

Chapter 1: First Look and Blinking Lights

Installing and using software

First look at the IDE

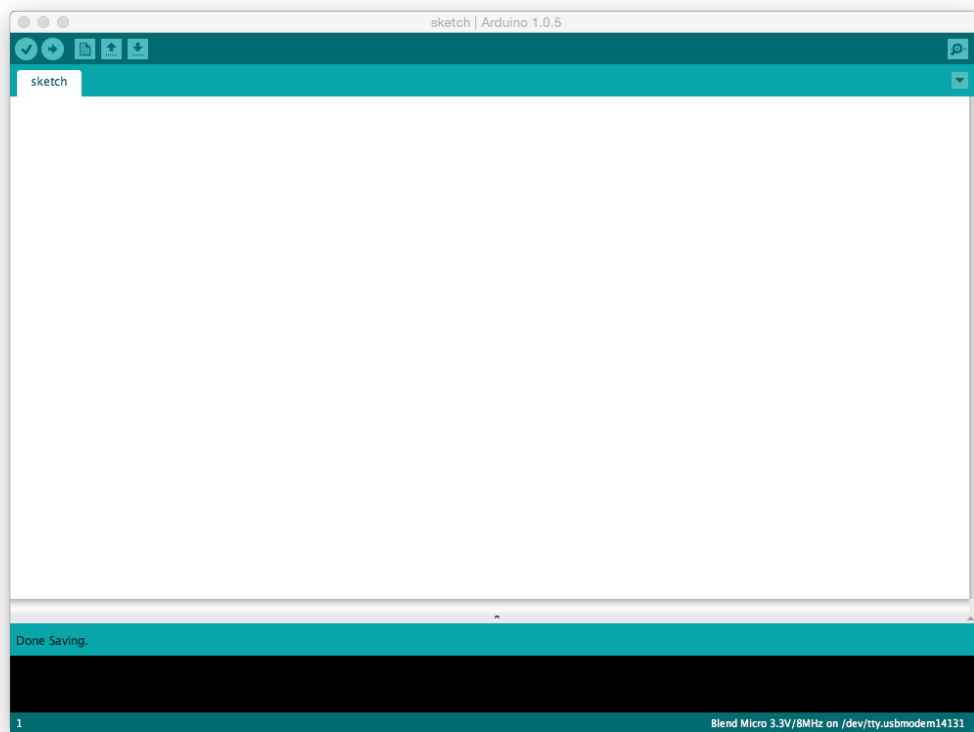


Figure 1.1: The Arduino IDE

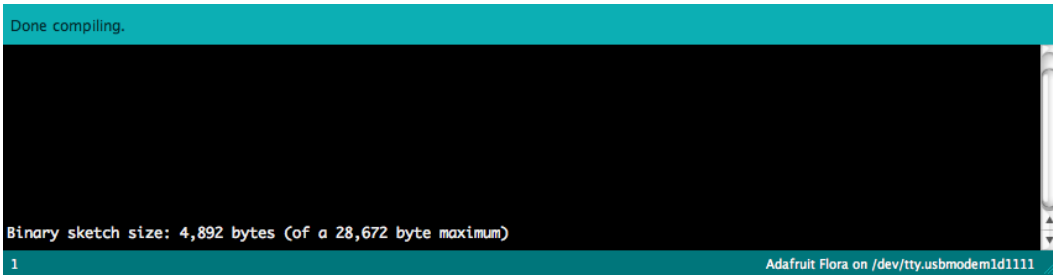


Figure 1.2: Compile message window



Figure 1.3: Error message in the compile window



Figure 1.4: The quick buttons

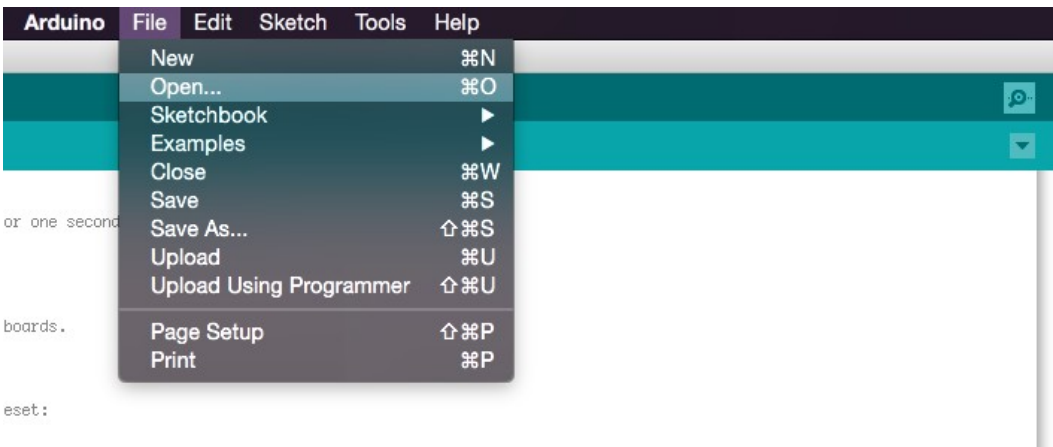


Figure 1.5: The File menu

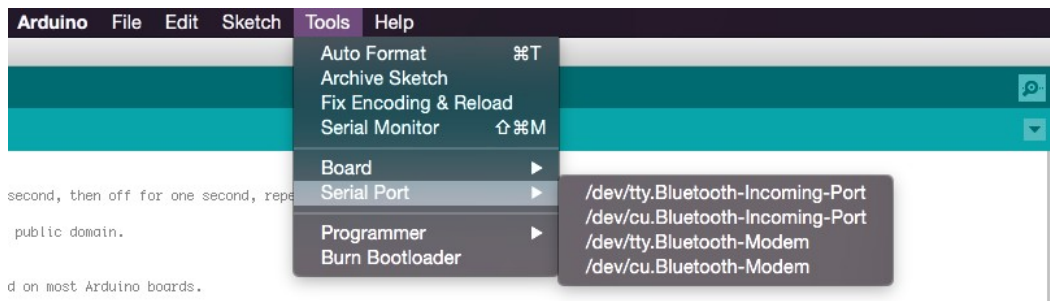


Figure 1.6: The Tools menu

Getting to know your board

FLORA board

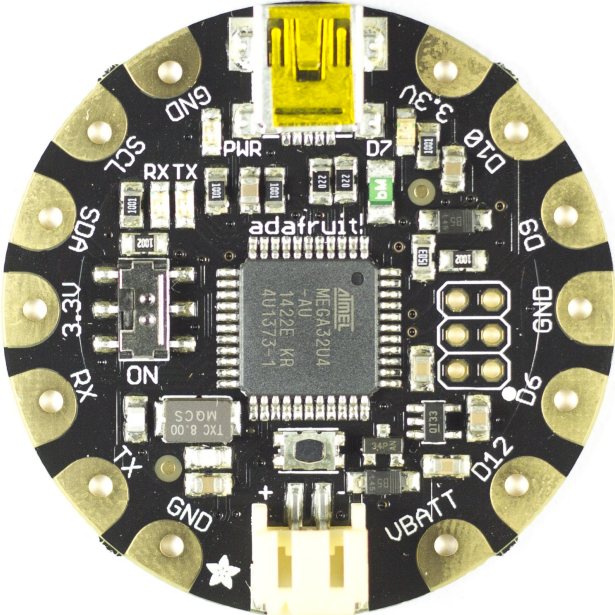


Figure 1.7: The FLORA board

Other boards

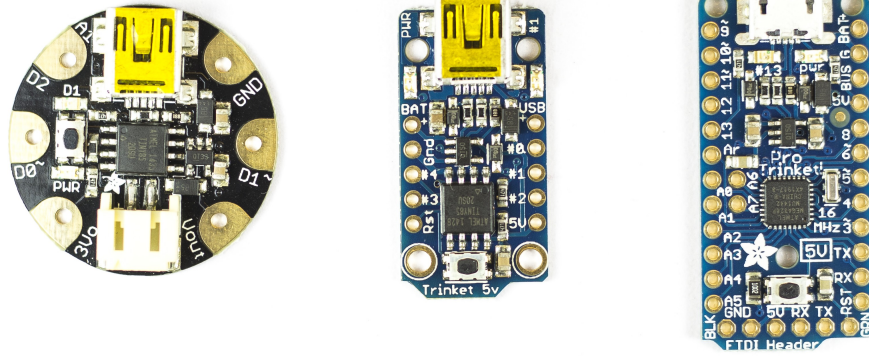


Figure 1.8: The Gemma, Trinket and Trinket pro board

Connecting and testing your board



Figure 1.9: USB to USB micro cable

Some notes on programming

External LED and blinking

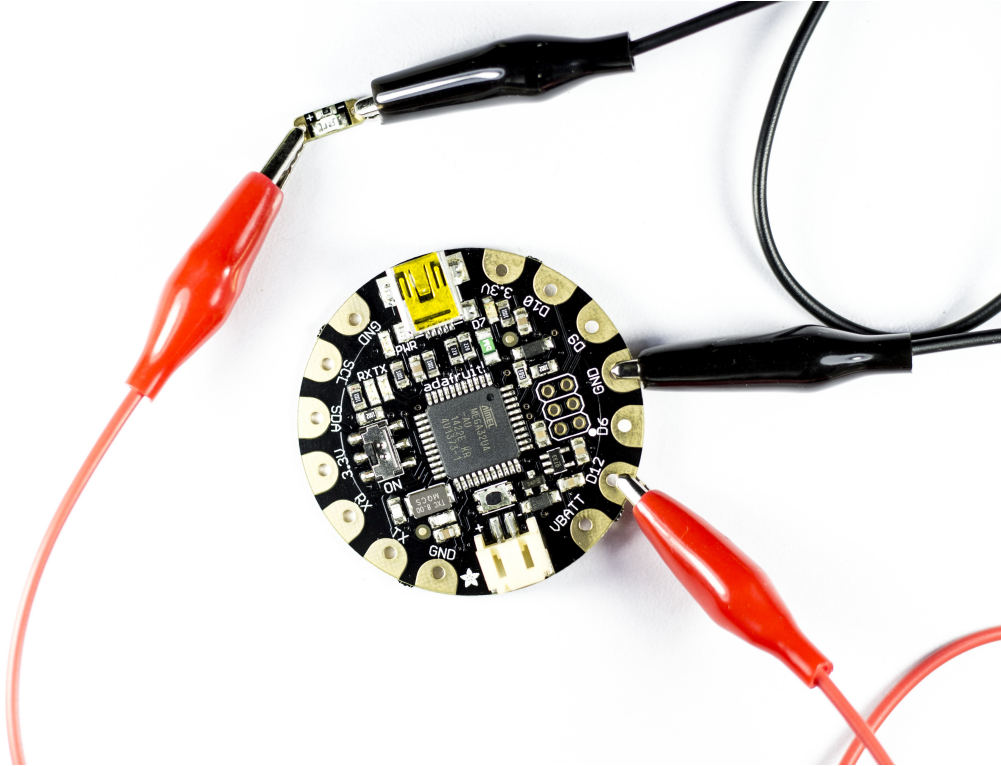


Figure 1.10. LED connected to the board using alligator clips

Chapter 2: Working with Sensors

Sensors

Bend sensor

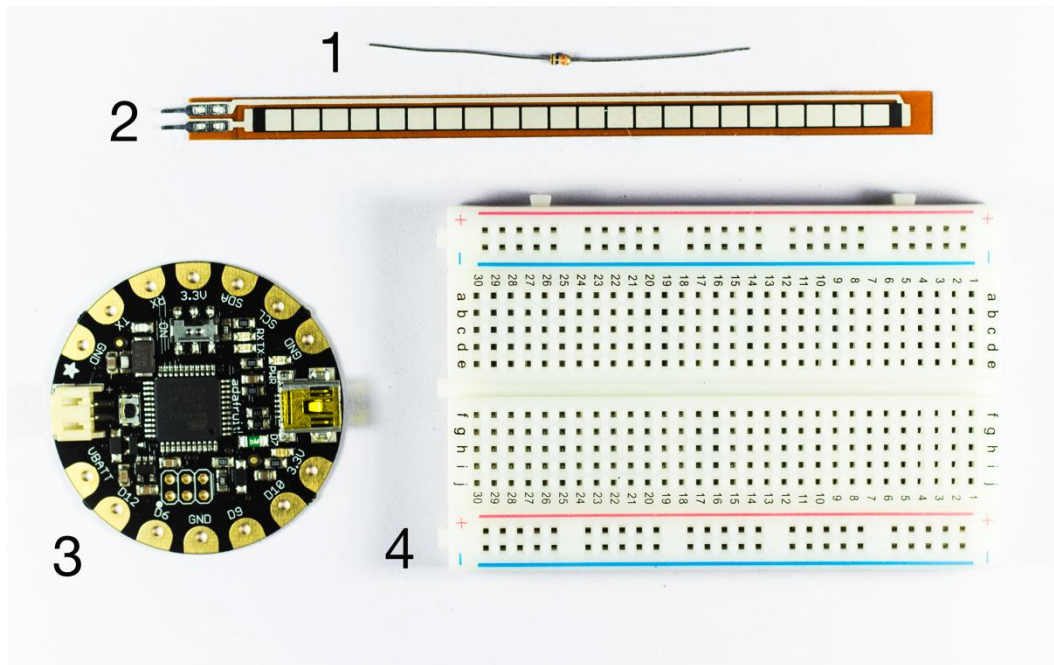


Figure 2.1: Showing 1. 10K resistor 2. Bend/flex sensor 3. FLORA board 4. Bread board

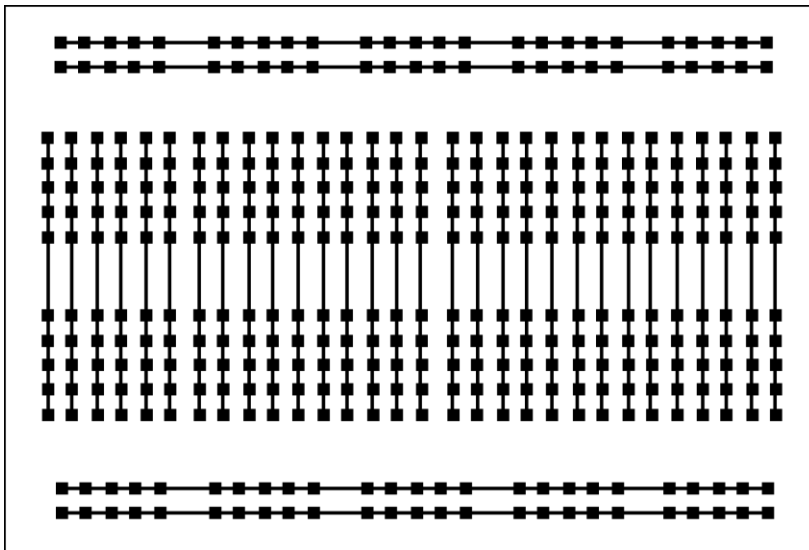


Figure 2.2: Internal connection of the breadboard

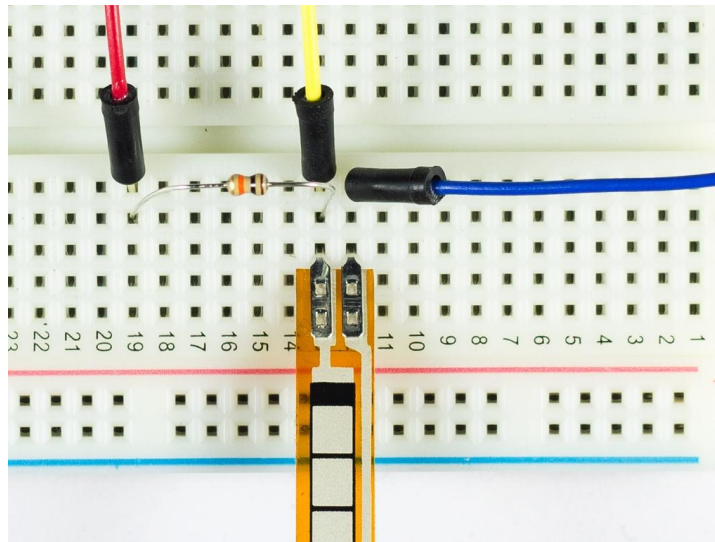


Figure 2.3: Close up of the breadboard connection

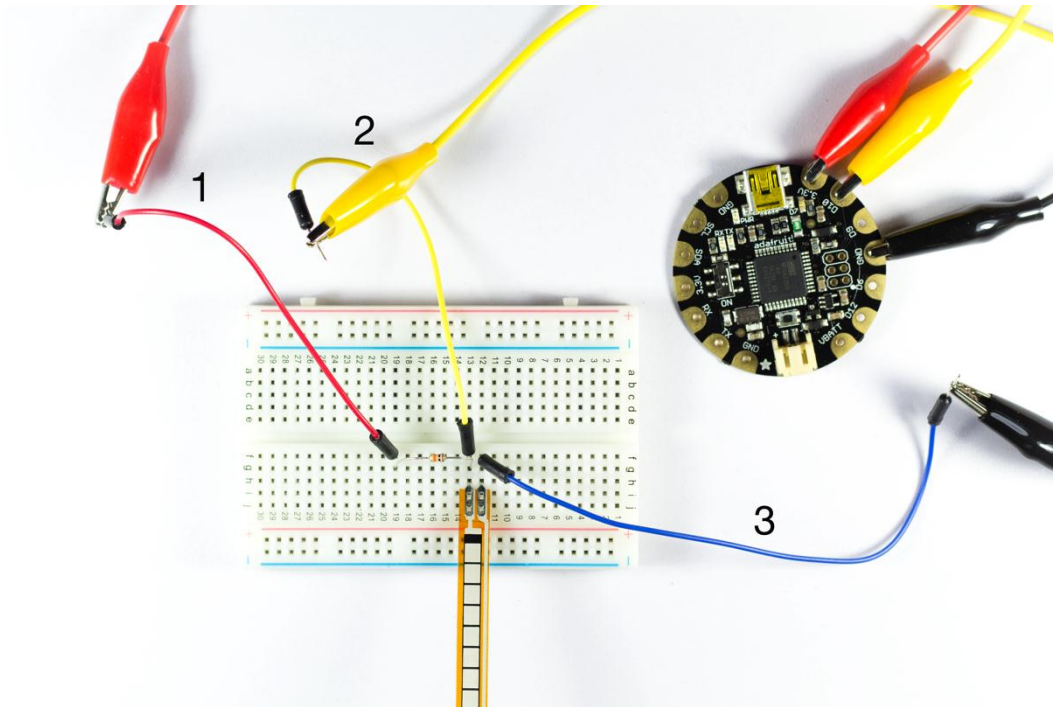


Figure 2.4: Connecting the bend sensor

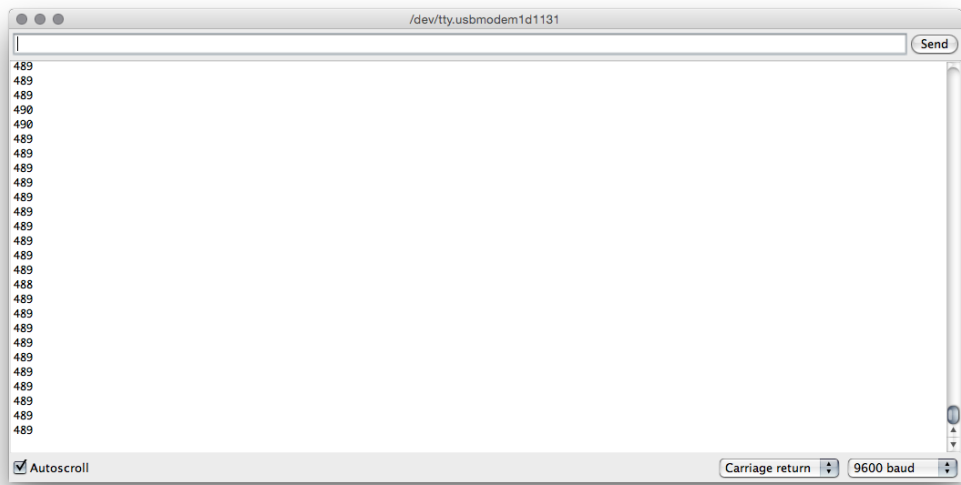


Figure 2.5: Showing the serial monitor

Pressure sensor

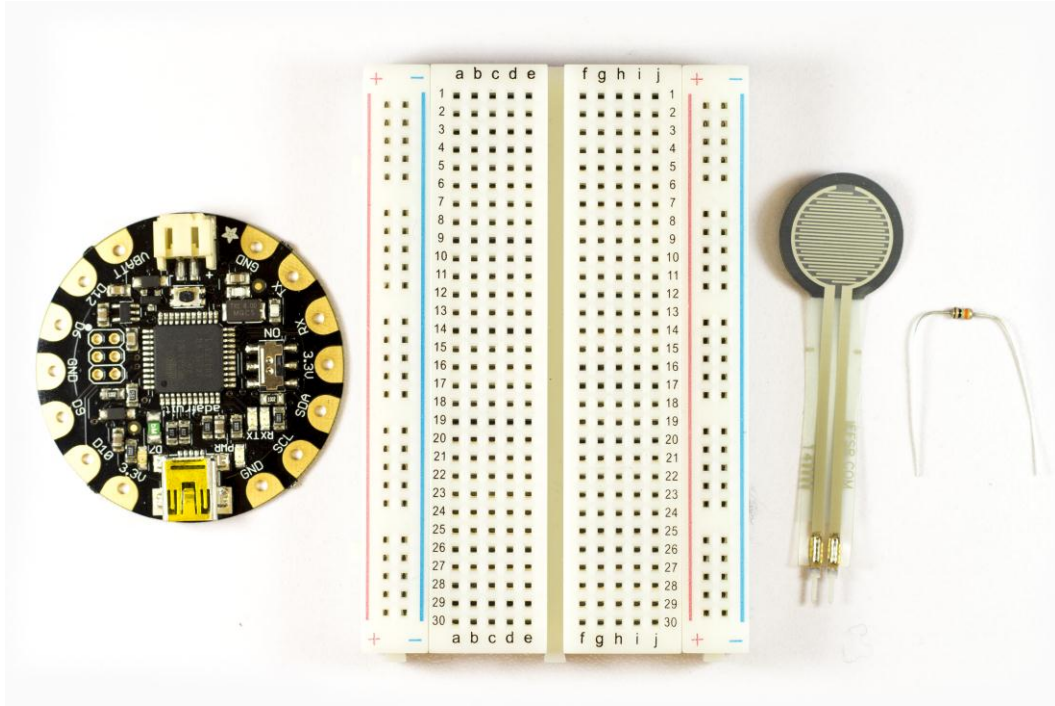


Figure 2.6: FLORA board, bread board, pressure sensor and 10K resistor

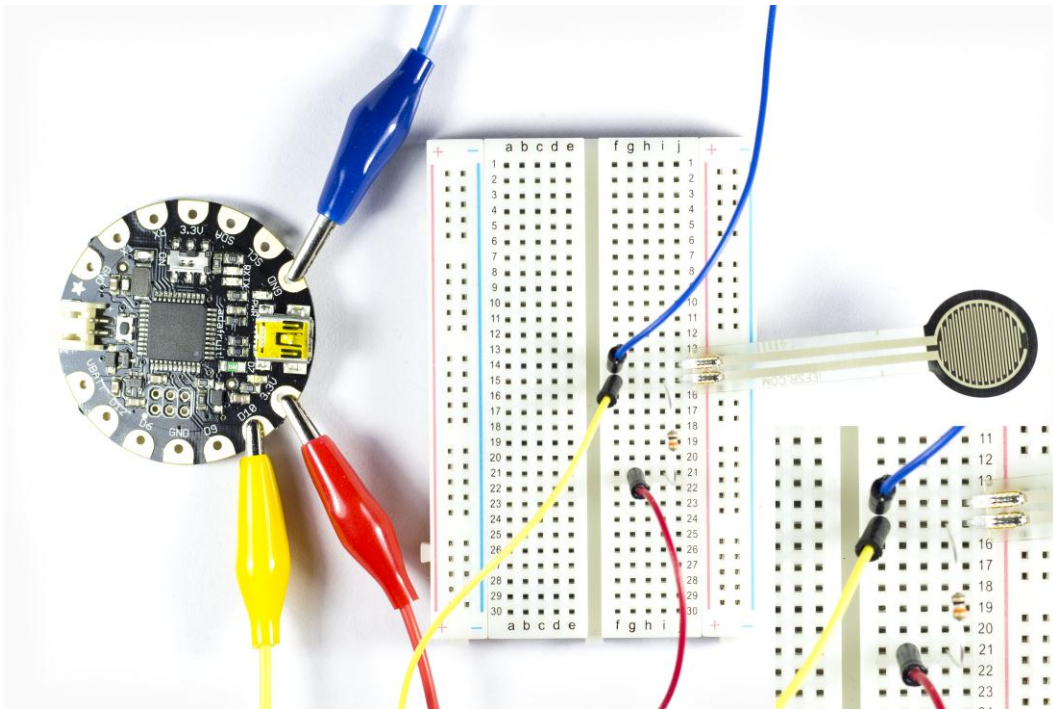


Figure 2.7: Showing the connections to the FLORA board

Light dependent resistors



Figure 2.8: PCB mounted LDR and resistor

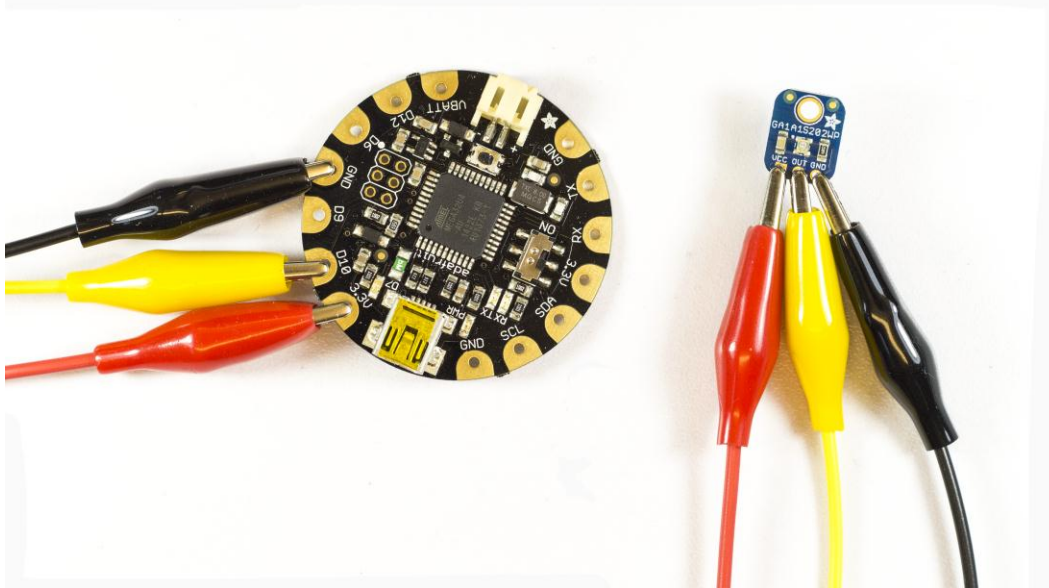


Figure 2.9: The LDR connected to the FLORA board

Accelerometer, compass, and gyroscope

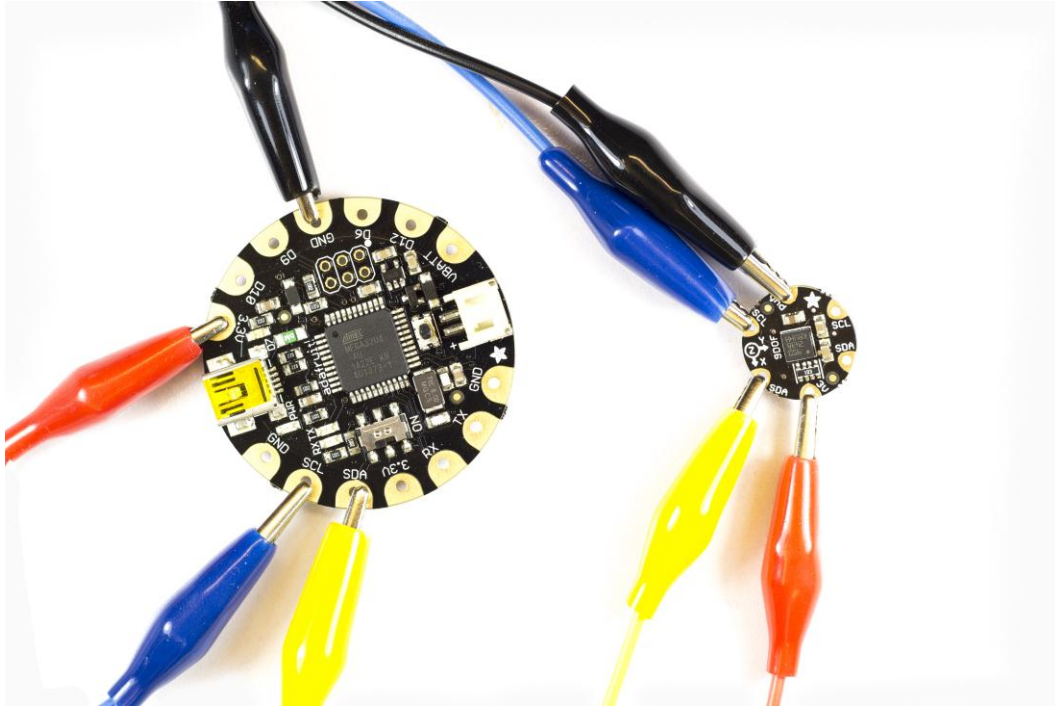


Figure 2.10: Connecting the sensor to the FLORA board

Chapter 3: Bike Gloves

Electronics needed

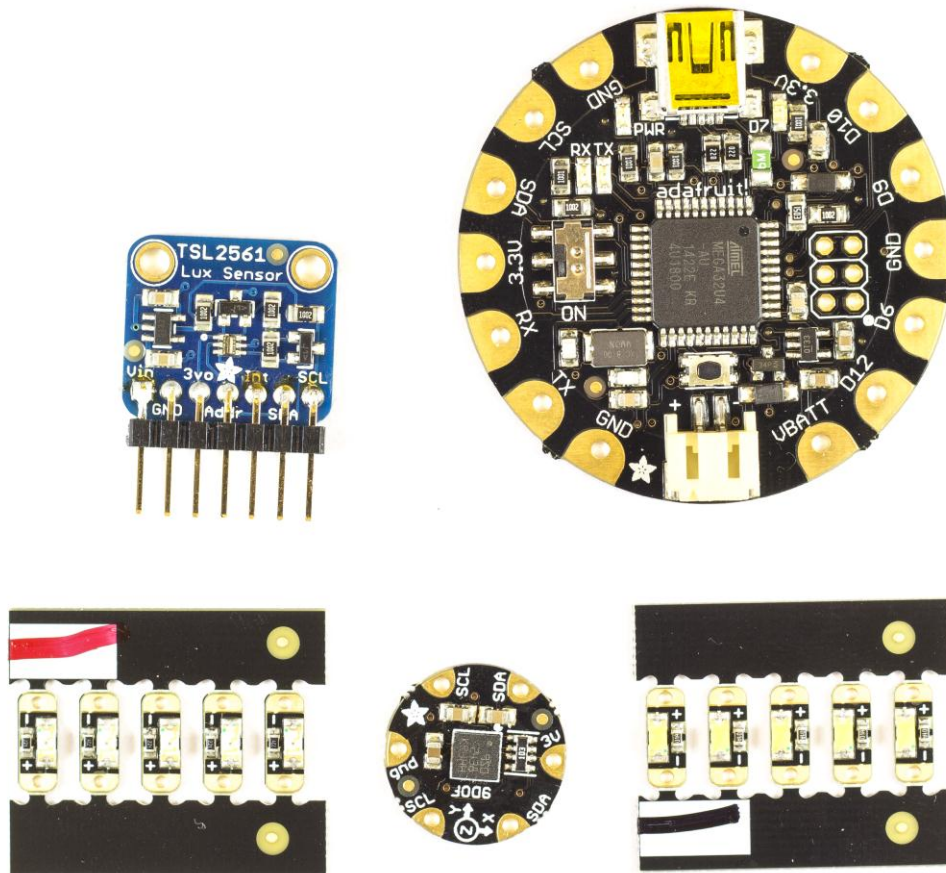


Figure 3.1: FLORA board, LEDs, accelerometer/compass/gyro, TSL2561

Trying out the TSL2561

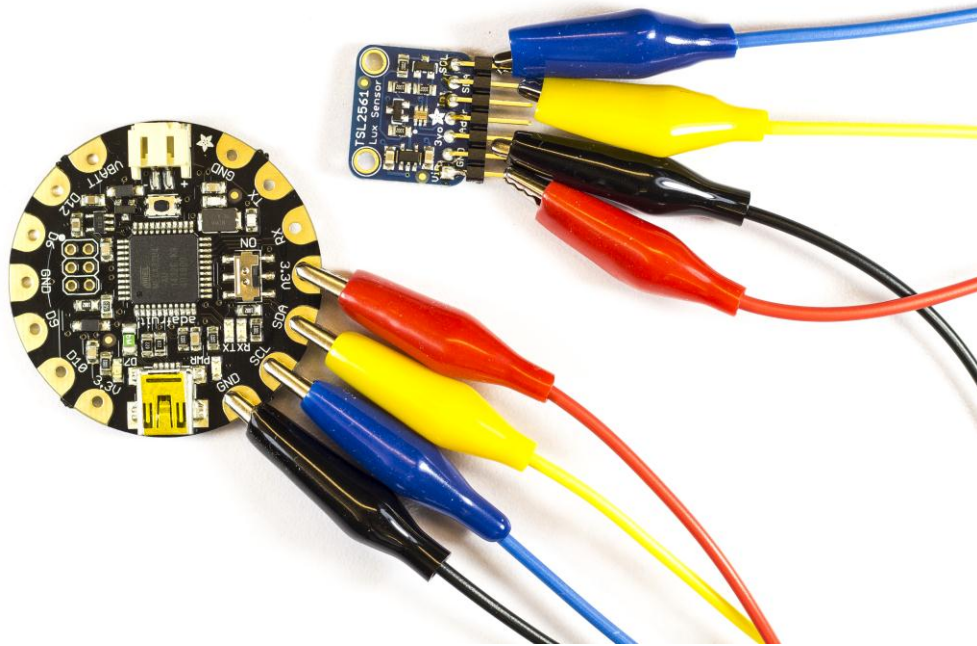


Figure 3.2: Showing the connections from the TSL2561 to the FLORA board

Making a glove

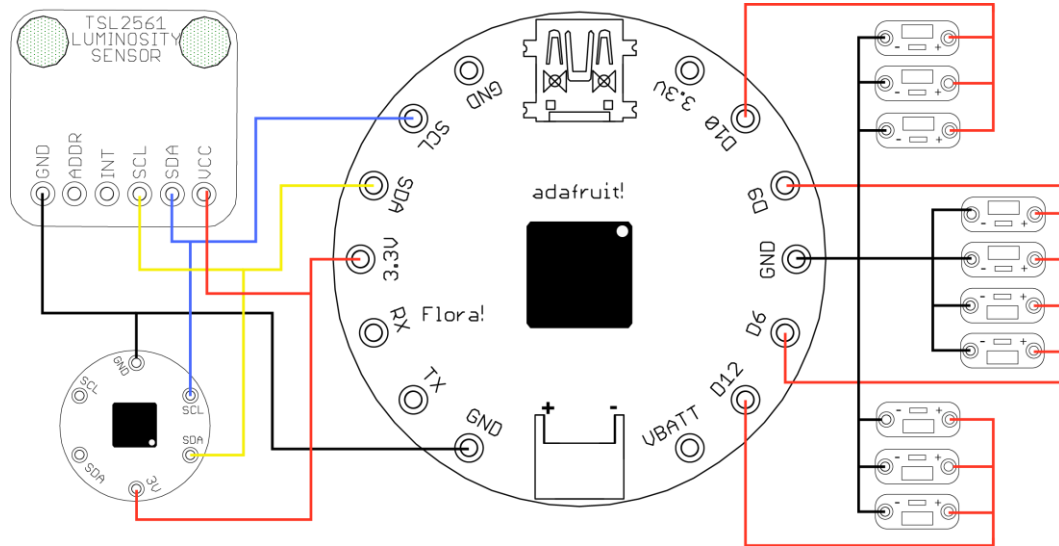


Figure 3.3: The connection needed for all the components

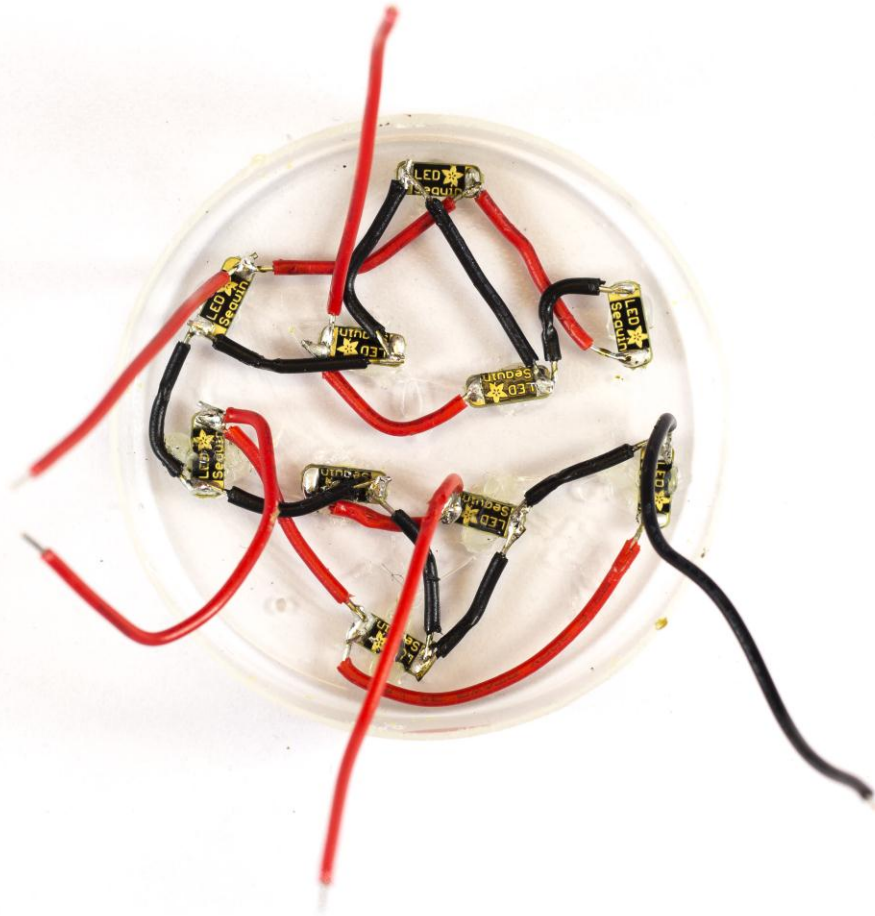


Figure 3.4: The LEDs soldered in place

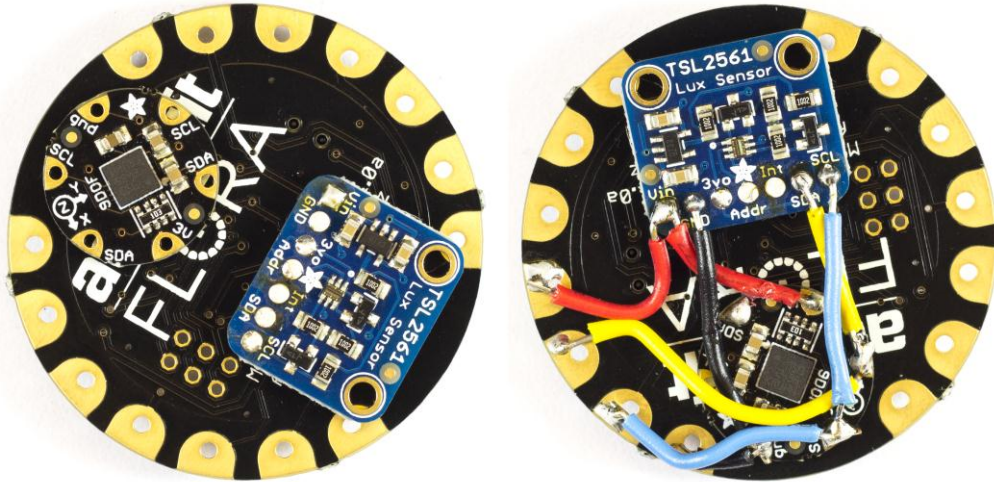


Figure 3.5: The TSL2561 and accelerometer connected and soldered to the FLORA

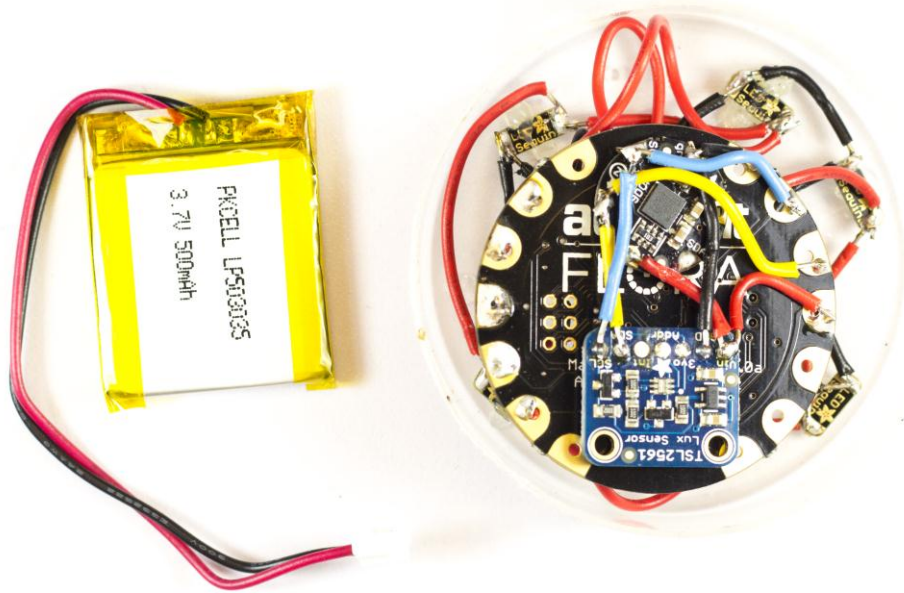


Figure 3.6: Showing a 3.7V battery and all the components in place

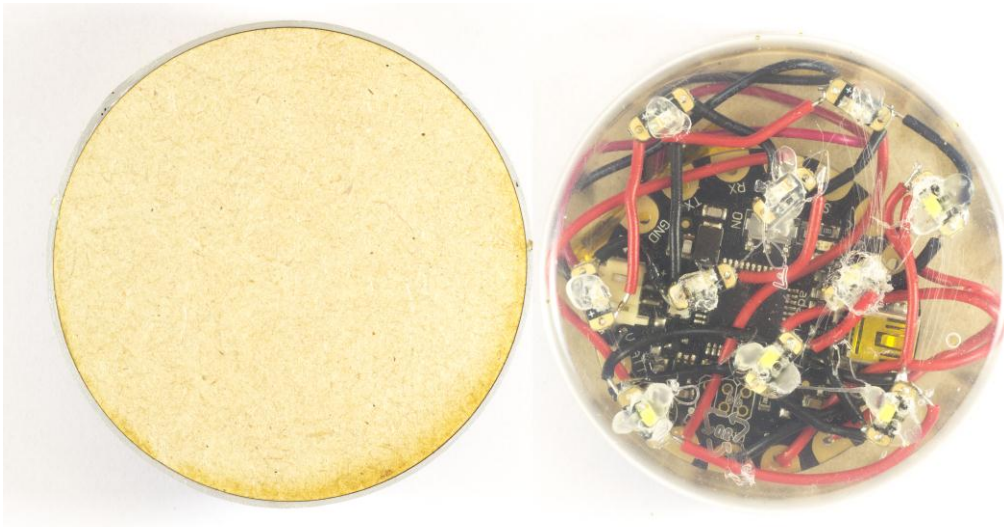


Figure 3.7: Everything in place

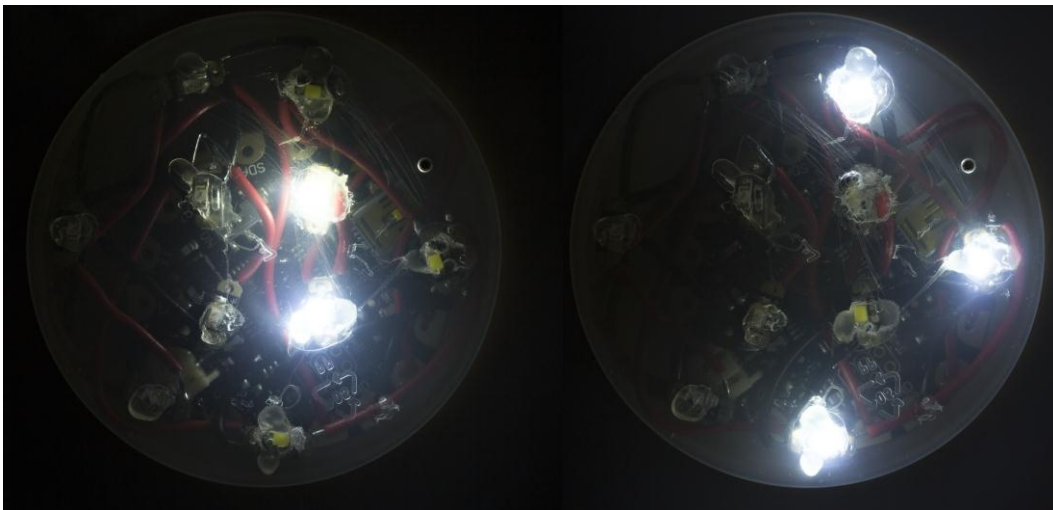


Figure 3.8: Bike lights blinking

Chapter 4: LED Glasses

Making the glasses

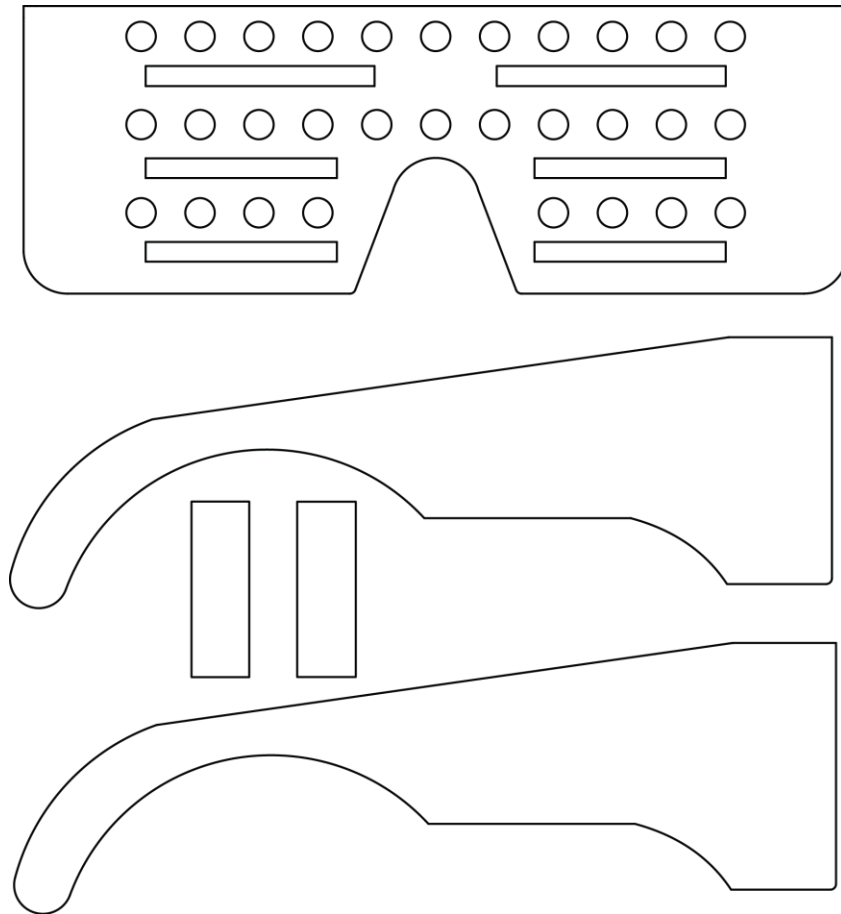


Figure 3.1: Glasses design

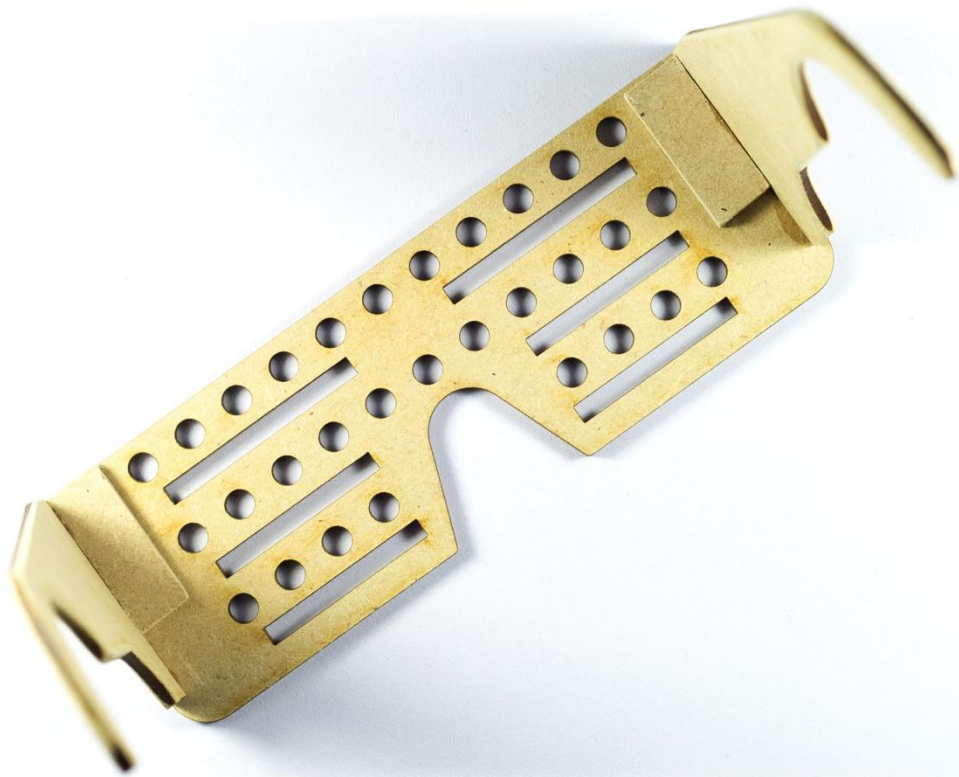


Figure 3.2: The laser-cut pieces

Entering the matrix

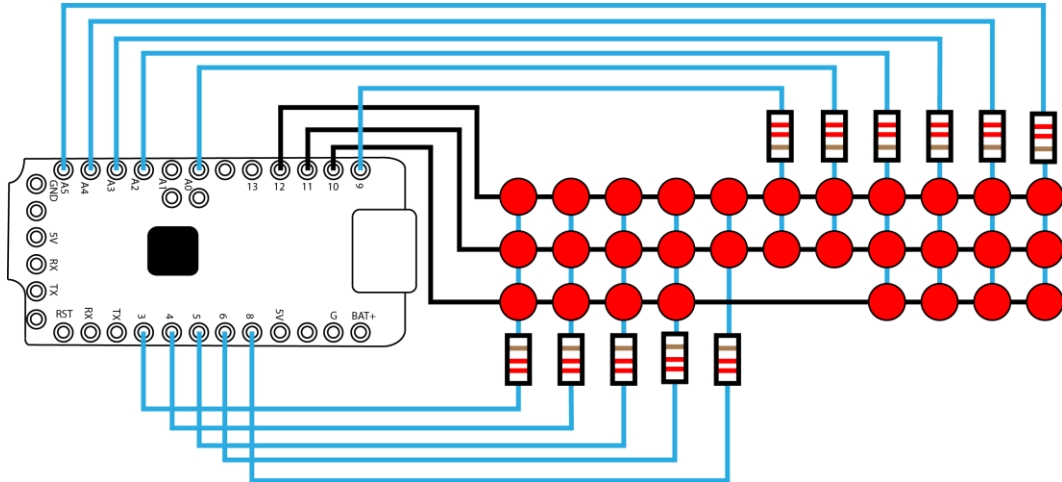


Figure 3.3: Matrix schematic



Figure 3.4: Showing all the LEDs lined up for soldering

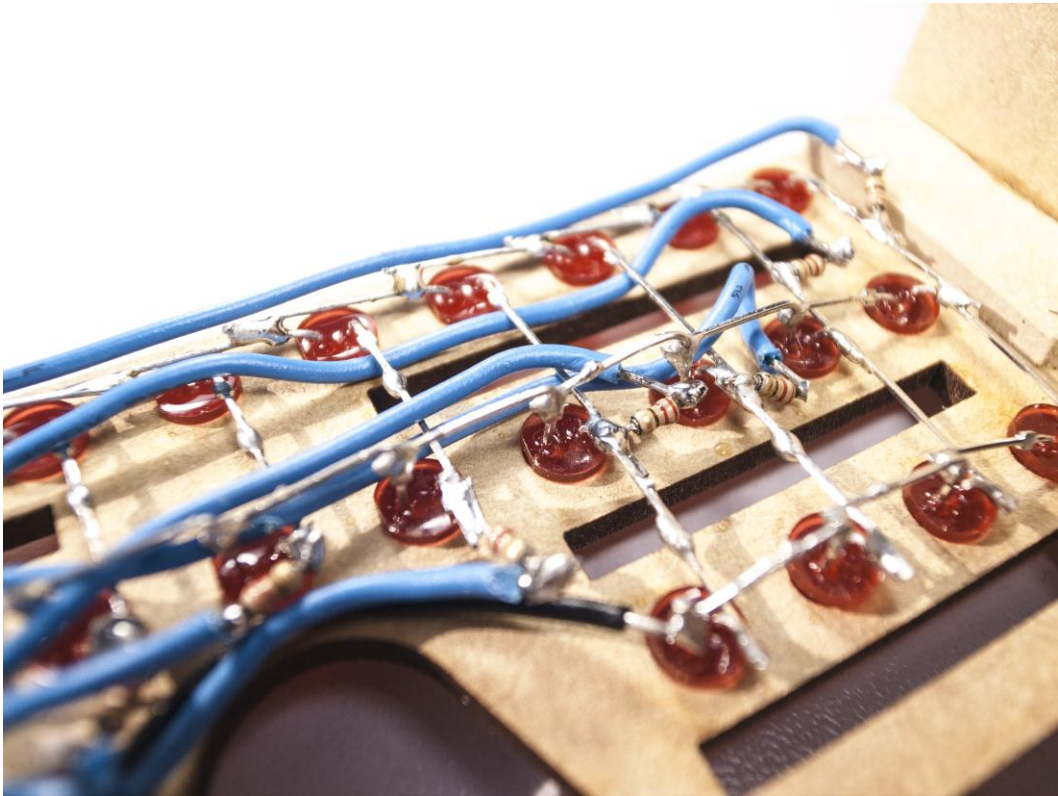


Figure 3.5: Close-up of the matrix

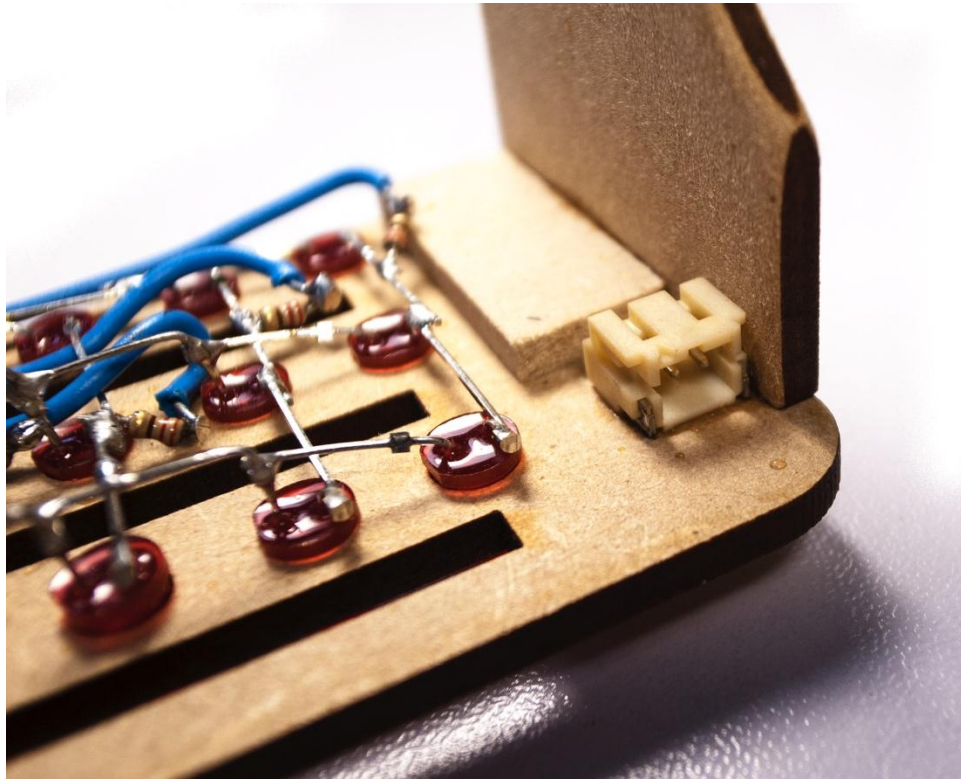


Figure 3.6: The JST female connector in place

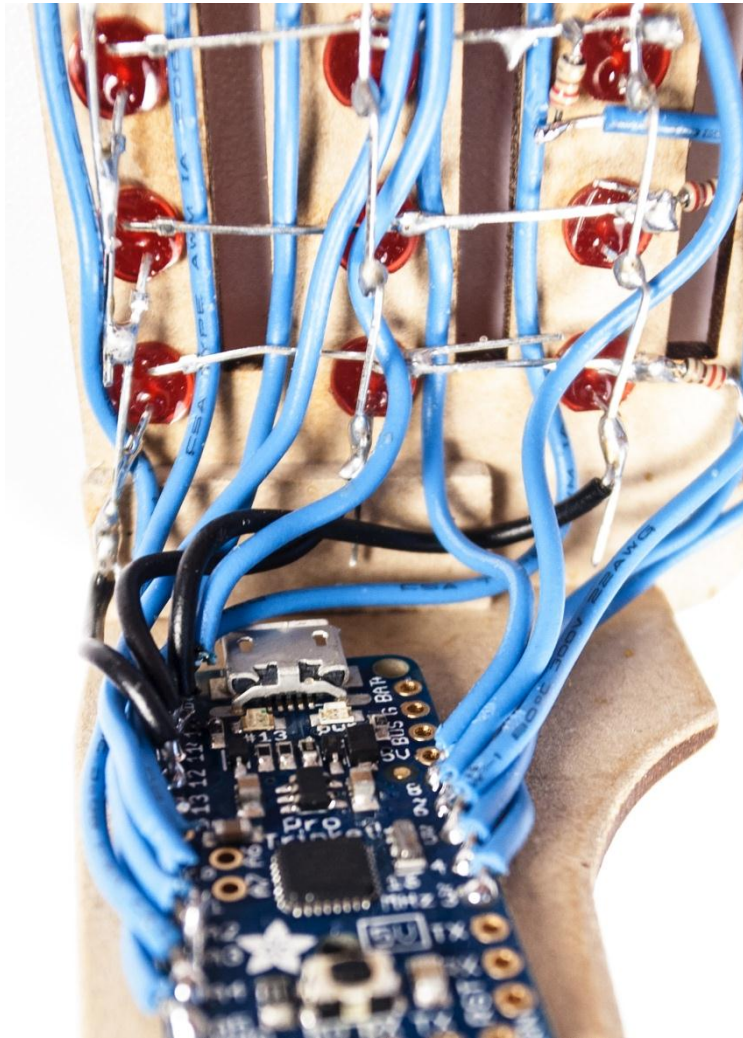


Figure 3.7: The Trinket board in place

Programming the glasses

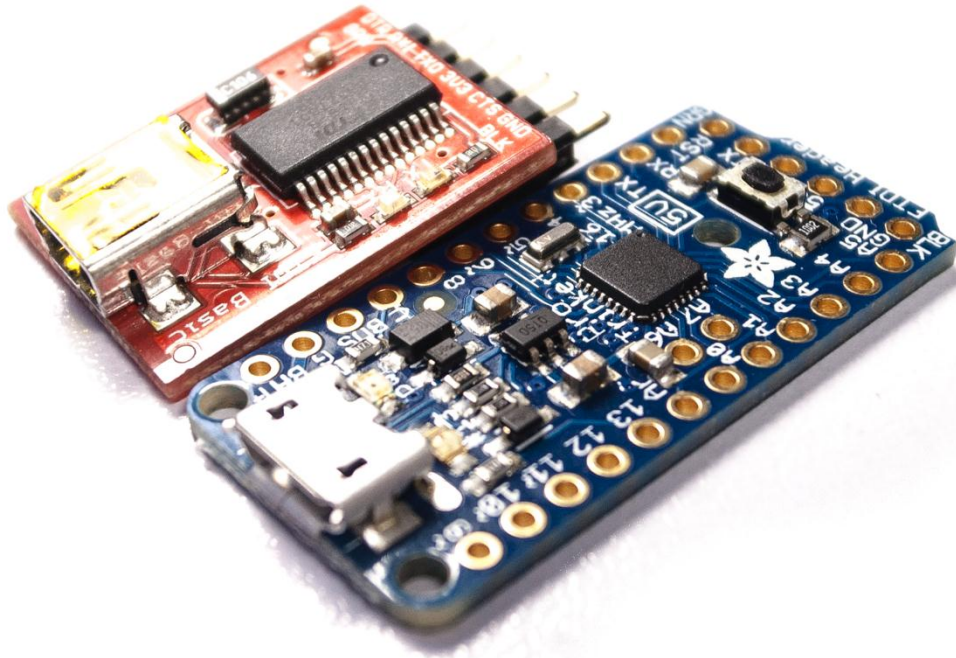


Figure 3.8: The FTDI serial to USB converter and the Trinket board

Finishing the glasses Knight Rider style

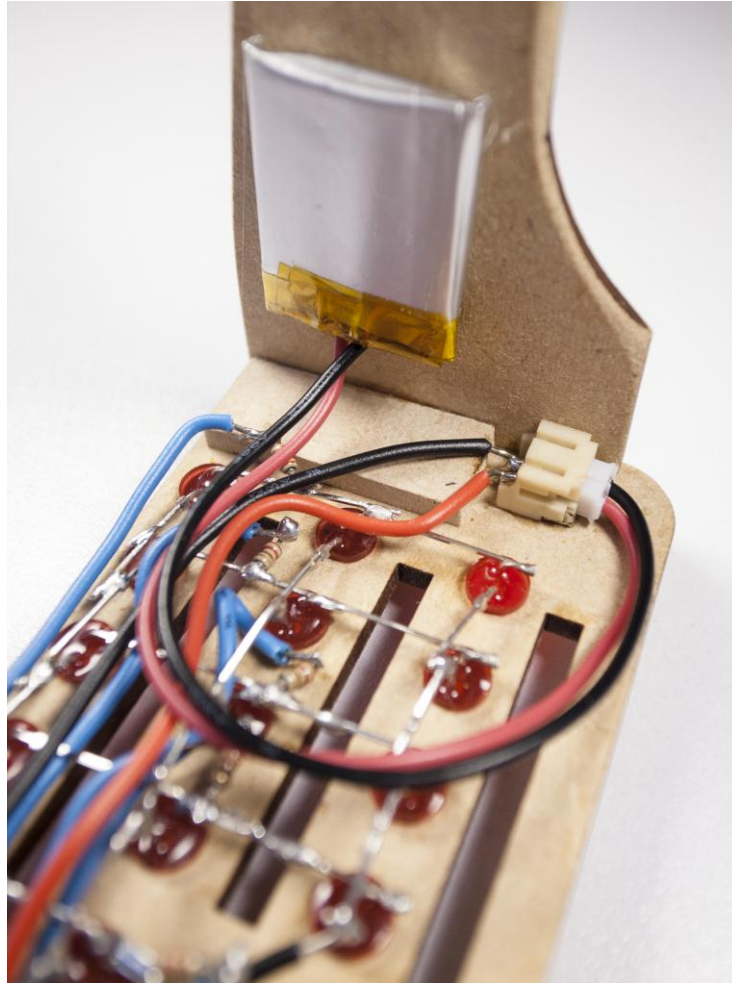


Figure 3.9: Battery connection

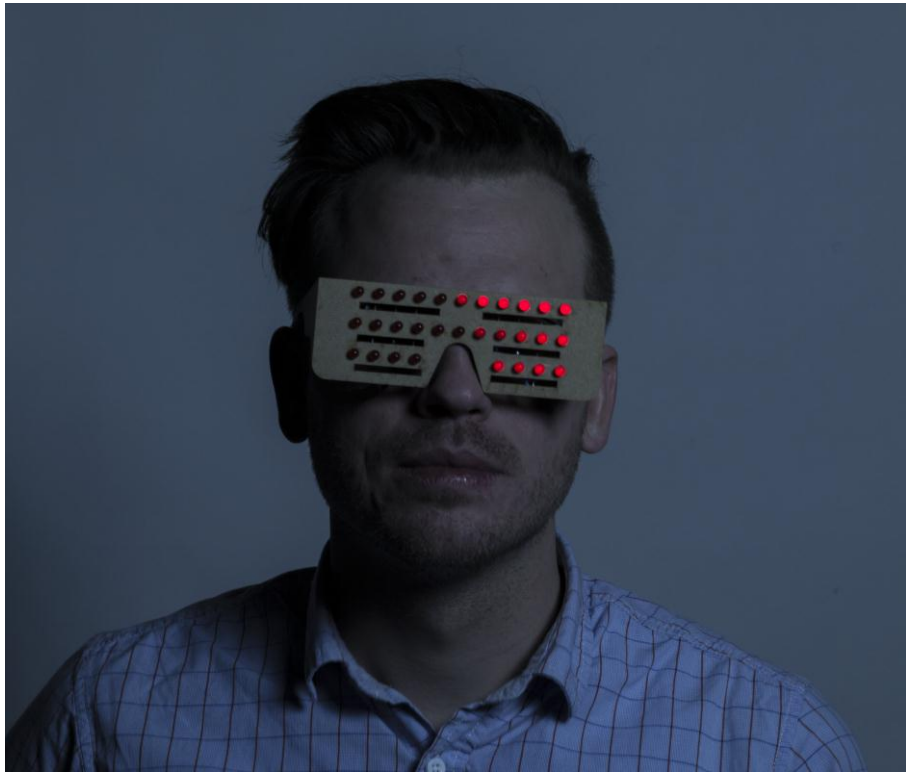


Figure 3.10: Johannes Nilsson showing off the LED glasses

Chapre 5: Where in the World am I?

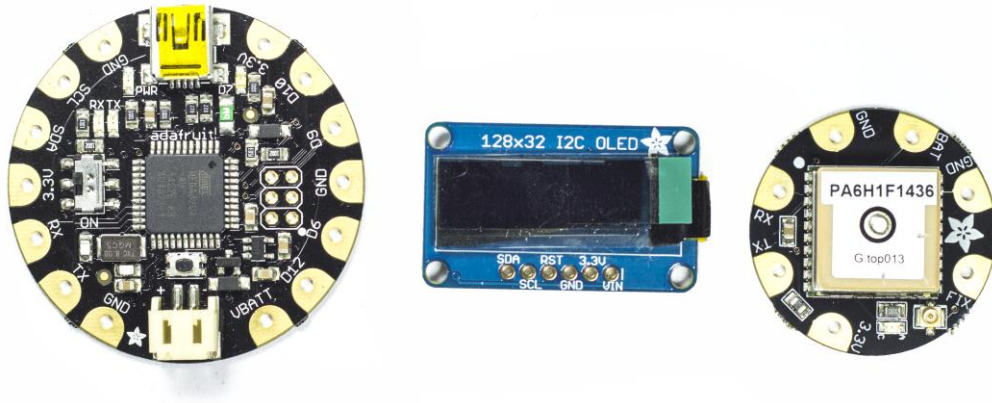


Figure 5.1: FLORA board, OLED and GPS

Hocking up the OLED screen

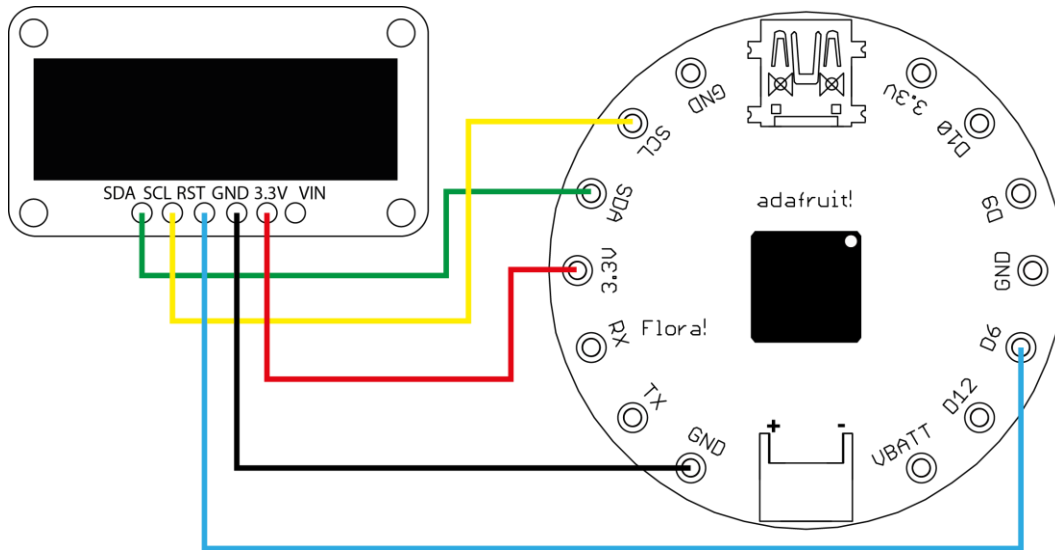


Figure 5.2: Connecting the OLED to the FLORA board

Getting the position

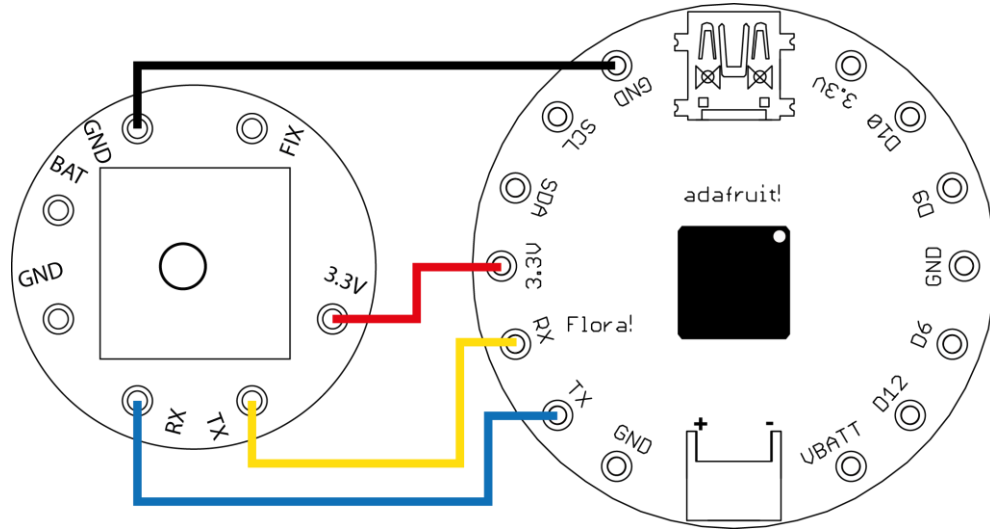


Figure 5.3: Connecting the GPS to the FLORA

Making the clock

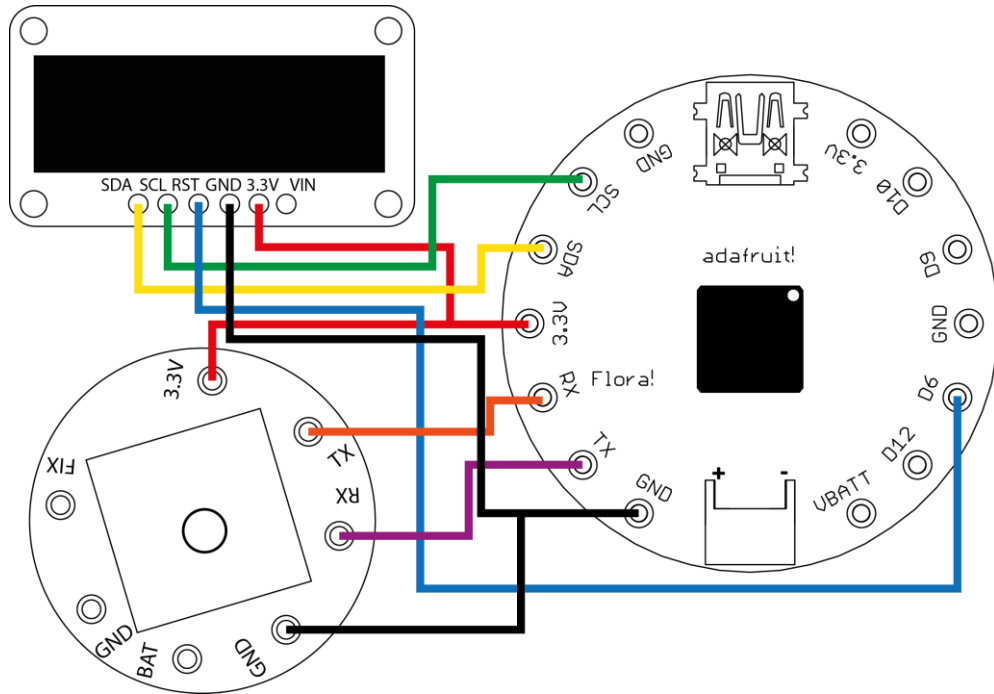


Figure 5.4: Connecting the GPS receiver and OLED screen to the FLORA board

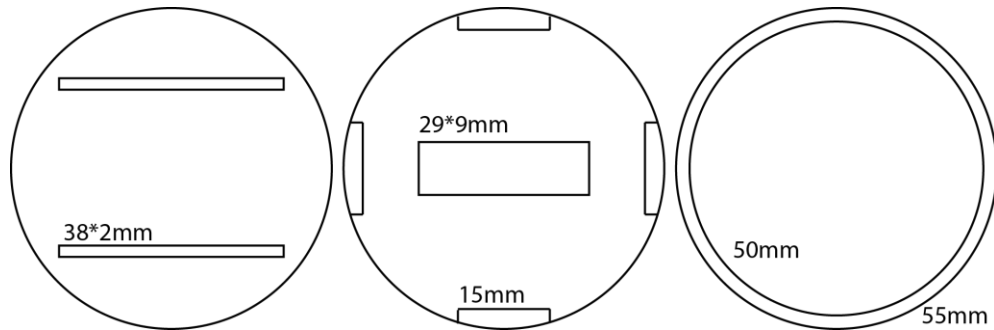


Figure 5.5: The watch design



Figure 5.6: All the cut pieces

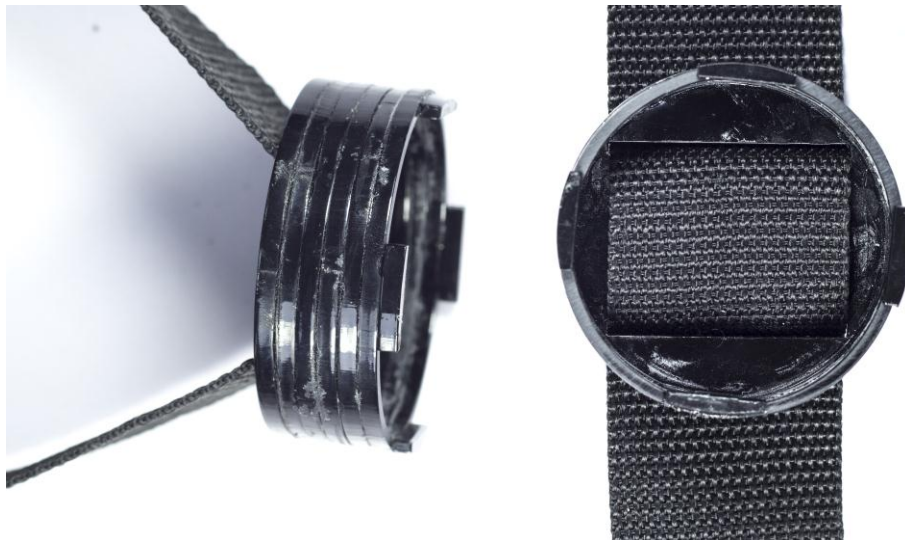


Figure 5.7



Figure 5.8: Attaching the OLED display

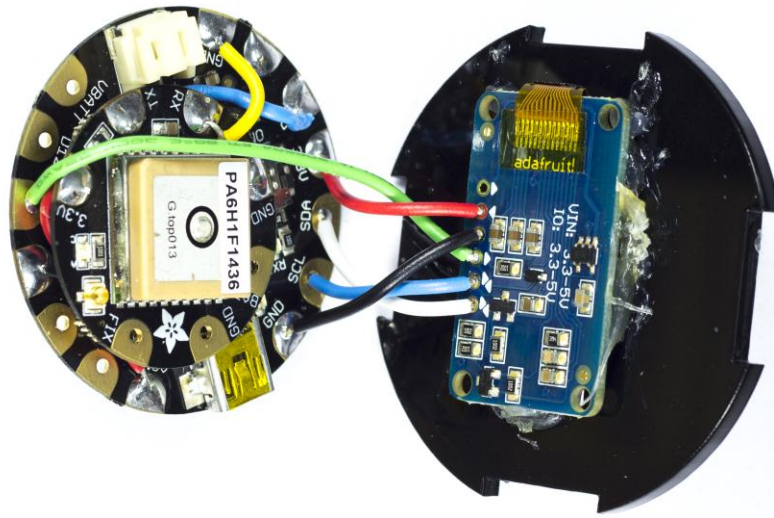


Figure 5.9: The FLORA board connected to the OLED screen

The final sketch

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Figure 5.10: The final result

Chapter 6: Hands-on with NFC

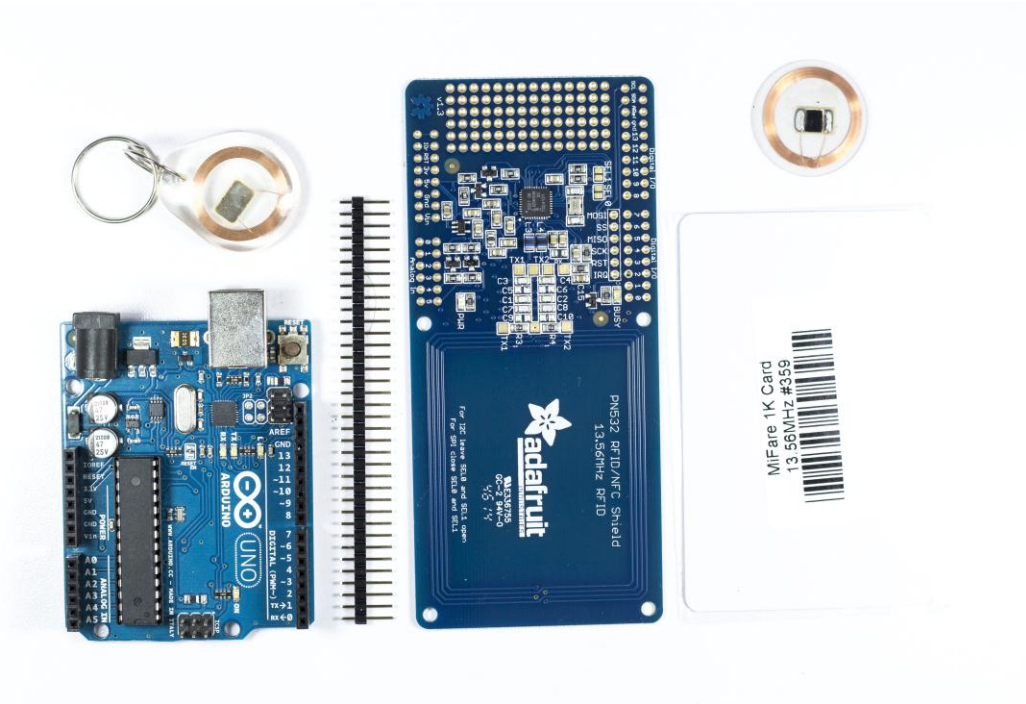


Figure 6.1: The Arduino UNO, Adafruit NFC shield, Mifare 1K NFC tags and cards

Reading a card

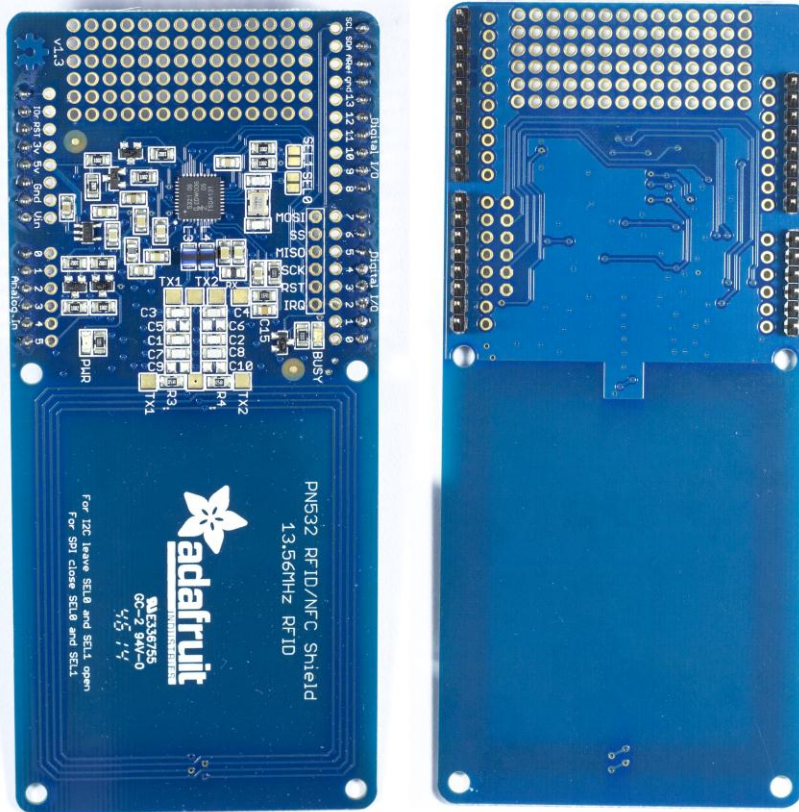


Figure 6.2; The pins solder into place on the NFC shield

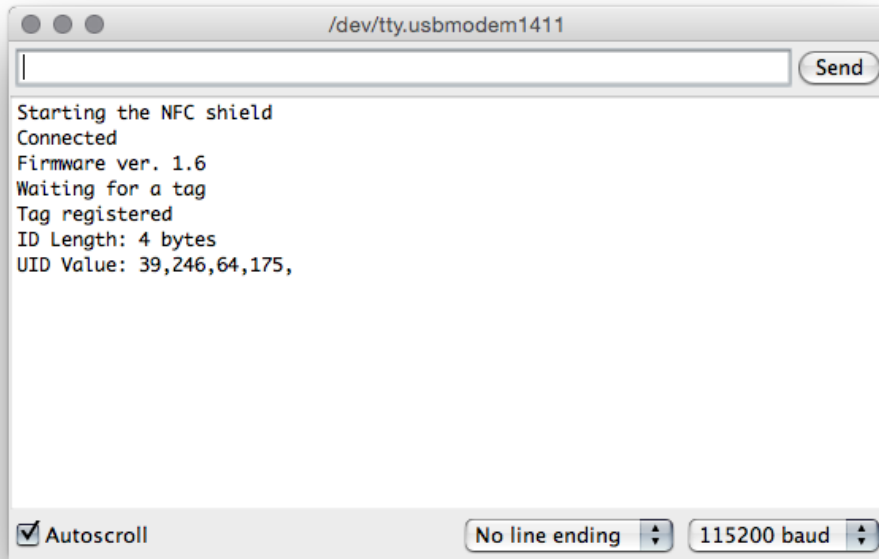


Figure 6.3: The serial monitor output

Connecting the motor

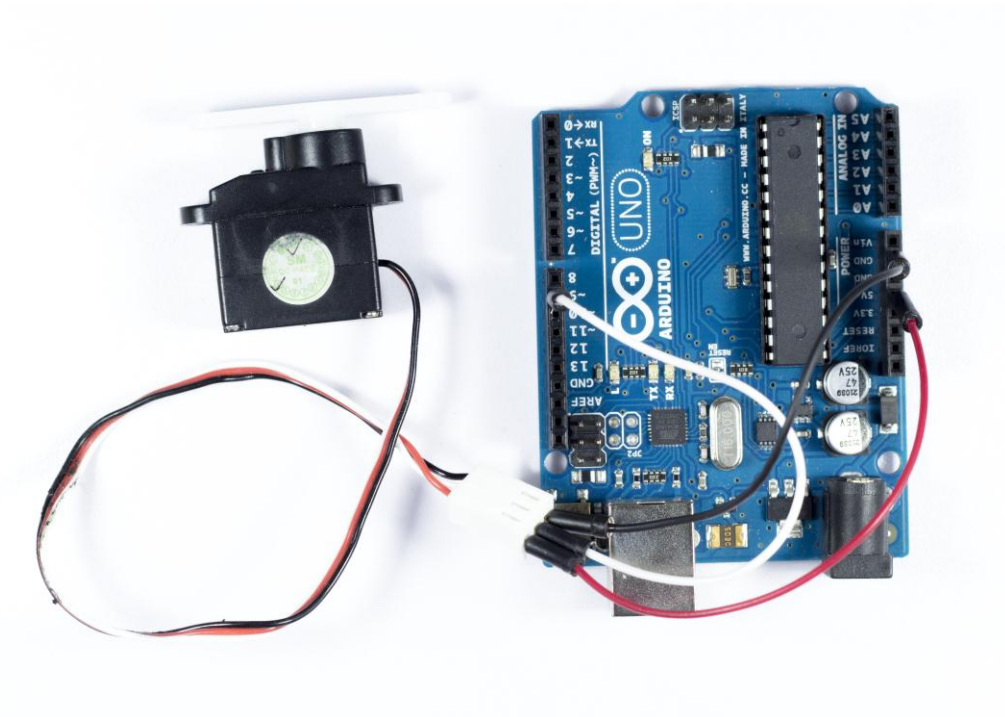


Figure 6.4: The servomotor connected to the Arduino Uno

Putting the pieces together

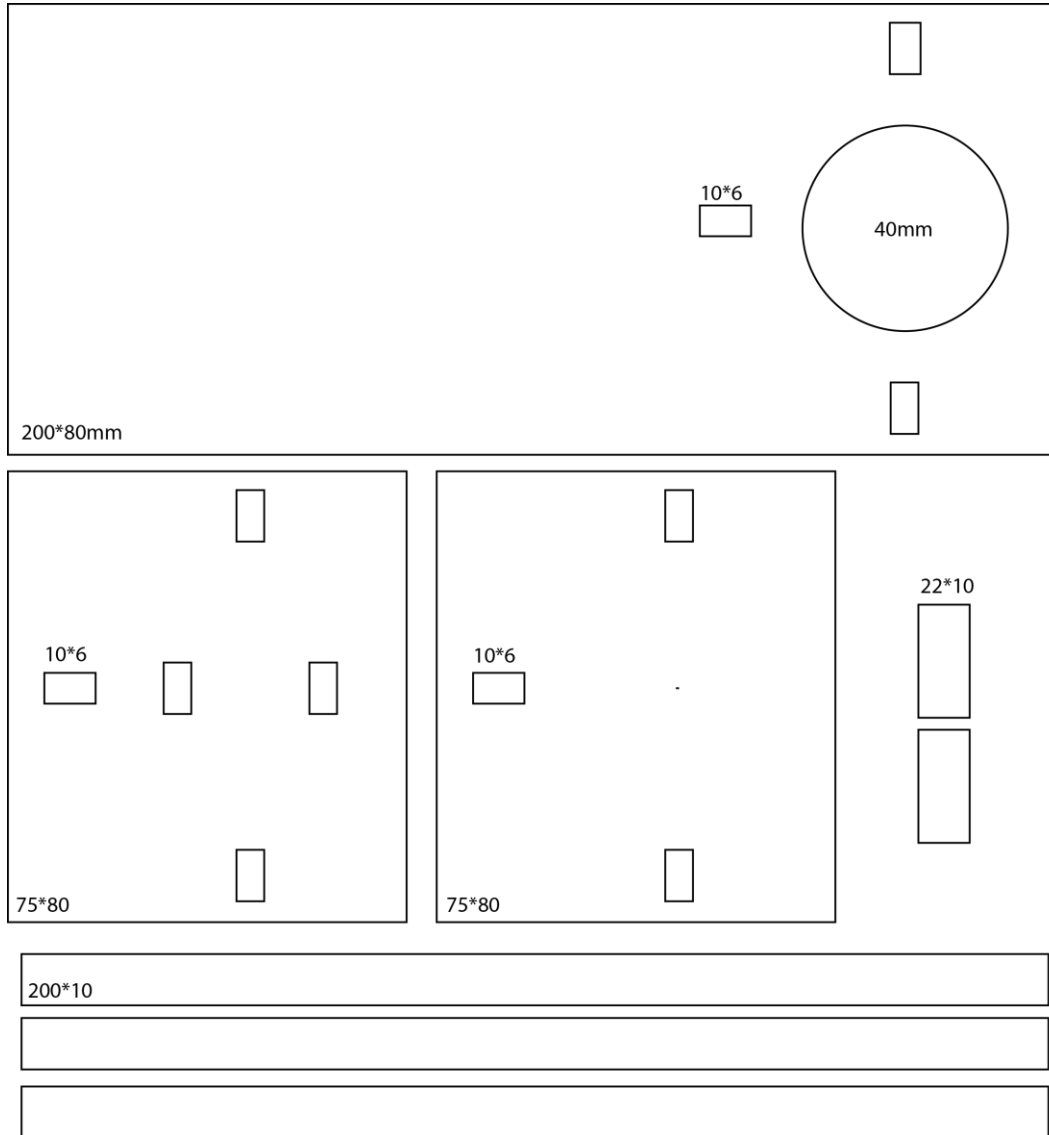


Figure 6.5: The cutting measurements for all the part

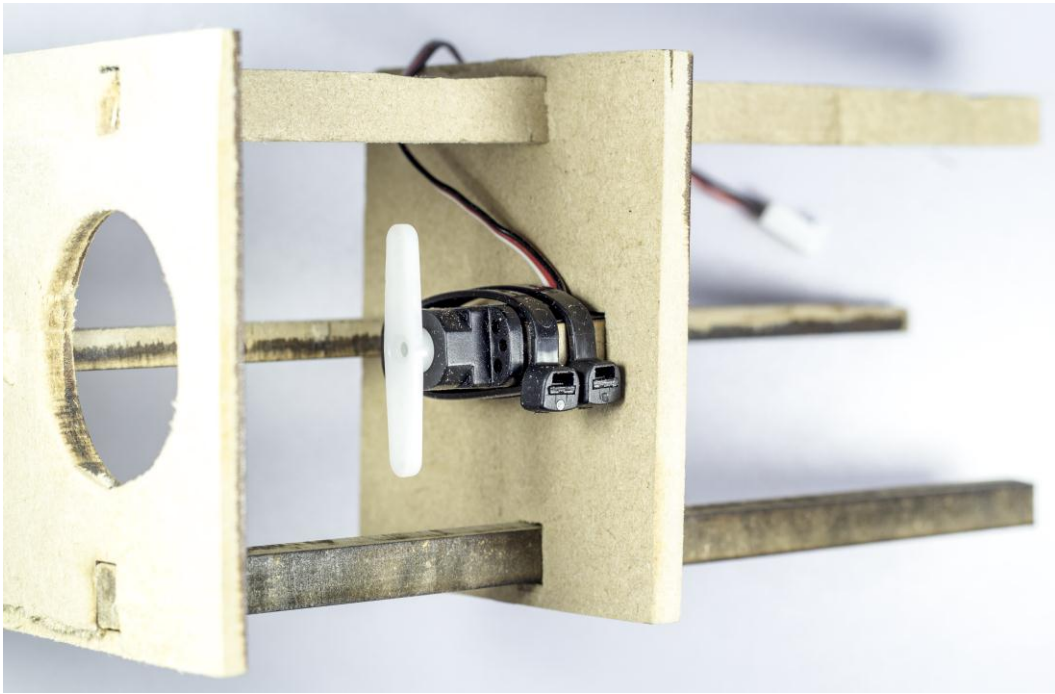


Figure 6.6: The motor plate in place together with the base plate

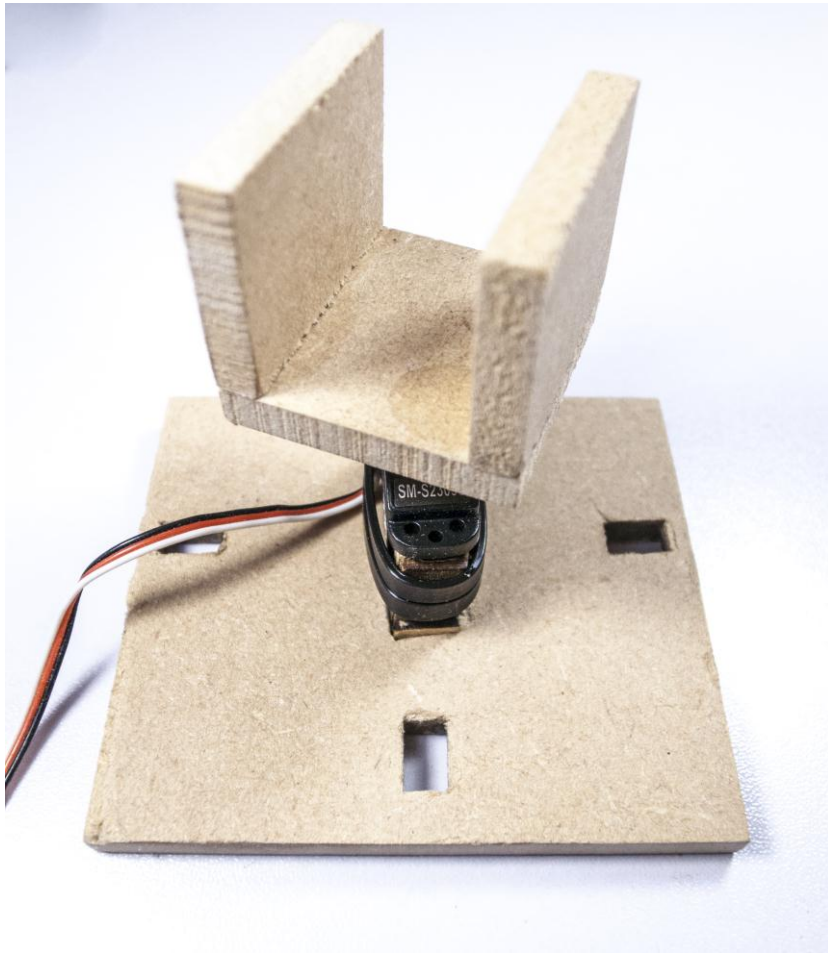


Figure 6.7: The "claw" attached to the servomotor



Figure 6.8: The final door lock in place

The final code



Figure 6.9: Wooden NFC ring

Chapter 7: Hands on BLE

Hello Blend Micro

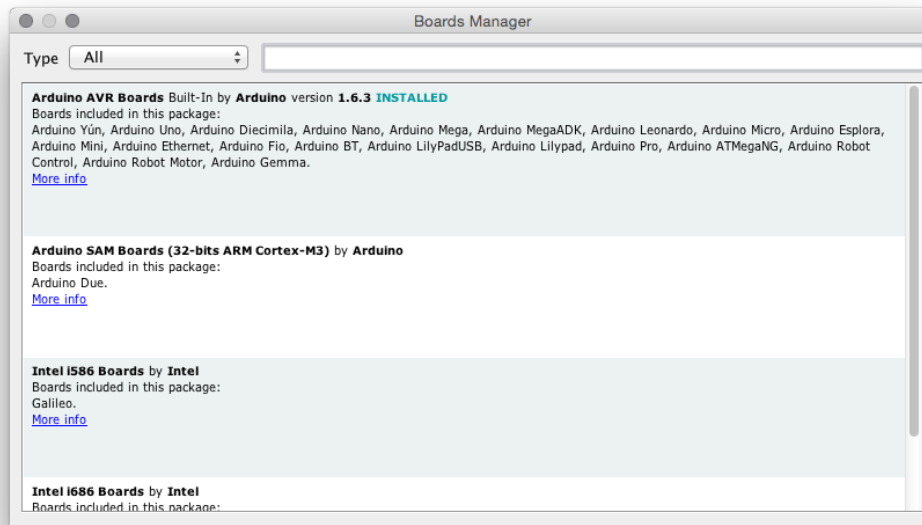


Figure 7.1: The Board manager

The Blend Micro app

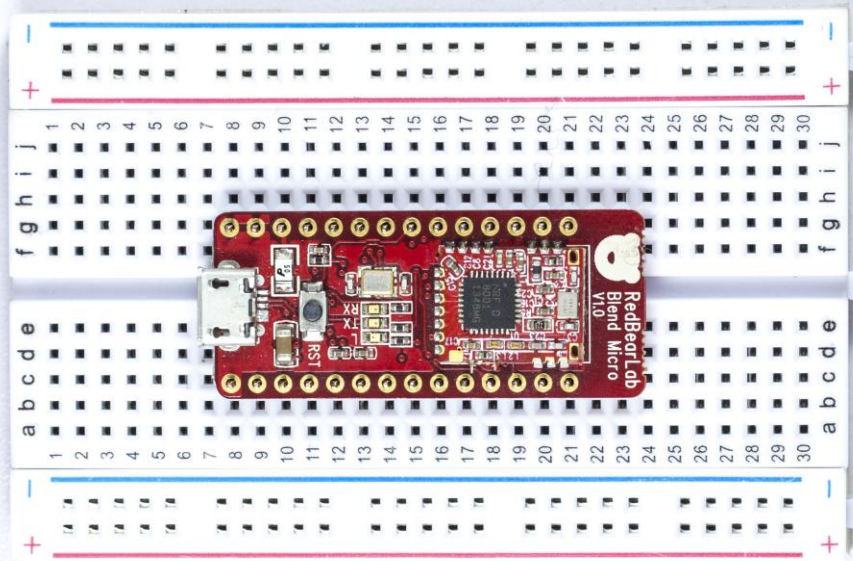


Figure 7.2: The Blend Micro attached to the breadboard

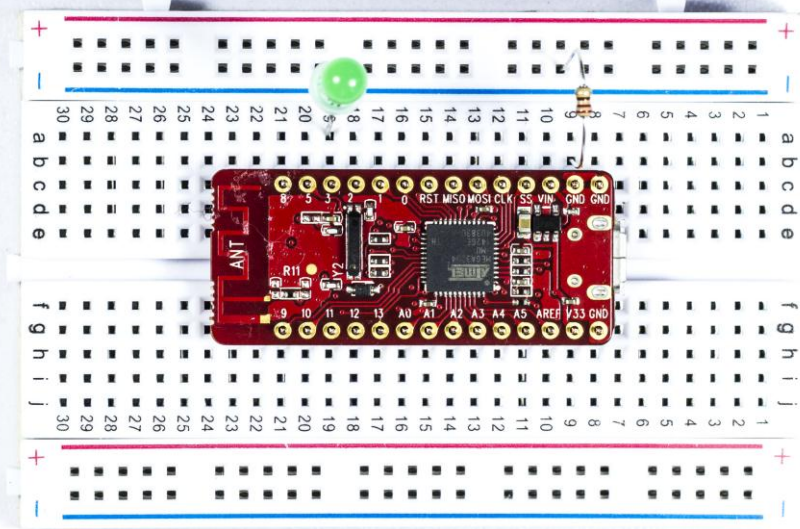


Figure 7.3: LED and resistor connected to the breadboard

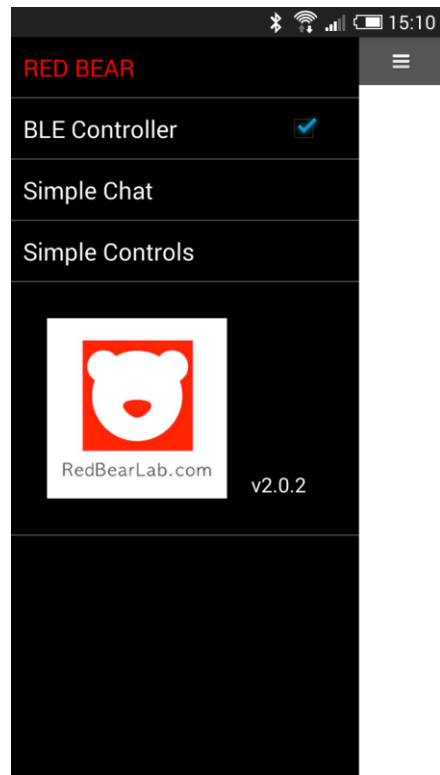


Figure 7.4: BLE controller app menu

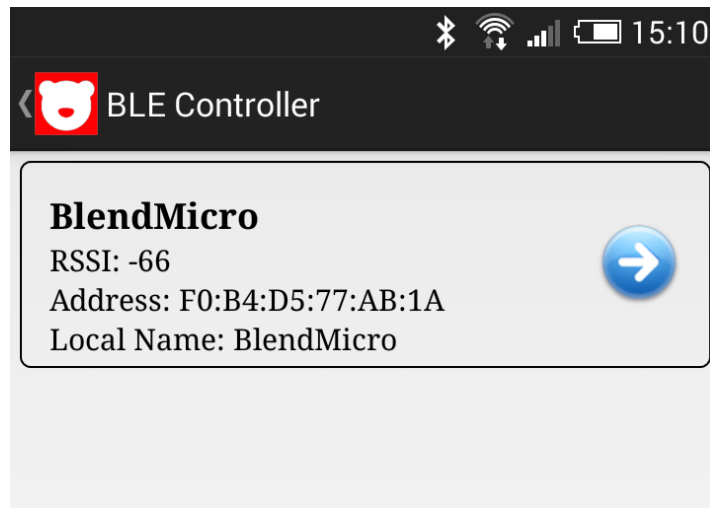


Figure 7.5: Scanning for BLE devices

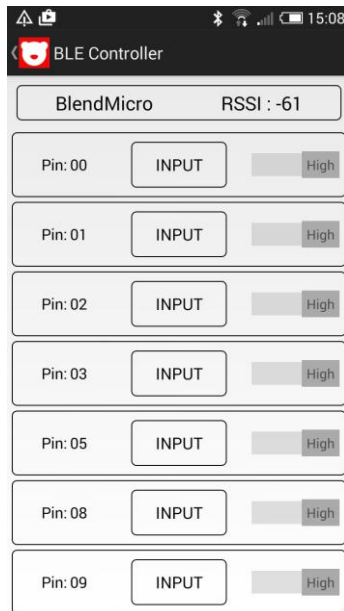


Figure 7.6: Options for direct pin control

Gesture tracking

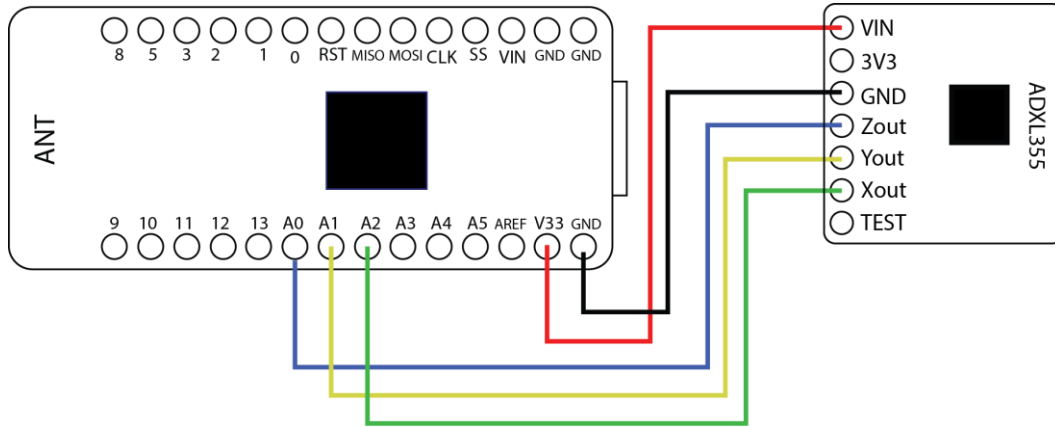


Figure 7.7: The ADXL355 connected to the Blend Micro

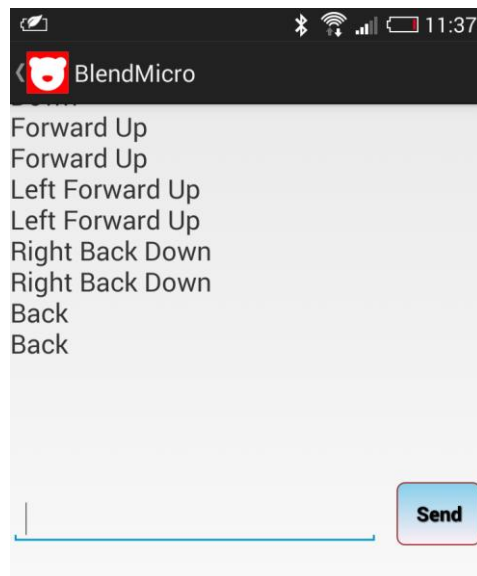


Figure7.8: The app printout from the accelerometer

Wrapping things up



Chapter 8: On the Wi-fly

The Particle Core

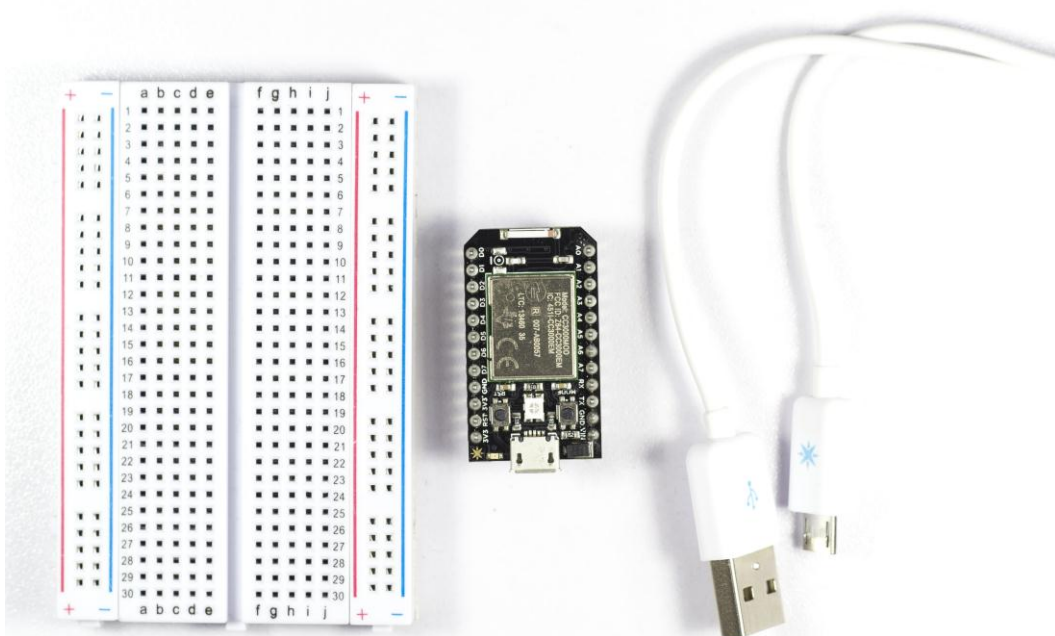


Figure 8.1: The Particle Core starter kit

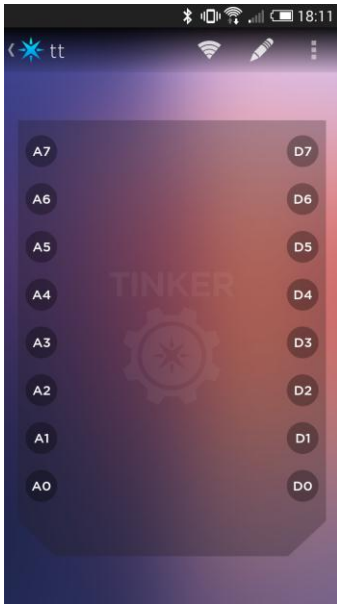


Figure 8.2 The Tinker screen in the core app

Programming for the Particle Core

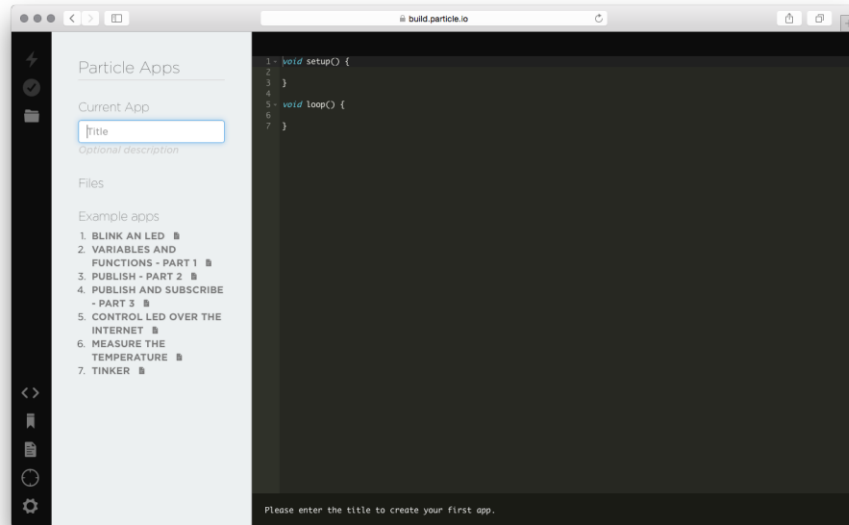


Figure 8.3: The web IDE



Figure 8.4: The IDE menu buttons

The Dashboard

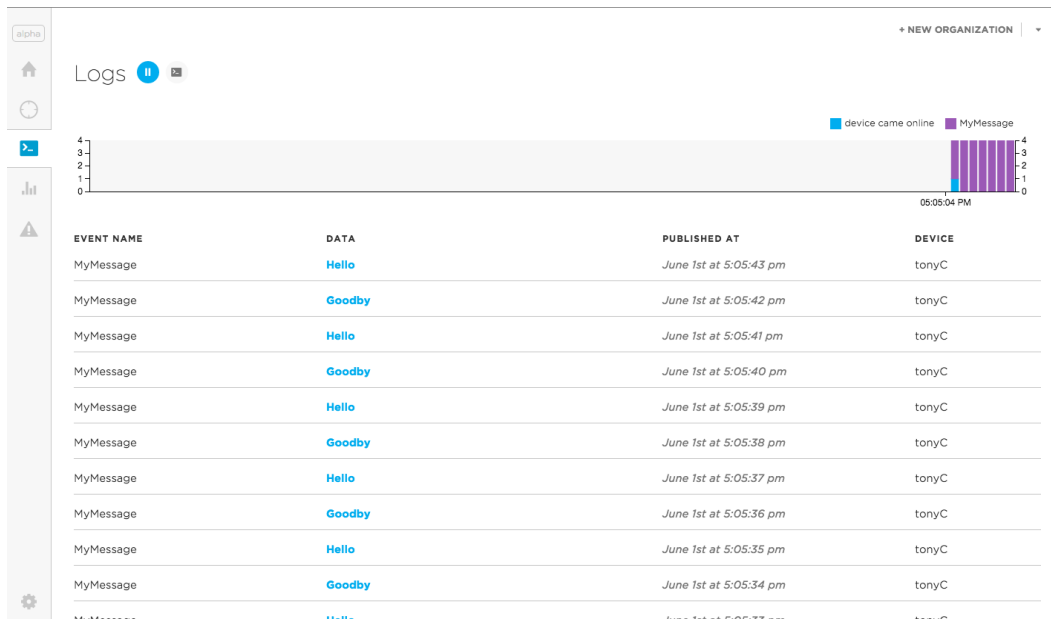
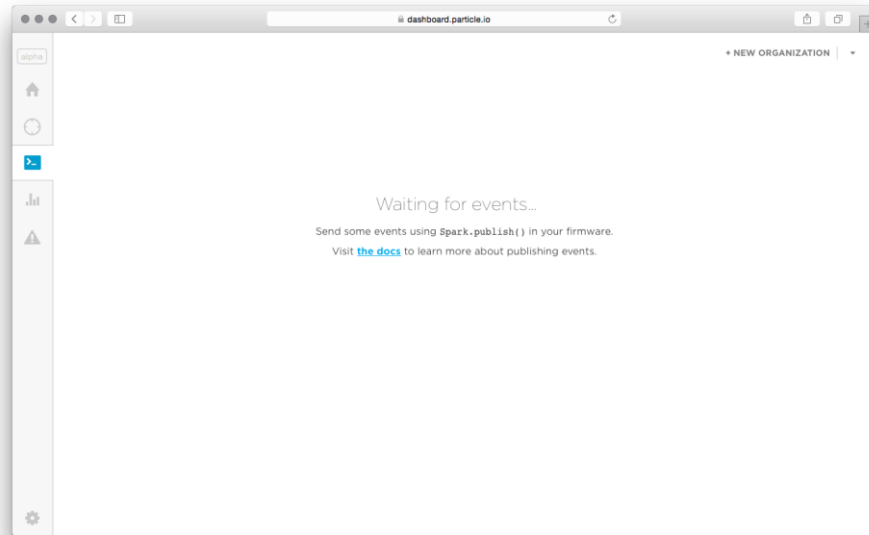


Figure 8.6 Receiving data in the dashboard

HTML control

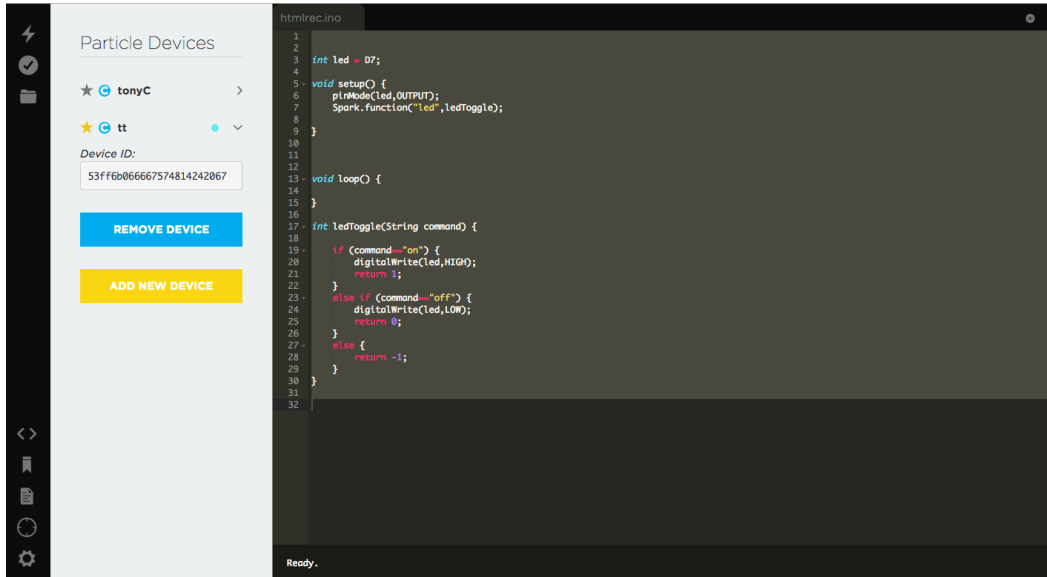


Figure 8.7 The device menu

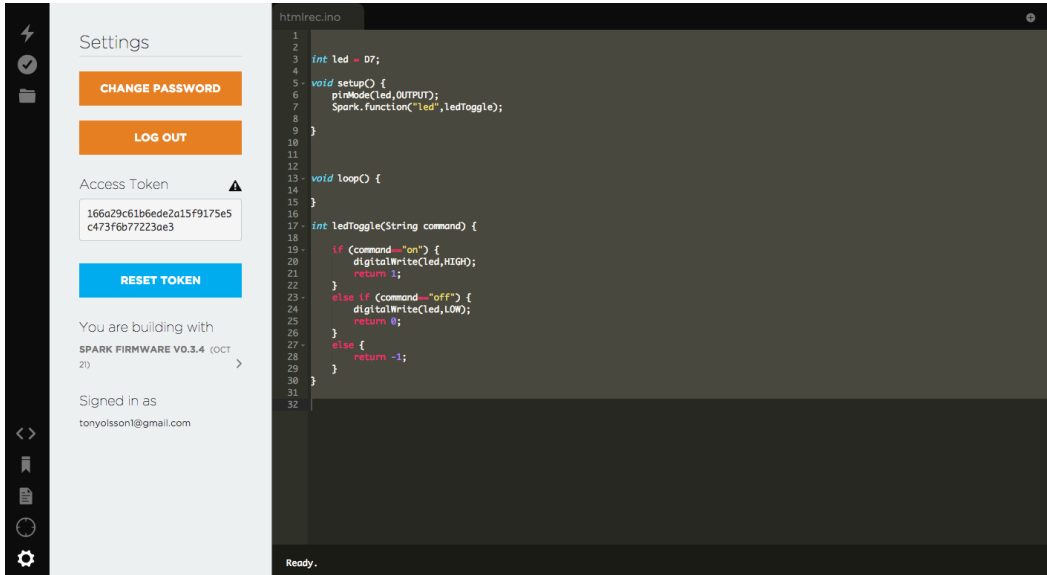


Figure 8.8: The settings menu where you can find the access token

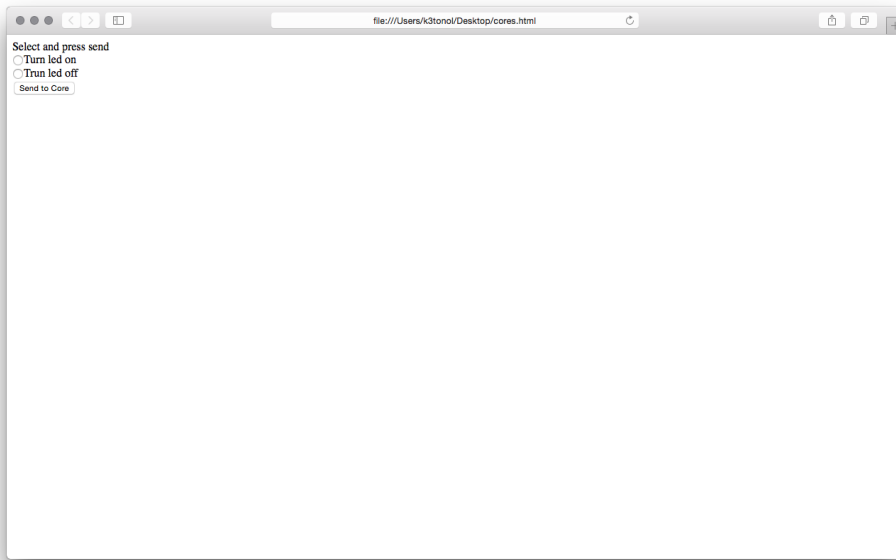


Figure 8.9: A simple HTML web page with control options

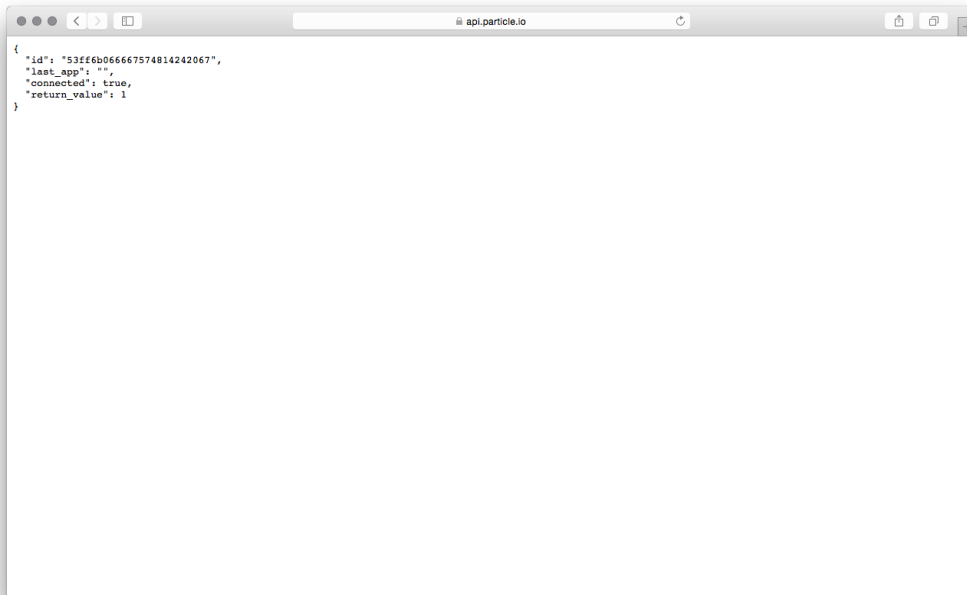


Figure 8.10 Respond message from the Core board

Connecting to IFTTT

Monitoring data changes

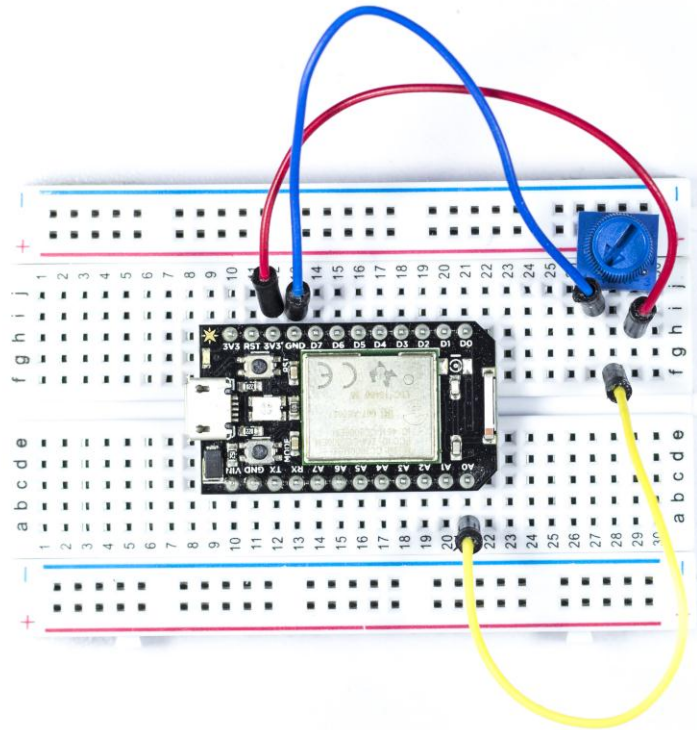


Figure 8.11: Connecting a potentiometer to the Core board

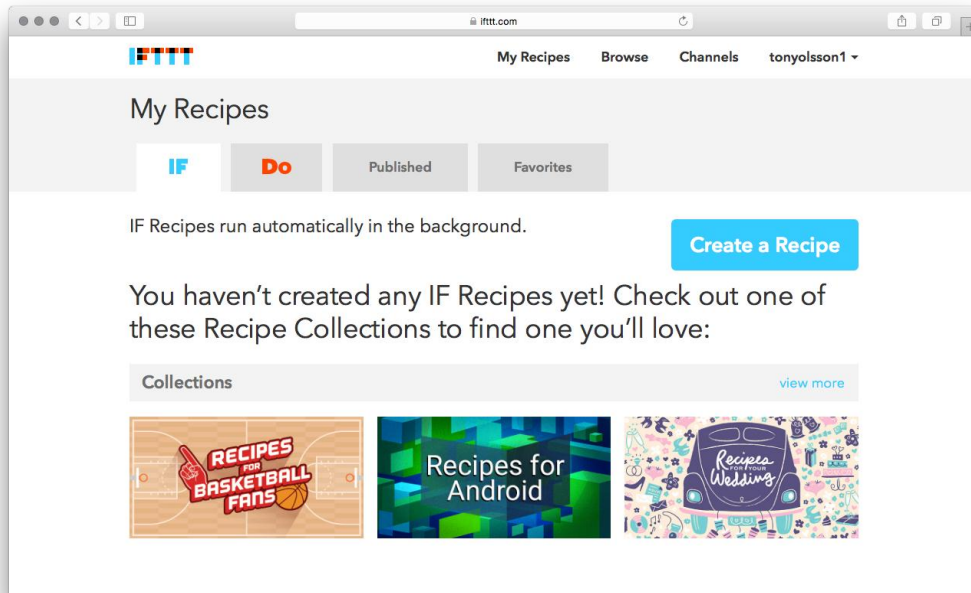


Figure 8.12: The IFTTT website

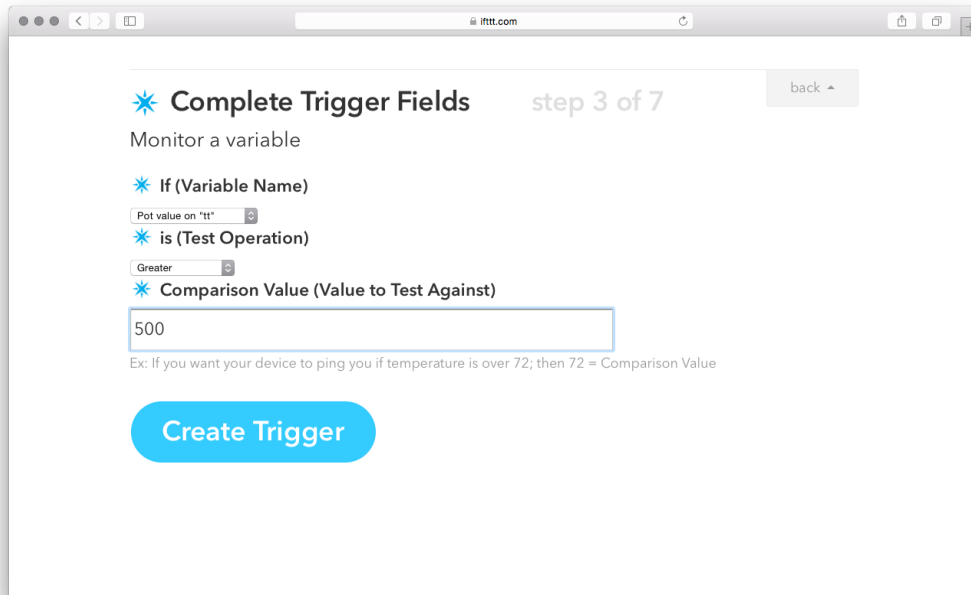


Figure 8.13: Creating the trigger for the recipe

:

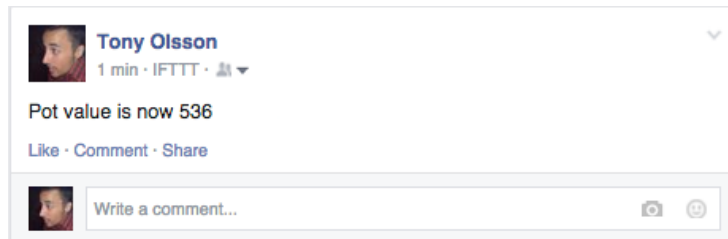


Figure 8.14: Status update made from the potentiometer value

DO a function

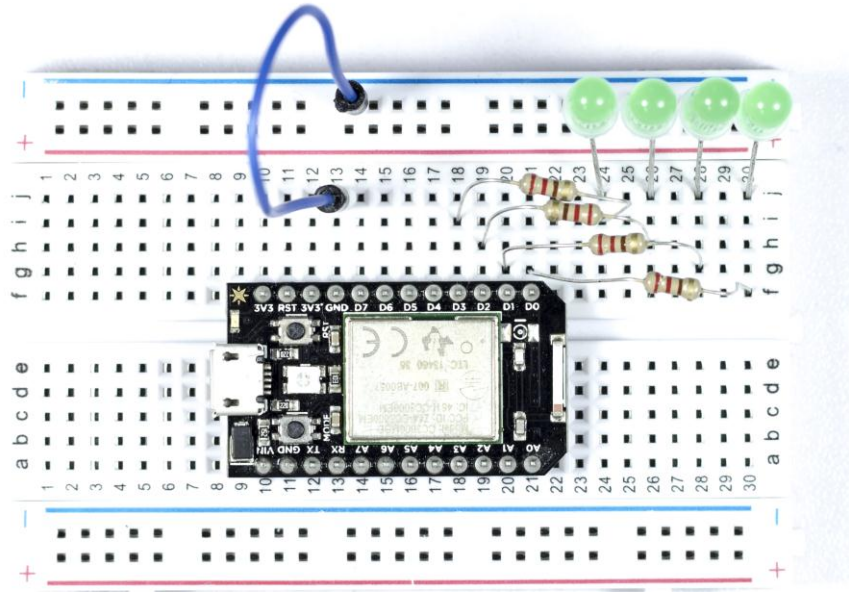


Figure 8.15: Connecting the LEDs and resistors

Chapter 9: Time to Get Smart

Components

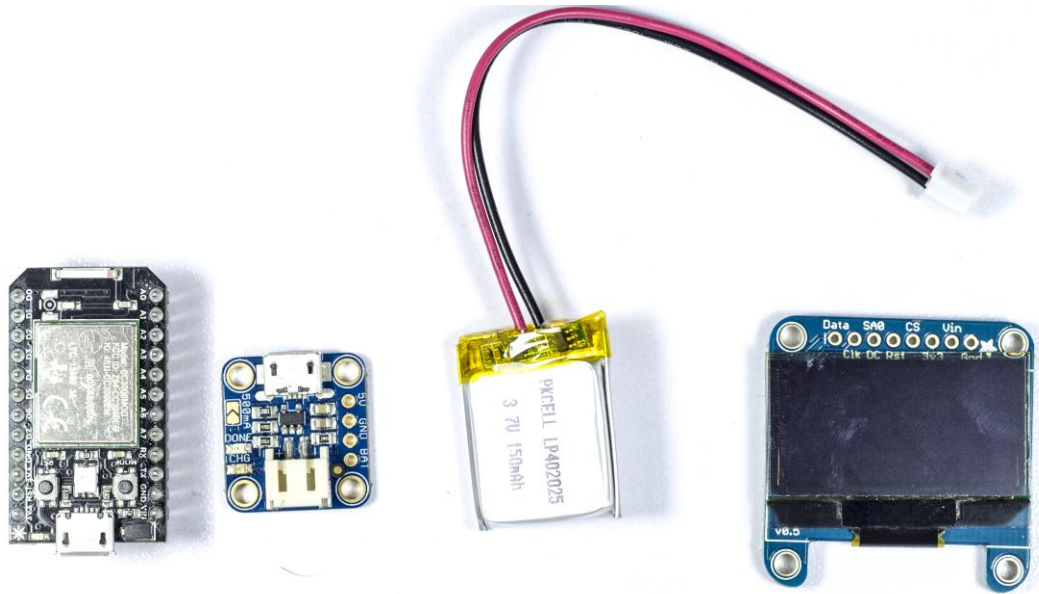


Figure 9.1: Components needed for the smart watch

Let's get started

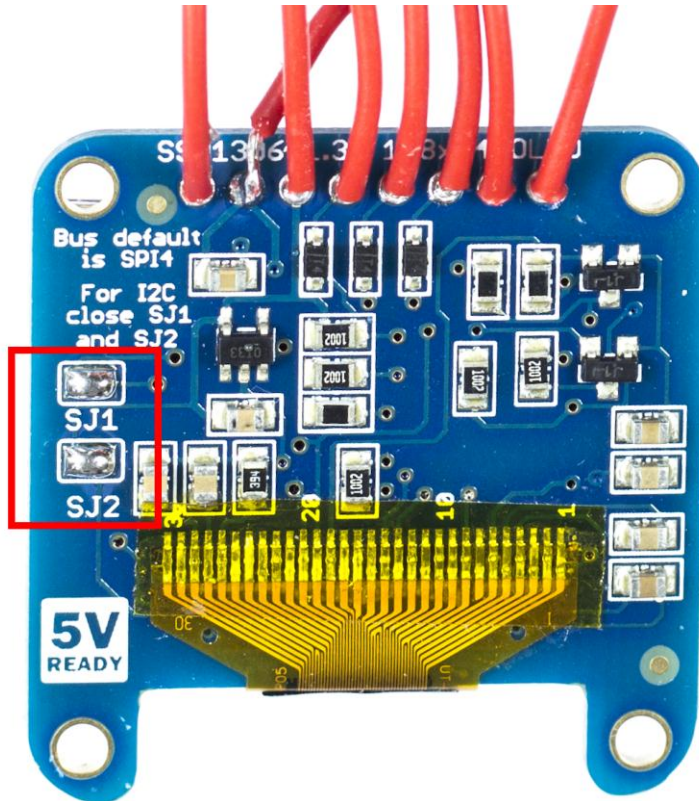


Figure 9.2: Soldering the SJ1 and SJ2 pad together

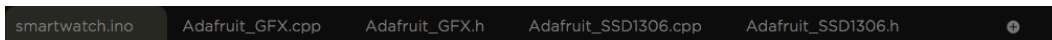


Figure 9.3: Manually adding libraries to the web IDE

Watch design and soldering

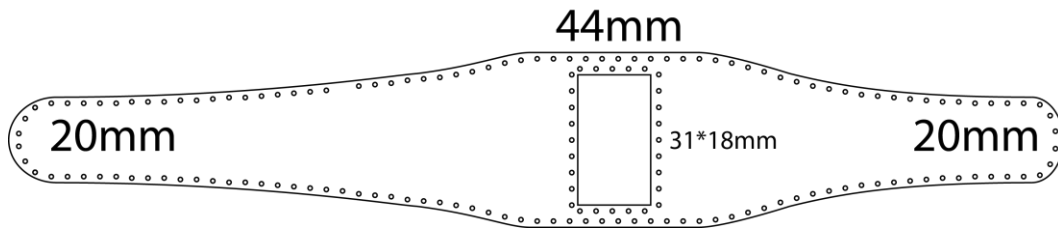


Figure 9.4: The template design for the watch strap



Figure 9.5: The cut template and a selection of leather types

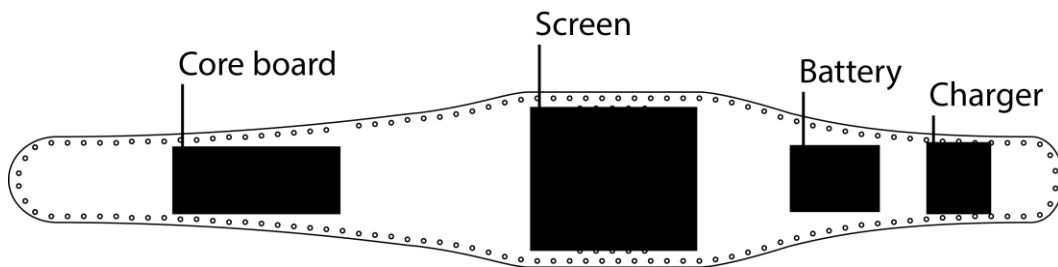


Figure 9.6: The placement of components on the watch template

Desoldering

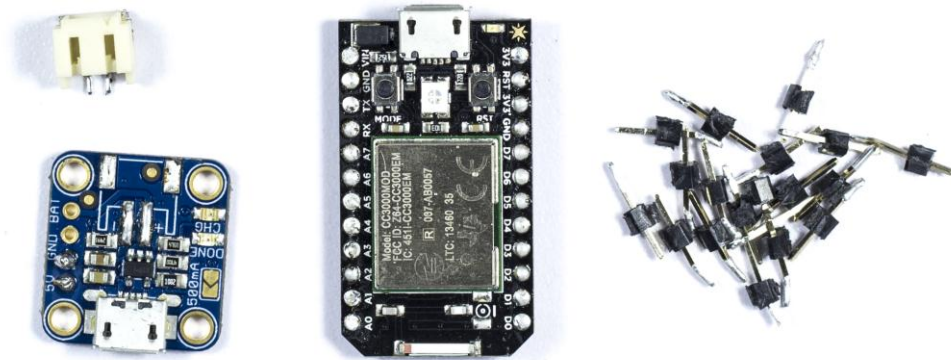


Figure 9.7: The JST connector and male pins desoldered

Connecting the pieces

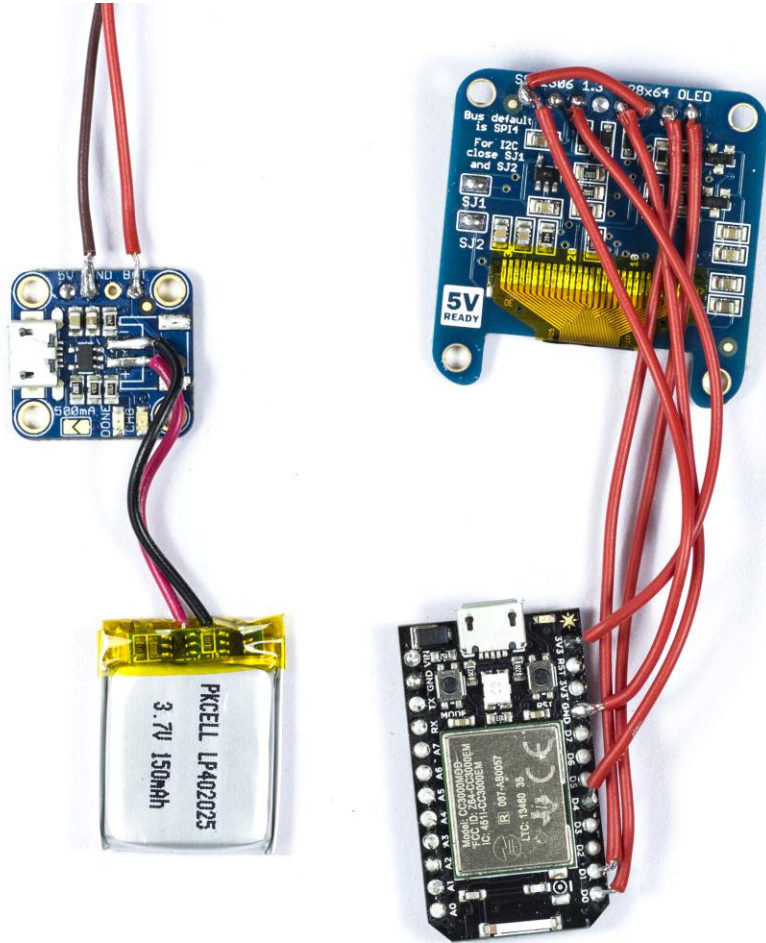


Figure 9.8: The battery and charging circuit soldered together with the screen and Core board

Leather time



Figure 9.9: Attaching the template to the piece of leather



Figure 9.10 Cutting a hole for the OLED screen

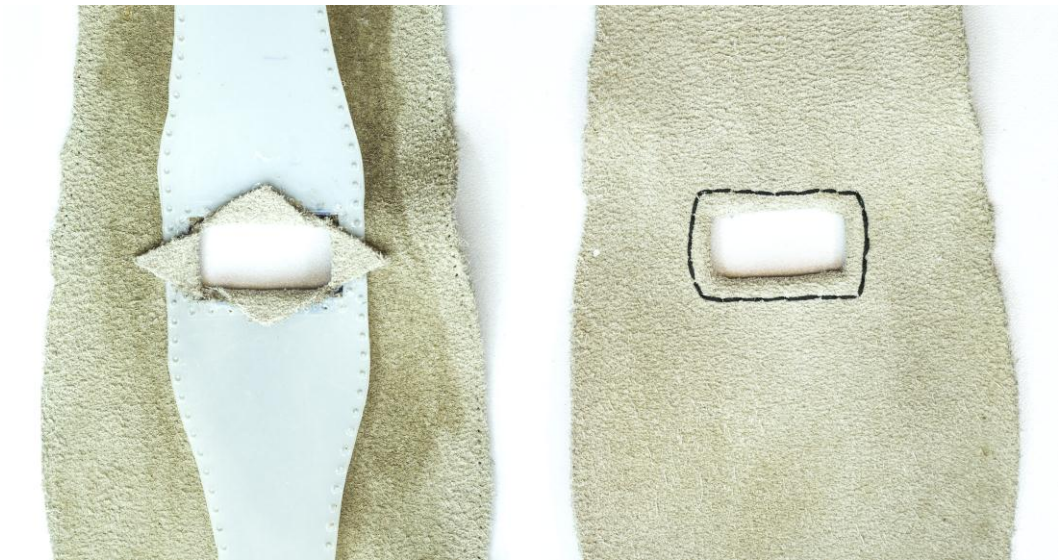


Figure 9.11: The flaps glued on the inside and the stitching around the screen from the outside

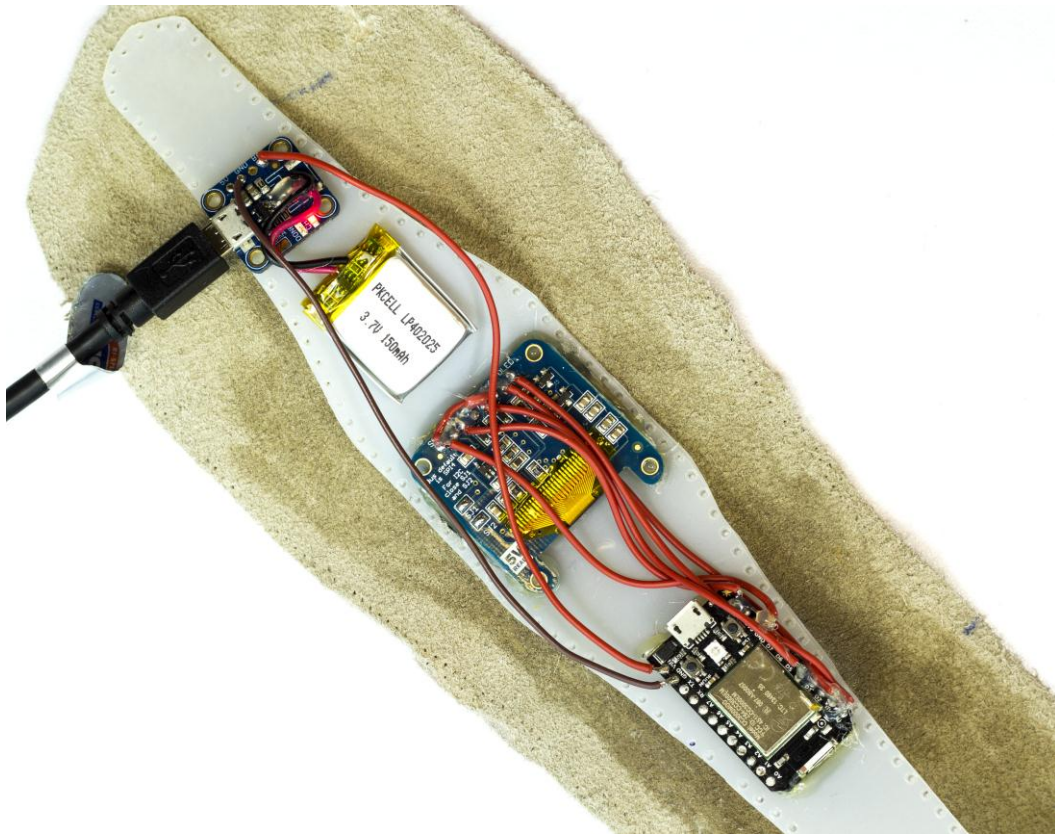


Figure 9.12: Checking the components once placed on to the template

Finishing up



Figure 9.13: Cutting a flap to hold the latch in place



Figure 9.14: Lining up the leather



Figure 9.15: Stitching around the edges of the watch

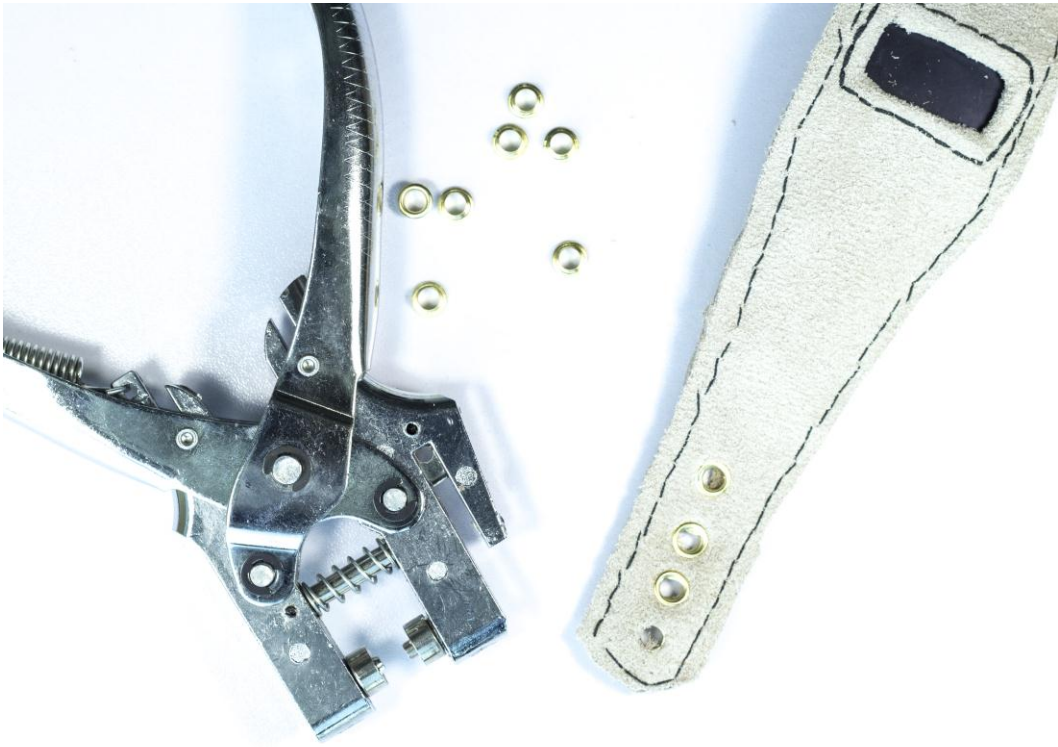


Figure 9.16: Attaching eyelets to the strap

Smorgasbord of functionality



Figure 9.17: The final watch result

Online Chapter: Interactive Name Tag

