Introduction to Soft Robotics

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Tutorial 3: Pumps and valves

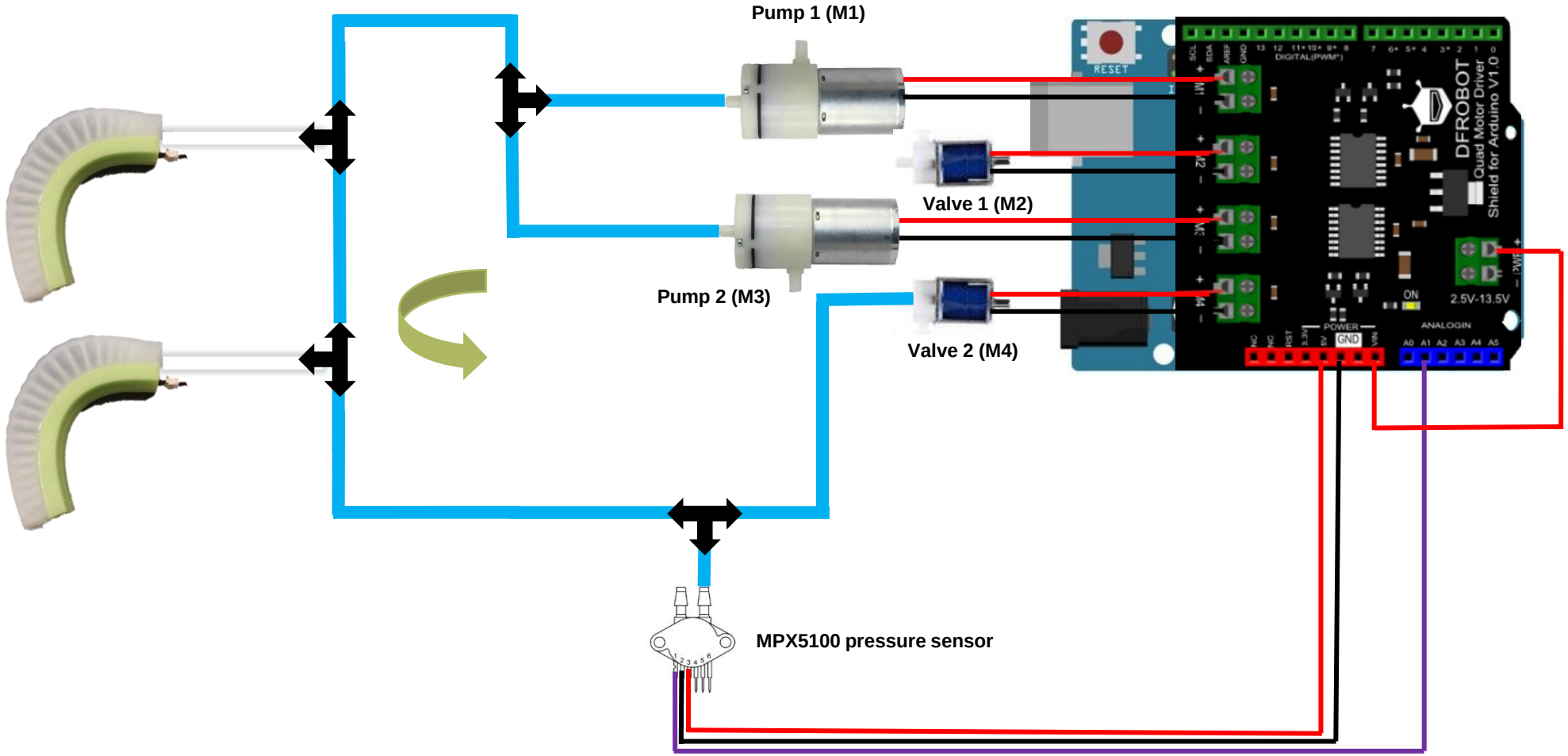

Figure 2. Pneumatic system for two PneuNets and MPX5100 pressure sensor using DFROBOT motor driver for Arduino Uno

Code Information

Arduino Code

→ Download ***Pump_valve_simple_control*** sketch at GitHub Link

Arduino Motor controller functions

```
void motor_1_on(int motorspeed);   // Pump 1 activation motor speed range between 0 - 255   --> 0 - 5 Volts
void motor_2_on(int motorspeed);   // Pump 2 activation motor speed range between 0 - 255   --> 0 - 5 Volts
void motor_1_off(void);            // Pump 1 deactivation  (motor speed == 0)
void motor_2_off(void);            // Pump 2 deactivation  (motor speed == 0)

void valve_1_on(void);             // Valve 1 activated -->  5V
void valve_2_on(void);             // Valve 2 activated -->  5V
void valve_1_off(void);            // Valve 1 deactivated -->  0V
void valve_2_off(void);            // Valve 2 deactivated -->  0V
```

Arduino Time Control:
Sample time = 100 [ms]

```
delay(100);   // defining sample time = 100 miliseconds
```

Code Information

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Sample time = 100 [ms]

```
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```

Example:

```
//Controlling the time of the process
if (timecounter <= 30)      // 3 seconds == 30 * 100 ms
{
  // Introducion air to the PneuNets
     motor_1_on(250);
     valve_1_on();
     timecounter++;
  }
 else if ( timecounter > 30 and timecounter<= 60 )
 {
  motor_1_off();
  valve_1_on();
  timecounter++;
  }
```

```
  else if ( timecounter > 60 and timecounter<= 90)
  {
  motor_1_off();
  valve_1_off();
  timecounter++;
    }
  else if ( timecounter > 90)
  {
    timecounter=0;
    }
```