Arduino PCB Shield Walkthrough

Introduction to Soft Robotics | ME10466

Introduction: This board is a shield for an Arduino that allows for the soft robot actuator to be controlled off an Arduino. The Shield is placed on top of the Arduino so that each of the header pin rows lines up.

Abbreviated BOM

Name	Designator	Quantity
0.1 µF 0603 SMD Capacitor	C1, C2, C3	3
1N4007FLTR	D1, D2	2
Header 8 Pin	J1, J3	2
Header 6 Pin	J2	1
Header 10 Pin	J4	1
691103110002 – 3.5mm Screw Terminal	J5, J6, J7, J8, J9	5
IRF7301	Q1	1
10.0 kΩ 0603 SMD Resistor	R1, R2, R3, R4, R5, R6, R7	7
Push Button Switch	S1, S2, S3	3
Adafruit MPRLS Pressure Sensor	U1	1

Full bill of materials can be found on the [GitHub Repository](#)

Pin I/O:

Digital Pins

- D2 = Emergency Button
- D3 = Valve Out
- D4 = Pump Out
- D5 = Button Input 1 (S1)
- D6 = Button Input 2 (S2)
- D7 = Button Input 3 (S3)

Analog Pins

- A0 = Flex Sensor
- A4 = Adafruit MPRLS, Serial Clock (SDA)
- A5 = Adafruit MPRLS, Serial Data (SCL)

Power

- 5 Volts to the USB port from a computer
- 9 Volts from the 9V battery snap to the corresponding screw terminal

Instructions:

1. Once the Shield is connected to the Arduino, start connecting each component to the Shield. Follow the Pin I/O list when connecting the parts.

2. Component placement can be found on the BOM above in the designator column.
3. Once everything is connected you can start to write code for the Arduino.
4. Make sure both the USB port on the Arduino is plugged in as well as a 9 Volt battery. This is because some parts use 9 Volts while others use a much lower amount of voltage. The 9V battery must be connected for the pump to run.
5. Run the code and watch it go.