PARALLAX

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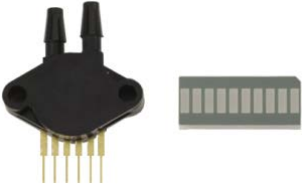Sales: (888) 512-1024
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Freescale MPX 5020 Pressure Sensor Spin Demo

Please Note: These products are not sold by Parallax. This demo was created to support the 2013 National microMedic Contest kits, which are no longer available.

The Freescale sensor allows your project to take pressure measurements, and returns its readings as an analog voltage. Thus, to properly "read" the pressure from the sensor, you will need to make use of the Propeller Board of Education's onboard ADC (Analog to Digital Converter) and do some math to relate a voltage reading directly with a pressure in your desired unit of pressure. This Spin-language demo reports the raw ADC readings to the Parallax Serial Terminal and uses the LED bar graph as a relative pressure indicator.

The Freescale MPX 5010 Pressure Sensor works by measuring the deflection of a diaphragm inside the sensor's plastic housing. The sensor's hose barbs connect on either side of the sensing diaphragm, allowing the sensor to take differential readings. If you leave one hose barb open to the ambient atmosphere, you can measure positive or negative pressure with respect to the atmospheric pressure; or you can connect a hose to both barbs and measure the difference in pressure between the two hoses - the choice is yours!
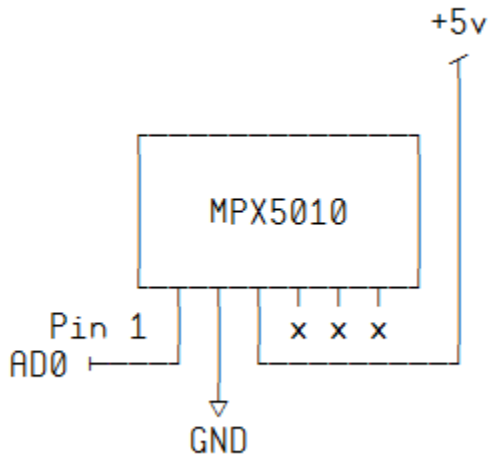
Demo Part Requirements

(1) Propeller Board of Education
(1) MPX5010 Pressure Sensor
(1) 10-segment LED bar graph
(10) 220 Ohm Resistors
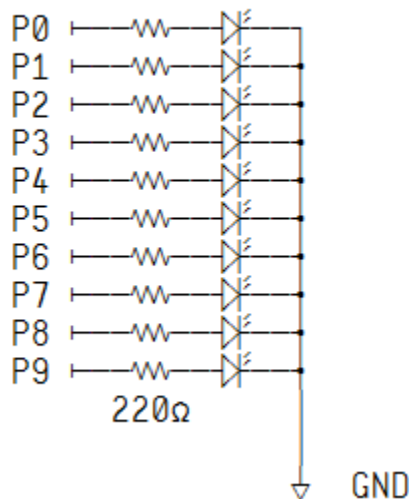(15) Jumper Wires

Connections

The connection diagram below shows how to connect the Propeller Board of Education's I/O pins to the LED bar graph. The connection diagram also shows you how to connect the pressure sensor to the Propeller Propeller Board of Education's ADC input and power rails. The diagram can also be found in the source code file "Pressure Sensor and BarGraph DEMO.spin". Pin 1 on

the pressure sensor has a small notch cut out of the edge pin. Use this indictator when wiring the pressure sensor to the Propeller BOE.

```
=== Pressure Sensor Pin Connections ===

                                    +5v
                                     |
                                     |
            ┌──────────────────┐
            │                  │
            │     MPX5010      │
            │                  │
            └──────────────────┘
       Pin 1 │   │   │ x x x │
        AD0 ┤───┘   │   └─────────┘
                    ▽
                   GND
```

```
=== LED Bar Graph Pin Connections ===

   P0 ├───W───▷├─┐
   P1 ├───W───▷├─┤
   P2 ├───W───▷├─┤
   P3 ├───W───▷├─┤
   P4 ├───W───▷├─┤
   P5 ├───W───▷├─┤
   P6 ├───W───▷├─┤
   P7 ├───W───▷├─┤
   P8 ├───W───▷├─┤
   P9 ├───W───▷├─┤
        220Ω
                 ▽  GND
```

Programming

Once you have correctly wired the pressure sensor and LED bar graph, download the demonstration program to the Propeller Board of Education. To do this, open the "Pressure Sensor and BarGraph DEMO.spin" source code file with the Propeller Tool. To download the program, click Run>>Compile Current>>Load RAM, or press the F10 key on your keyboard.
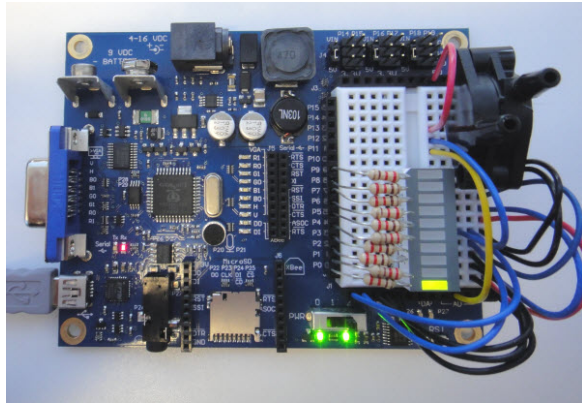
To see output on the Parallax Serial Terminal, open the Parallax Serial Terminal program, or press F12 on your keyboard. Then, on the Parallax Serial Terminal program's window, select the correct COM port and Baud Rate. The baud rate you select should match the PC_BAUD setting in the source code; the default baud rate in the source code is 115,200 baud. You should see readings displayed similar to the screenshot below.