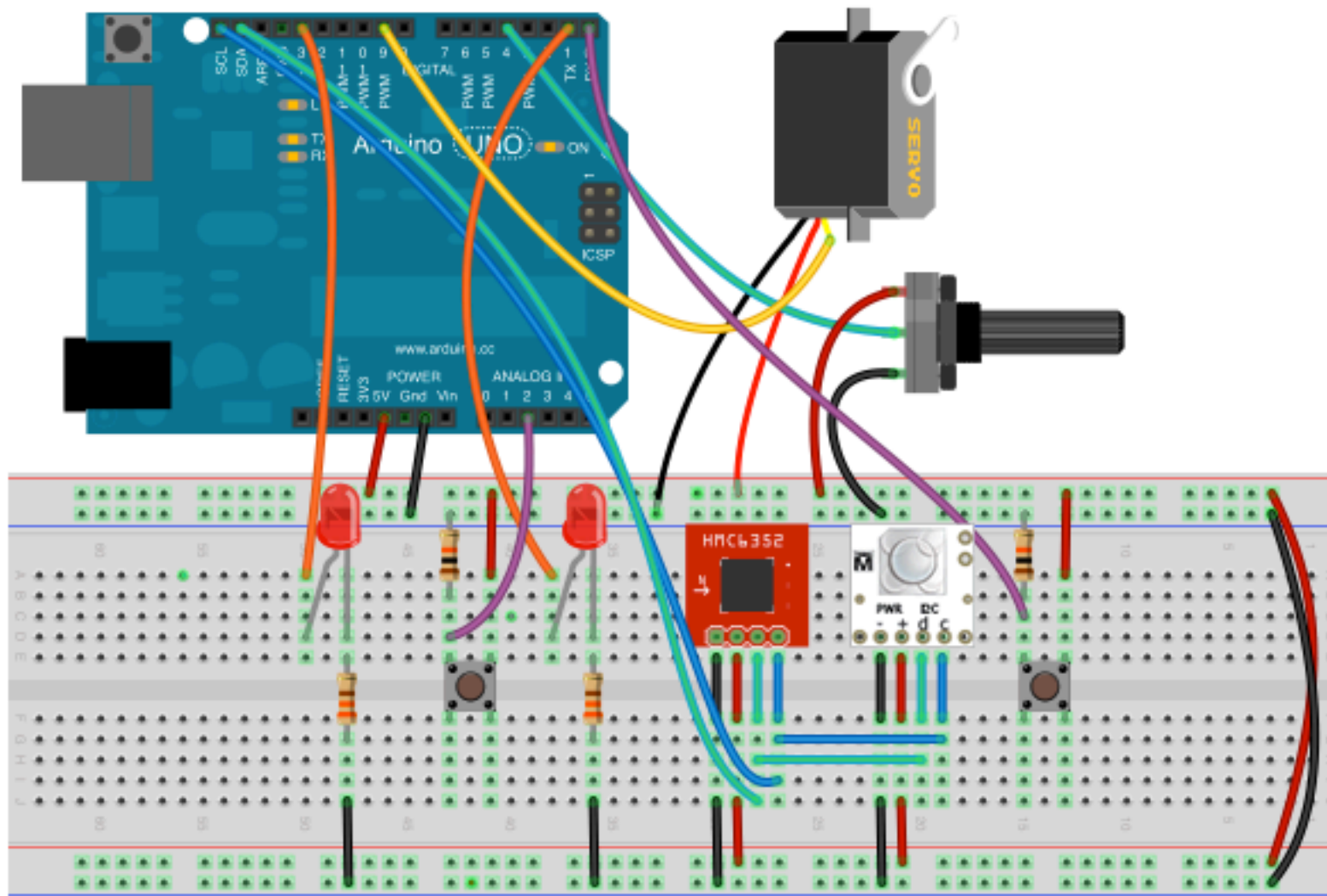
This schematic is used to test the Arduino Uno (or similar) board with Breakout. The uno.html example can be used even if you do not have all of these components.



# Boards: Arduino Leonardo

</examples/boards/leonardo.html>

Please note: An Arduino Uno R3 is pictured below because the Leonardo board has not yet been added to Fritzing. However the pinout on the Leonardo board is the same as in the illustration below.



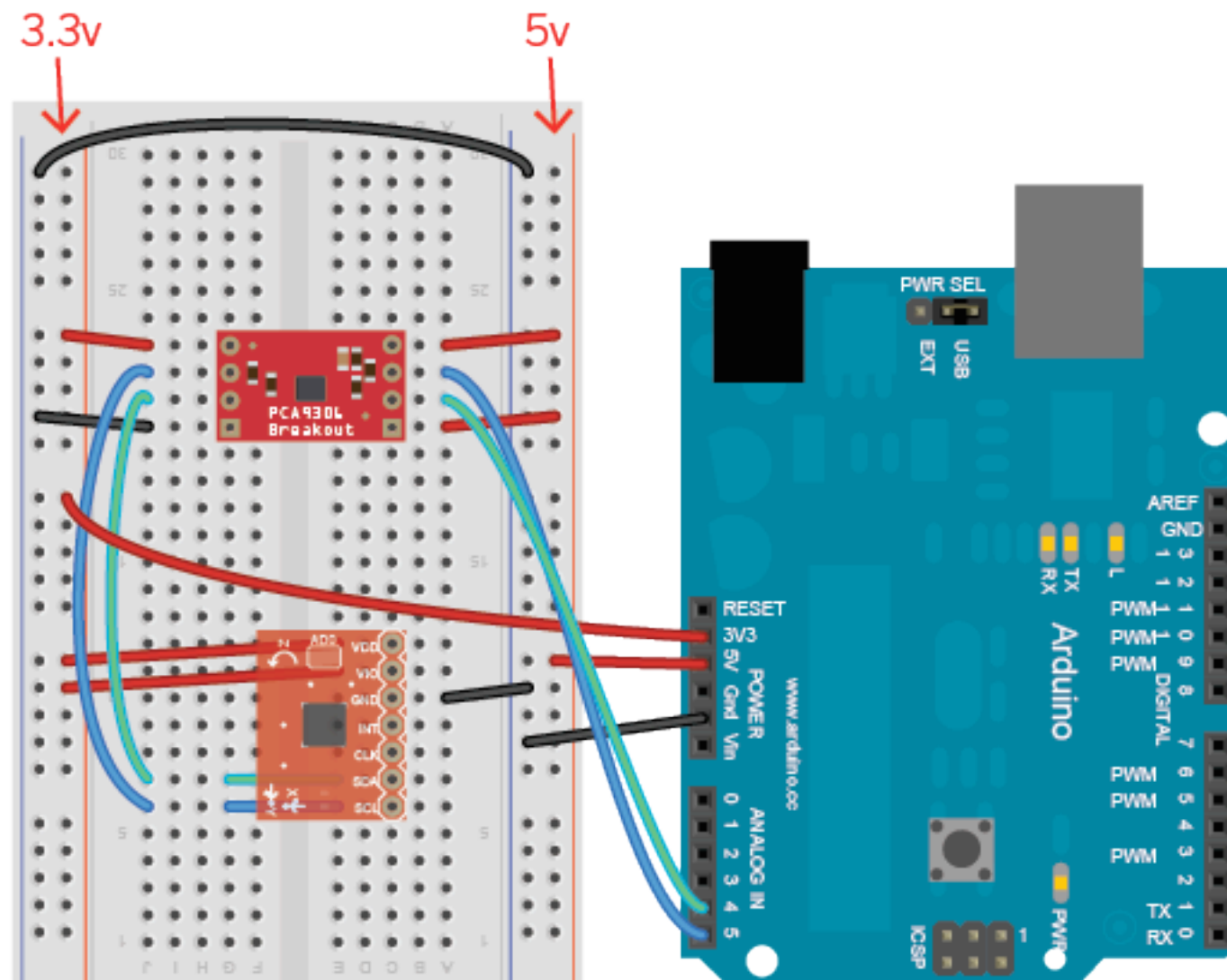
## Component List

- Arduino Leonardo
- 2 Buttons
- 2 10k resistors
- 2 Leds
- 2 330 ohm resistors
- Potentiometer
- Servo
- HMC6352 Compass
- BlinkM Led Module

This schematic is used to test the Arduino Leonardo board with Breakout. The leonardo.html example can be used even if you do not have all of these components.

# Appendix A: Using 3.3v I2C Sensors with a 5v I/O board

Although the itg3200 gyro is featured in this schematic, it applies to any I2C sensors that require 3.3v or less.



## Component List

- ITG3200 gyro (or other I2C sensor)
- Arduino
- PCA9306 level translator breakout board

You can also connect multiple I2C sensors to the same translator board all sensors share the I2C bus (SCL and SDA)