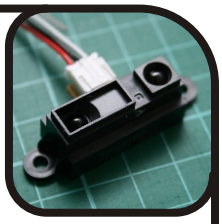
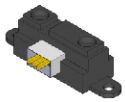
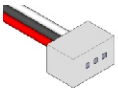
Sensing Distance (SHARP GP2Y0A21YK)



The Pieces

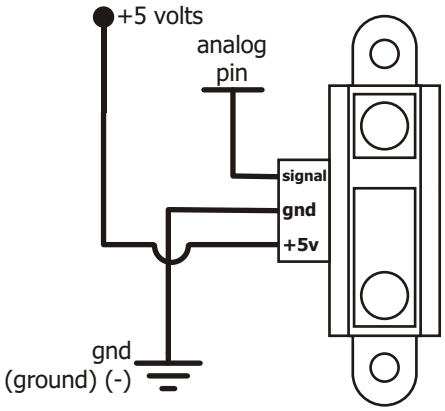


IR Distance Sensor
(Sharp GP2Y0A21Y)
x1



Cable
(JST 3 pole)
x1

The Schematic



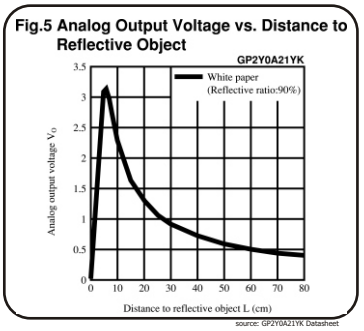
The Theory & Code

Infra Red Distance Sensor

An analog IR distance sensor is a really neat component. Simply connect +5v and ground and a voltage proportional to the distance between the sensor and an object in front of it will be returned (ranging from 0.4 volts at 80 cm to 3 volts at 10 cm). It really couldn't be simpler to use.

Converting to Distance

The voltage returned is not linear (see graph), however it can be converted to a distance using some simple maths. There will be some variation between models but here are a couple of equations that worked for us (results +-~5%)



Equations

From 10 bit A/D Reading to centimeters (5v supply)

distance = 12343.85 * (**10bit reading**)^-1.15

From Voltage Reading to Centimeters

distance = 27.86 (**voltage reading**)^-1.15

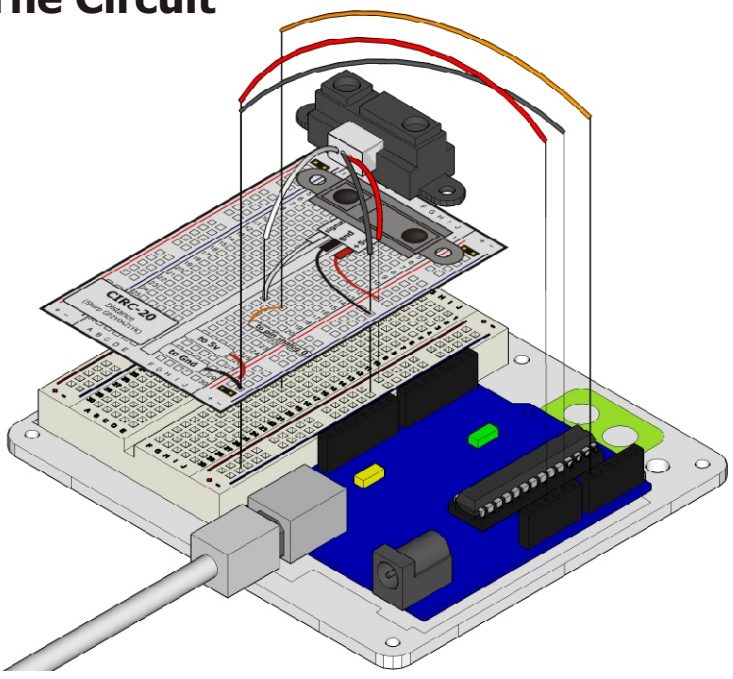
Arduino Code (5v)

float **distance** = 12343.85 * pow(analogRead(**sensorPin**),-1.15)

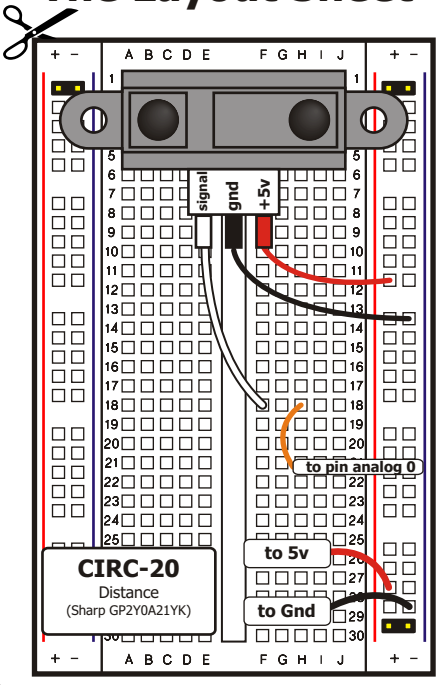
Technical Details

.: Full Datasheet: http://tinyurl.com/**yh7chku :.**

The Circuit



The Layout Sheet



.: **Instructions:** print out, cut out, get making :.
.: for more details visit: http://tinyurl.com/**y9bjsjp** :.