1. Introduction

The I²C bus consists of two bidirectional signals (clock and data) shared by a Master and one or more Slaves, where each Slave has a bus-unique address. In this application, we display force measurements from multiple SingleTact sensors connected as Slaves on an I²C bus controlled by an Arduino.

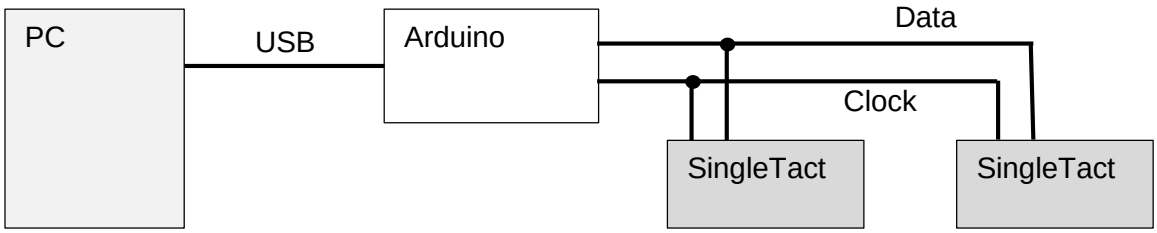


Figure 1: I²C connection between Arduino(master) and SingleTacts(slaves).

You can read more about I²C in the specification document or on Wikipedia.

2. Getting Started

Before you start, you will need:

1. Two or more SingleTact sensors
2. Two or more SingleTact electronics modules
3. Twelve jumper wires
4. An Arduino UNO
5. Arduino Software (IDE). If your PC doesn't recognise the Arduino board, additional board drivers need to be installed https://www.arduino.cc/en/Guide/ArduinoUno#toc3)
6. USB cable
7. Computer

3. Configuring the I²C address

Connect the SingleTact sensor with the Arduino UNO (one sensor at a time).

Connect the Arduino to the PC using the USB cable.

Download the PC DAQ binary from: https://github.com/SingleTact/PCExecutable

Open → PCExecutable folder → run SingleTact Demo.exe.

Choose different I²C Address for each sensor and address should be 0x05 and above.

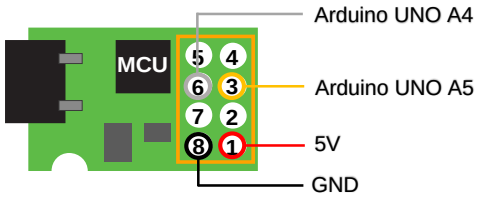
(Note: addresses 0x00 - 0x03 are reserved and 0x04 is default address).

Click on Set Configuration.

Repeat steps 4-7 for all sensors.

4. Multi-sensor I²C setup with Arduino UNO

Connect the sensors into the connector on the green interface boards, connect Arduino and all interface boards on a common I²C bus using master-multiple slave I²C configuration as shown in the figure.



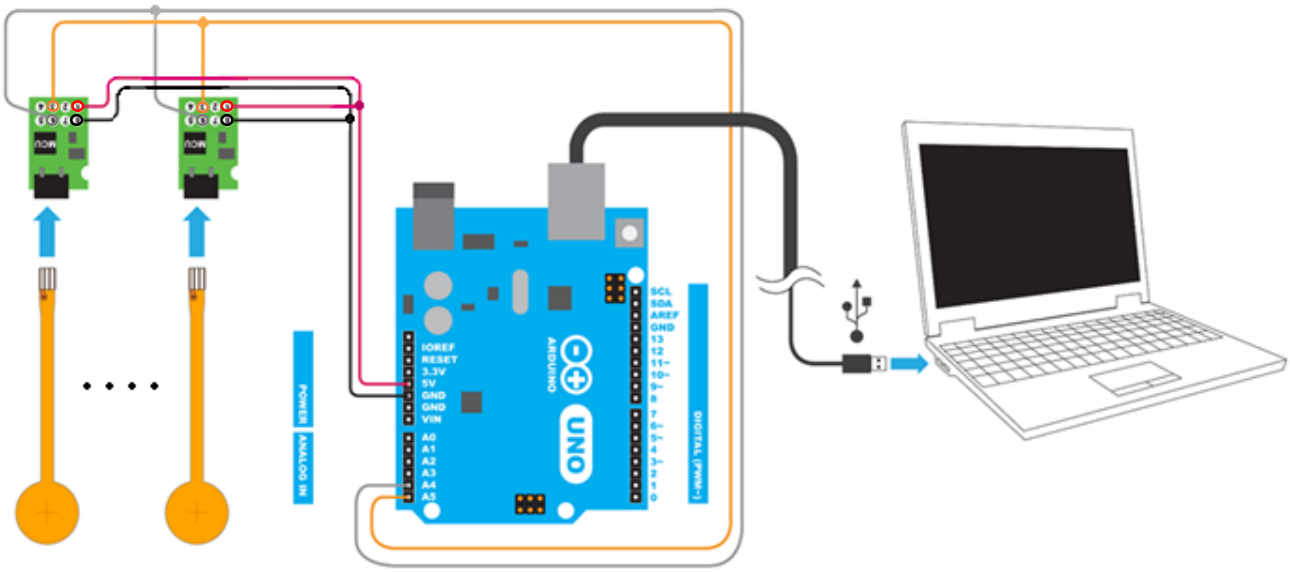


Figure 2: Arduino with multi SingleTact sensors.

5. Running the Arduino code

1. The Standalone Arduino and Multi SingleTacts code can be downloaded from: https://github.com/SingleTact/StandaloneArduino
2. Open the Arduino IDE software.
3. Go to File → Open → open StandaloneArduino folder → run SingleTactMultiSensorDemo.ino
4. Modify I²C addresses (*inside "void loop()", as shown in the Figure 3*) according to the previous modification has done in Section- 3, step-6.
5. Go to Sketch → Verify/Compile.
6. Go to Sketch → Upload
7. Click on Tools → Serial Monitor.
8. Remember to set the baud rate at **57600**.

```
void loop()
{
    byte i2cAddress; // Slave address (SingleTact), default 0x04
    short data;

        /* Note: No sensor should be addressed with default 0x04 value */
    // Reading data from sensor 1
    i2cAddress = 0x06;
    data = readDataFromSensor(i2cAddress);
    Serial.print("I2C Sensor 1 Data:");
    Serial.print(data);
    Serial.print("\n");
    delay(100); // Change this if you are getting values too quickly

    // Reading data from sensor 2
    i2cAddress = 0x08;
    data = readDataFromSensor(i2cAddress);
    Serial.print("I2C Sensor 2  Data:");
    Serial.print(data);
    Serial.print("\n");
    delay(100); // Change this if you are getting values too quickly
}
```

Change it according to your preferences

Figure 3: Part of Arduino code for Multi Singletact interface.

6. Troubleshooting

While running, the SingleTact Demo.exe may receive an error message indicating "invalid setting".

1. Check the pin configuration properly.
2. Follow the steps mentioned in the User Manual Section 4.2 (Programming the Arduino UNO with SingleTact Example).

Note: For more detailed information please check the User Manual on the SingleTact website https://www.singletact.com/SingleTact_Manual.pdf.

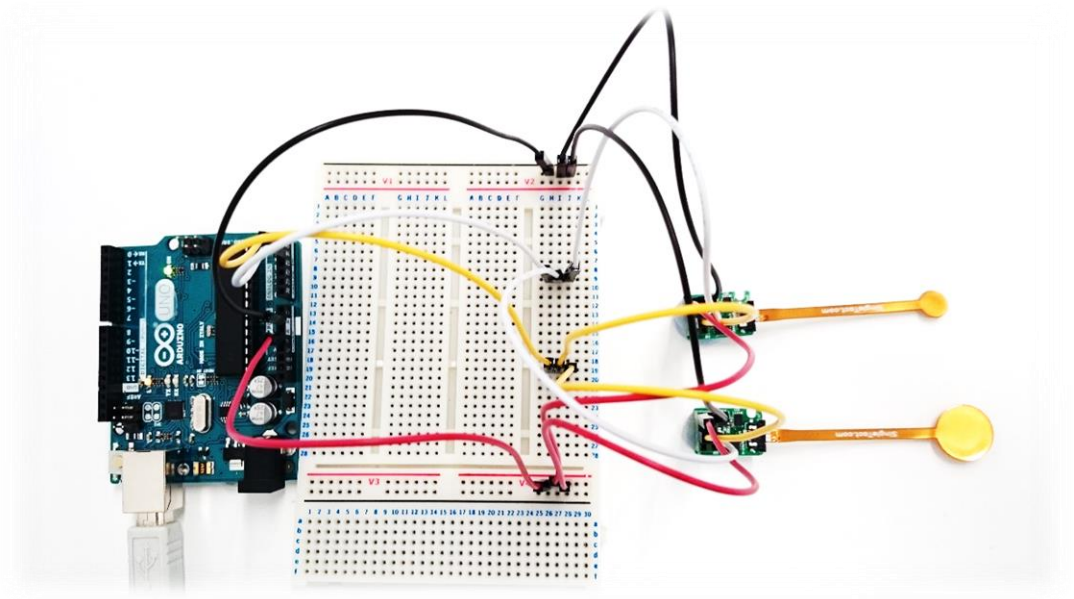


Figure 4: Arduino and Multi SingleTact circuit diagram.

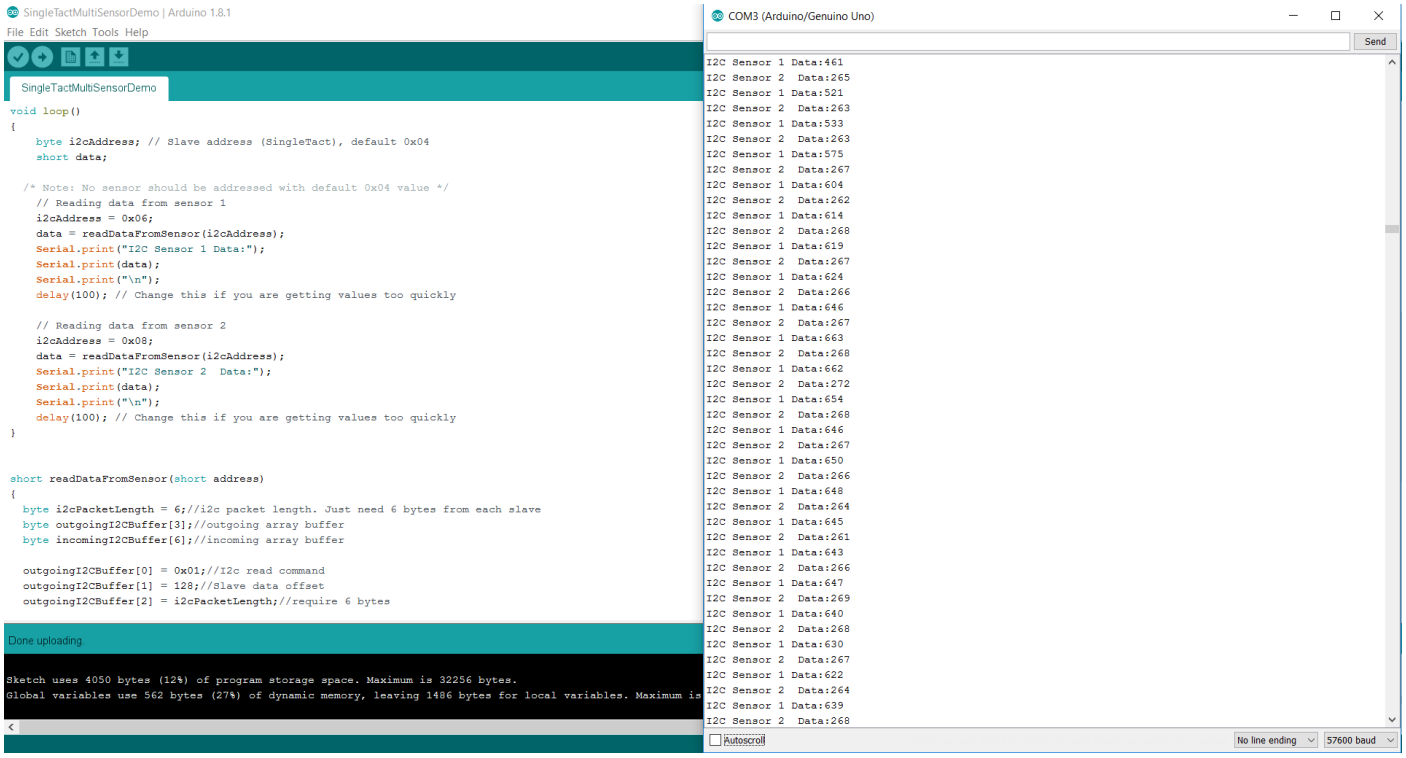


Figure 5: Example of serial port output.