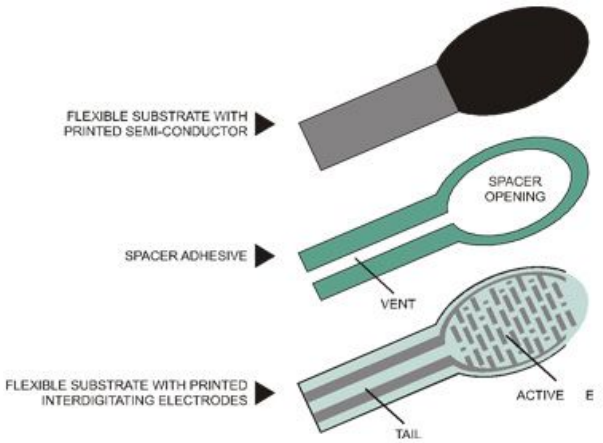
Z2M Part Number:
EDT-00006-A

Force Sensitive Resistance (Technical Note)

FSR 402

Introduction

A **Force Sensitive Resistor** (FSR) offers variable resistance depending on the pressure on the sensor. The resistance may be translated to voltage with a simple circuit. Generally used to measure weight or force. Pressure is defined as force per unit area. Since the area of the sensor is known, it could be used to measure pressure in certain applications.



Construction of FSR 402

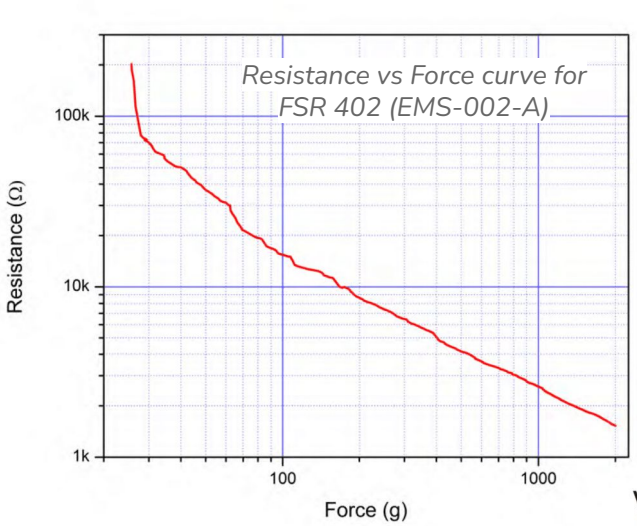
Scientific Fact and Applications

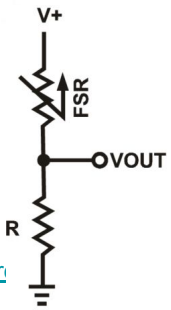
Inspired by the pressure sensitive insects, a device is built with membrane that would excite electrons and thus respond to the changes in pressure electrically.

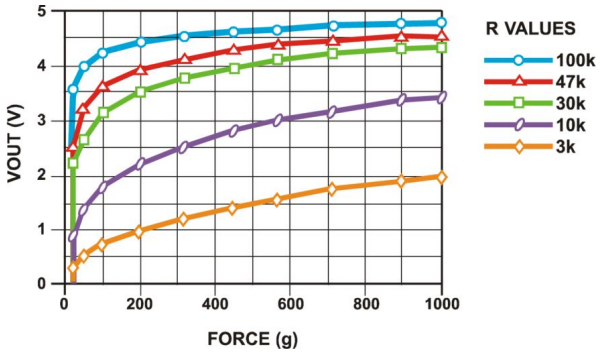
An FSR is typically made of two layers separated by a spacer. The more one presses, the more of those active element dots (bottom layer) touch the semiconductor (top layer) and that makes the resistance go down.

Application

Force-sensing resistors are commonly used to create pressure-sensing "buttons" and have applications in many fields, including electrical musical instruments and car occupancy detectors.







References:
1. www.makerguides.com
2. https://learn.adafruit.com/force-sensitive-resistor-fsr/overview

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Force Sensitive Resistance (Application Note)

Project

To display readings on the serial monitor when force is exerted to the Force Sensing Resistor (FSR).

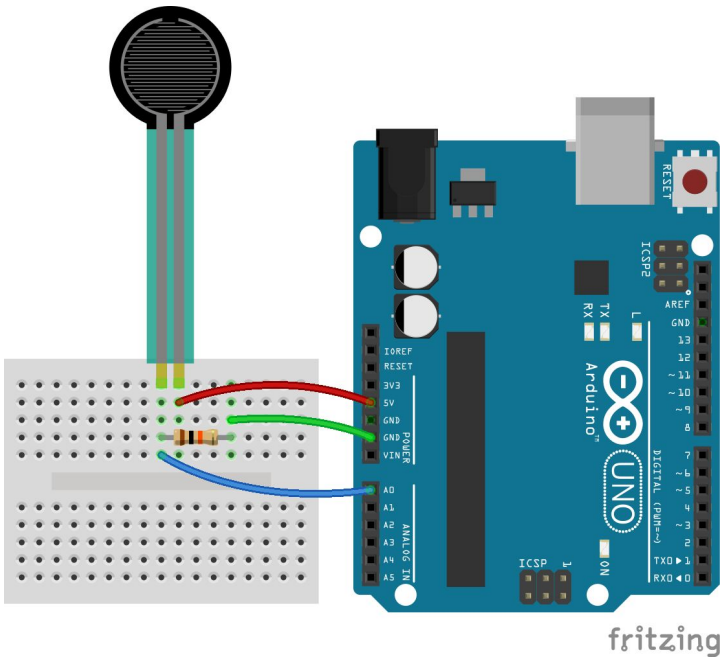
Procedure

1. Connect one end of the FSR to **5V** of the Arduino.

2. Connect the other end of the FSR to **A0** pin of the Arduino. With the same end, connect it to the **GND** pin of the Arduino with a 10k resistor in between.

3. Upload code to Arduino and open Serial Monitor to check the sensor readings.

Schematic



Components Required

Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
FSR402 0.5 inch Pressure Sensor	EDT-00006-A	1
100k Resistor	EDR-00001-10k0	1

Code

```
int pressureAnalogPin = A0;
/*pin where our pressure pad is located.*/
int pressureReading;
/*variable for storing our reading*/

/*Adjust these if required.*/
int noPressure = 0;
/*threshold for no pressure on the pad*/
int lightPressure = 200; /*threshold for
light pressure on the pad*/
int mediumPressure = 700; /*threshold for
medium pressure on the pad*/

void setup(void) {
  Serial.begin(9600);
}

void loop(void) {
/*Receive and print analog data from pin A0*/
pressureReading =
analogRead(pressureAnalogPin);

  Serial.print("Pressure Pad Reading = ");
  Serial.println(pressureReading);

/*Compare to thresholds and print on Serial
Monitor*/
  if (pressureReading < noPressure) {
    Serial.println(" - No pressure");
  } else if (pressureReading < lightPressure)
{
    Serial.println(" - Light Pressure");
  } else if (pressureReading <
mediumPressure) {
    Serial.println(" - Medium Pressure");
  } else{
    Serial.println(" - High Pressure");
  }
  delay(1000);
}
```

Challenge Yourself

1. Create a kitchen weighing scale.
2. Create a coin counter that learns the weight of an individual coin and counts number of coins in a bag of coins.