Real Time Pressure Sensor

Why do this?

Adding a pressure sensor will tell your Arduino how deep your glider is. You can do two things with this information:

1. Control your glider by making decisions based on depth

2. Save the depth to an SD card along with other sensor information so you could, for example, see temperature vs depth profiles.

Parts list

1)   Pressure sensor (MPXHZ6250AC6T1CT-ND)
2)   Pressure sensor breakout board (8-SSOP breakout board)
3)   Loctite Marine epoxy to seal interface
4)   26 awg Wire (rainbow wire in kit)

Schematic

Most of this schematic is for reference purposes. The only additional pieces for this module is the green pressure sensor down in the bottom right corner.
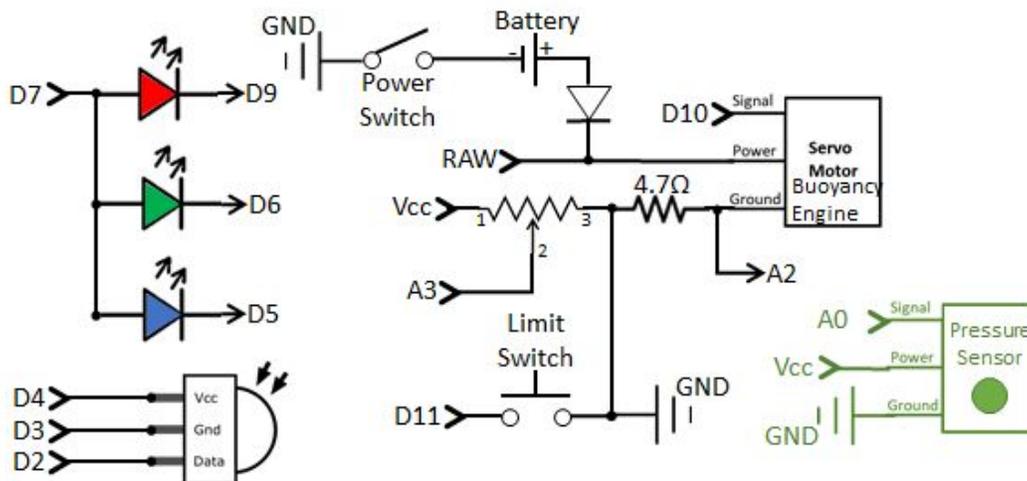
Code example

Here are some key commands you can use.

```
static byte pressureSensorPin = A0;     // set up static reference for the pin number

// in the code, when you want to read depth
int sValue = analogRead(pressureSensorPin); // reads pressure sensor voltage as 0-1023
double pressure = (double(sValue) / 1024.0 + 0.04) / 0.004; // convert A2D counts to kilopascals
double depth = pressure * (33.455 / 100.0);                 // convert kPa to feet of fresh water
```
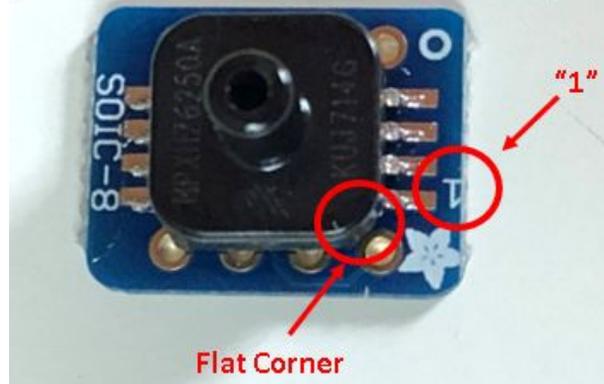
Assembly

1. Orient the pressure sensor and the breakout board correctly

Look for the "1" on the blue breakout board. The flat corner is going to line up with this "1"

"1"

Find the corner of the pressure sensor that is slightly flatter than the others (look closely!)

Flat Corner

2. Solder the pressure sensor onto the breakout board

Solder Tip: Melt a small amount of solder onto each of the 8 pins of the pressure sensor first. Set the pressure sensor on the breakout board in the correct orientation (double check!). Touch each of the pins to re-melt the solder, securing the pressure sensor in place. Add more solder if necessary.

3. Solder 3 wires into the breakout board FROM THE BOTTOM

Flat Corner of Pressure Sensor

Leave Open

5V

Ground
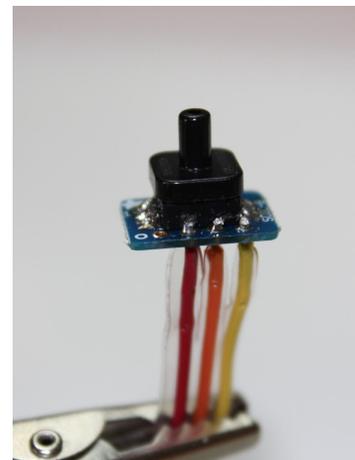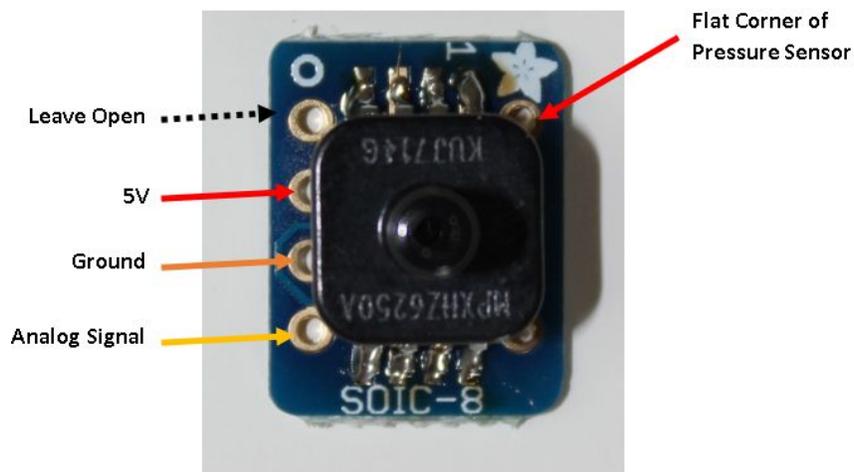
Analog Signal

4.   Solder wires onto the circuit board:

5V (red) will go to any open hole on the row along the edge of the board

Ground (Orange) will go to any open hole along the second row

Analog Signal (Yellow) will go to any hole attached to an Analog Pin on the Arduino
   (here we use A0)
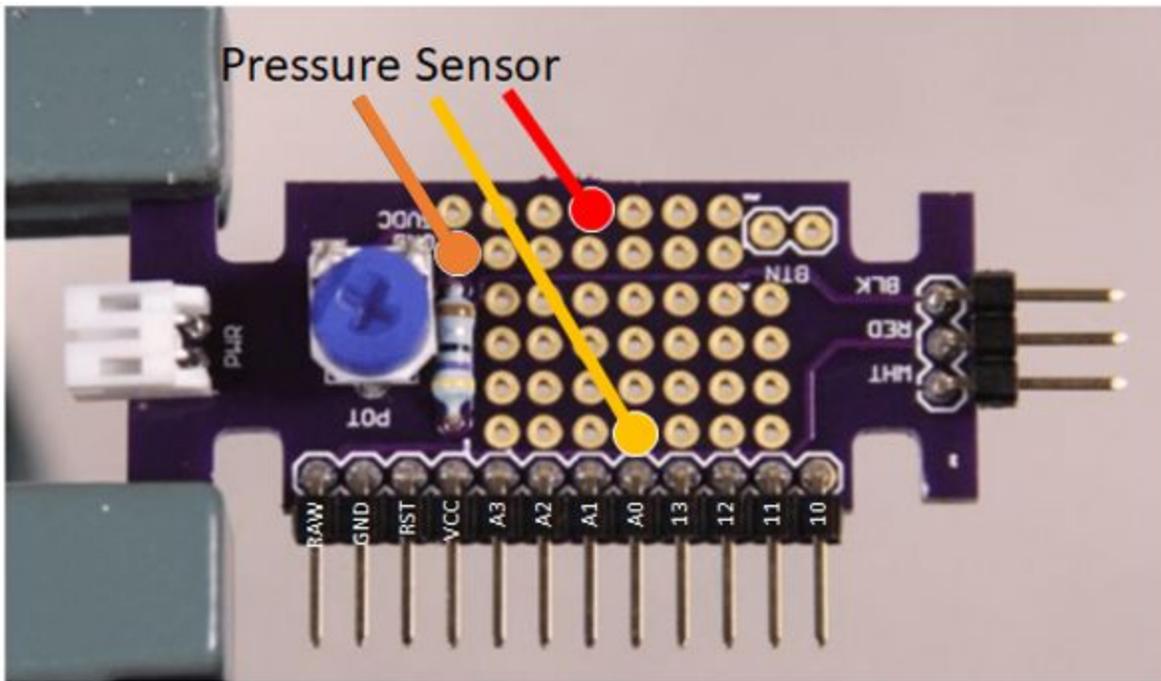
5. Test the pressure sensor. Before you epoxy anything permanently, use the code example above to make sure everything is hooked up correctly.

6. Prepare for Epoxy

Drill a ⅛" hole in the center of one of the recess (on either side of the cap) and cover the threads of the cap with tape to protect from epoxy.

Carefully place a small piece of wire or tape into the pressure sensor hole to keep epoxy from entering the sensor. Be gentle to avoid damaging the sensor inside!
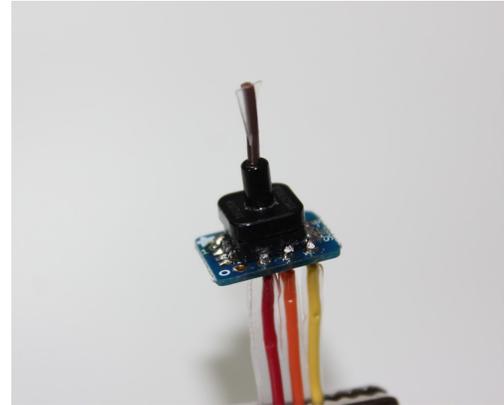
7. Epoxy sensor into place
VERY THOROUGHLY mix 2-part marine epoxy. Then completely cover the base of the sensor, breakout board, and wire connections.

Apply epoxy to the inside of the cap around the hole. DO NOT GET EPOXY IN THE THREADS or your bottle will leak. You can use a small piece of wire to open the hole in the epoxy where the sensor is going poke through. Set the sensor snuggly into place and use a piece of tape to hold it together while the epoxy dries overnight.

8. After the epoxy has cured, re-assemble your glider and test it out!