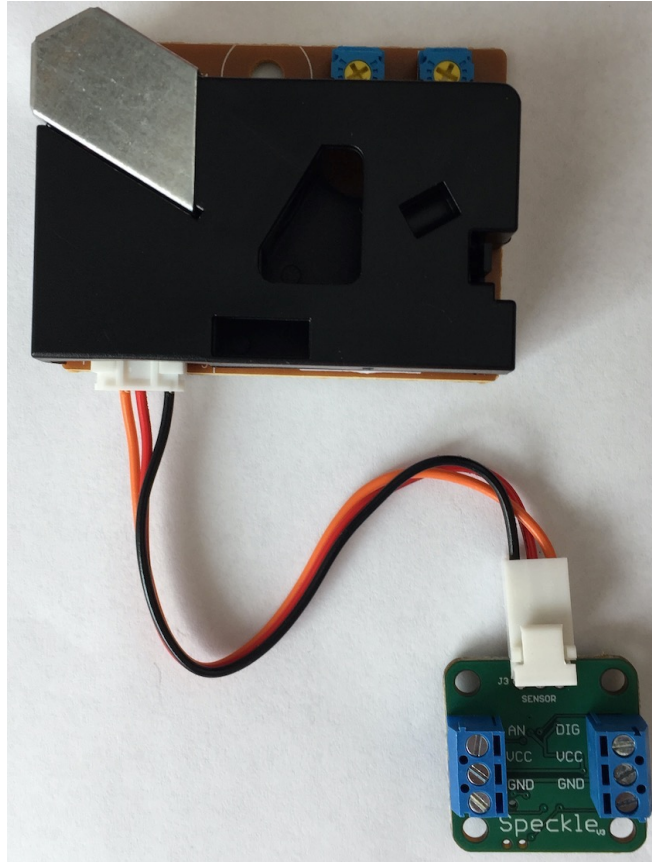


Speckle



- Allows easy prototyping and air quality device development by providing pre-filtered, uncalibrated sensor data.
- Two interfaces are given to the user, an analog voltage, and digital serial stream.
- Can operate at either 3.3 volts, or 5 volts.

Power

- $V_{cc} = 5 \text{ volts}$, $i_{typ} = 150\text{ma}$
- $V_{cc} = 3.3 \text{ volts}$, $i_{typ} = 175\text{ma}$

Speckle

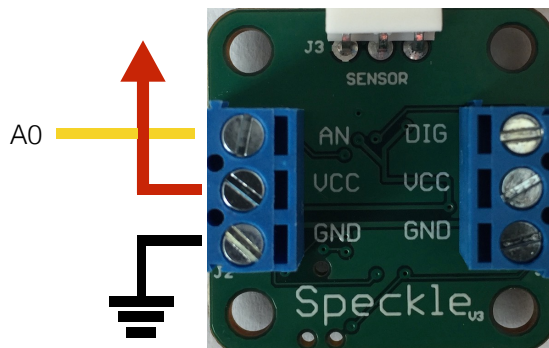
Analog Interface

- $V_{cc} = 5 \text{ volts}$, $\text{count} = 120 \times V_{out}^2$
- $V_{cc} = 3.3 \text{ volts}$, $\text{count} = 273 \times V_{out}^2$

*Count is capped at 3000

Arduino Example:

```
void setup() {  
  Serial.begin(9600);  
}  
  
void loop() {  
  int  sensorValue = analogRead(A0);  
  float voltage    = sensorValue * (5.0 / 1023.0);  
  float voltage2   = voltage*voltage;  
  float count      = voltage2*120;  
  
  Serial.print(voltage);  
  Serial.print(",");  
  Serial.print(voltage2);  
  Serial.print(",");  
  Serial.println(count);  
}
```



Speckle

Digital Interface

- Serial communication is an ascii parseable string, fed out of the DIG pin
 - Format: 9600/8-N-1
 - Speed: 1hz
 - Termination: CR&LF
- The format is comma delimited, with three fields raw, count, and mass
 - Raw - pre processed data from the sensor
 - Count - approximate particles per liter from the sensor, range from 0-30000
 - Mass - approximate micrograms per cubic meter from the sensor, range from 0.0-1224.0
- Example: "370,1000,40.8\r\n"
 - Raw = 370
 - Count = 1000
 - Mass = 40.8

Python Example:

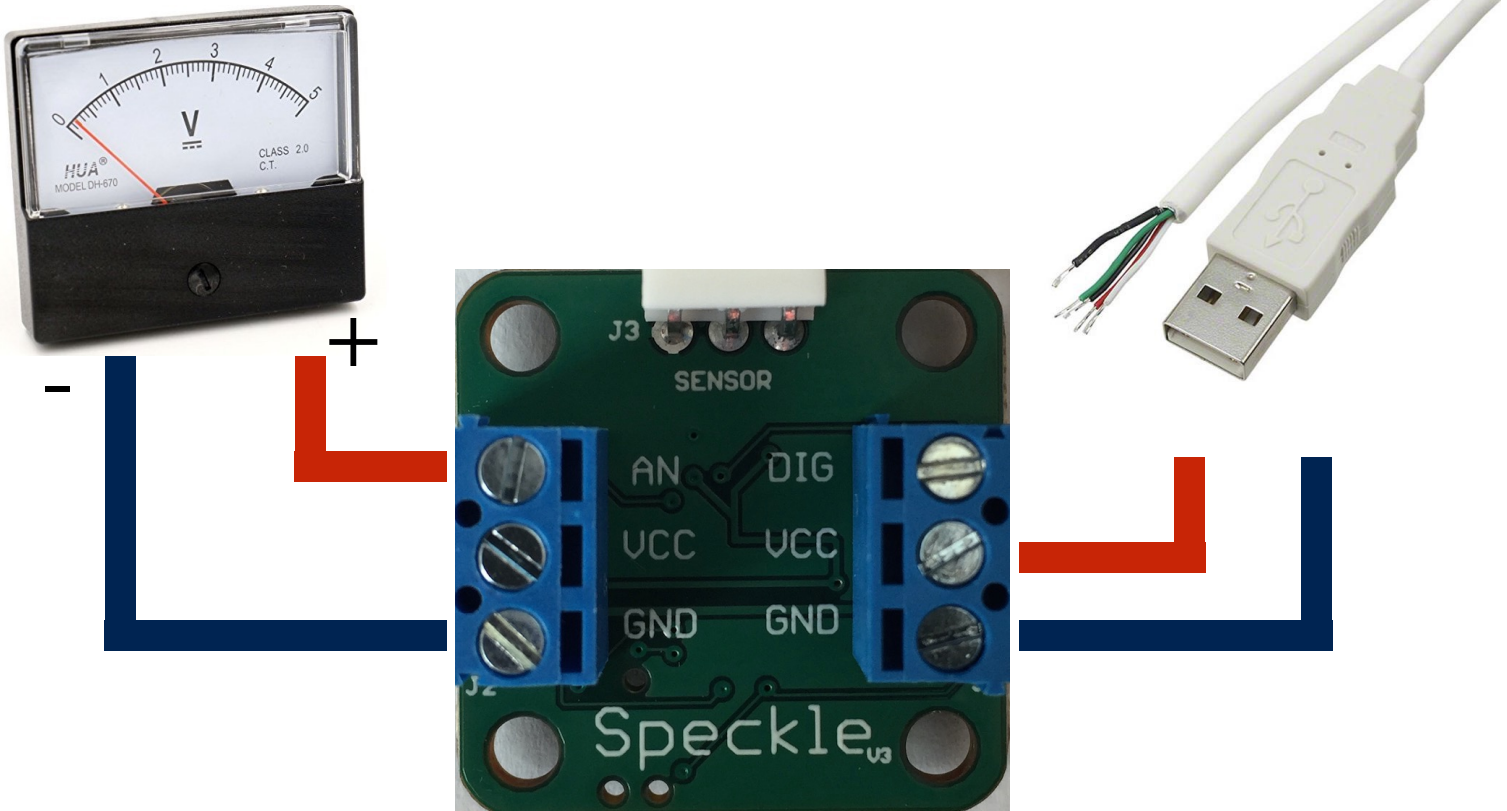
```
import serial
import glob
import time

ser = serial.Serial('/dev/tty.usbserial')

while True:
    values = ser.readline().strip()
    currentTime = time.time()
    print str(currentTime)+" "+values
```

Speckle

Panel Meter Example



Panel meter: <https://tinyurl.com/z99r33z>
Wire for meter: <https://tinyurl.com/z27kbja>
Crimps for wire: <https://tinyurl.com/zsyw3kh>
USB cable: <https://tinyurl.com/jrjcdja>