Smart Turn

User Manual

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Requirements

Power source for Uno and Flora, peripherals wired according to the Hardware Wiring section of the Technical Guide.
A mobile phone running Android 8.1+ with Bluetooth turned on and connected to the Internet.

Installation

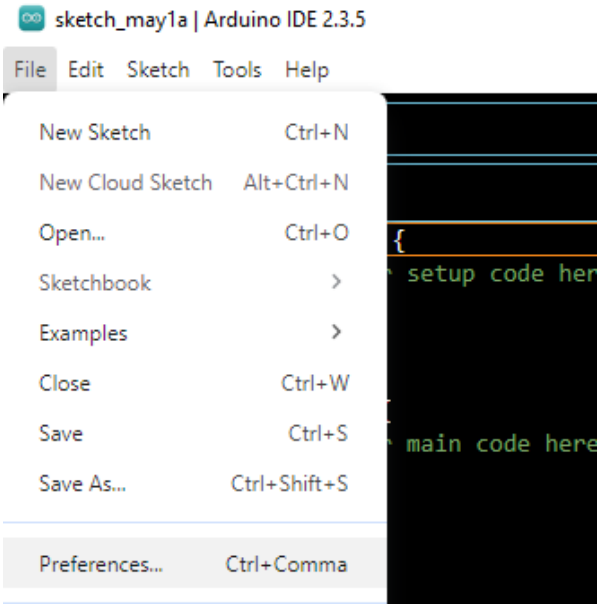
App

- App is currently built to an Android Phone
- Device must be in developer mode
- Allow USB Debugging
- Phone is connected via USB to laptop containing programme
- In directory 2025-csc1097-caseyj-24-czernij-2\src\smart_turn
- Flutter build apk
- Flutter install (Alternative: Flutter run)

Flora and Uno

The Flora and Uno do take more set-up than the app, firstly download the Arduino IDE from this Link. Make sure to get the right version for your operating system. Once installed, launch the IDE and follow these instructions to install the necessary libraries.

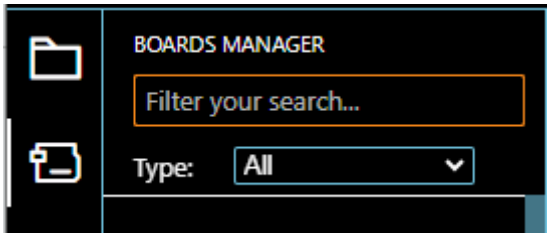
Press File in the top left corner of the screen and then press Preferences.



Scroll down in the preferences window and paste the following link into Additional Boards Manager URLs. Then press Ok.

https://adafruit.github.io/arduino-board-index/package_adafruit_index.json

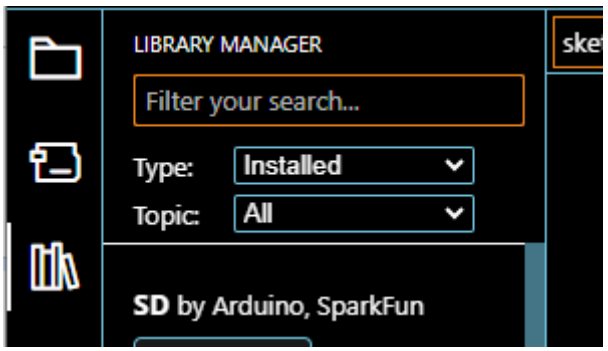
Open the board's manager by pressing the second icon on the left.



Install these packages.

- Arduino AVR Boards
- Adafruit AVR Boards

Once these are installed press the library manager which is the third icon on the left.

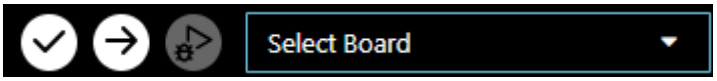


Install these libraries.

- SD
- Adafruit BluefruitLE nRF51
- Adafruit BusIO
- Adafruit GFX library
- Adafruit MPR121
- Adafruit NeoPixel
- Adafruit ST7735 and ST7789 Library
- Adafruit seesaw Library
- Adafruit Flora Pixel Library

Once all of these have been installed we can plug in the Flora and Uno to compile the code and put it onto the microcontrollers. Once Flora is connected via USB to a computer copy the code from: **src/flora/flora_led.ino**
Which can be found in our Gitlab Repo then remove any sample code in the IDE and paste our code in.

Select the Flora connection from this menu at the top of the IDE.



Once Selected press the Arrow beside the Select Board menu.

Now disconnect Flora and plug-in Uno, once again select the board using the menu just like for the Flora. Copy the code from: **src/arduino_blue/hc05_messages.ino**
Which can be found in our Gitlab Repo then remove any sample code in the IDE and paste our code in.
Press the Arrow beside the Select Board menu.
In both cases, the code should compile and load onto the hardware.

User Guide

App

Initial View

Upon opening the app and visiting the system the user is presented with a showing of a successful (Fig 1) or unsuccessful connection (Fig 2) to the device where they can then click try again to reconnect to the device. The user will also be presented with the two options of a textual input or an on tap map selection for choosing their desired destination.

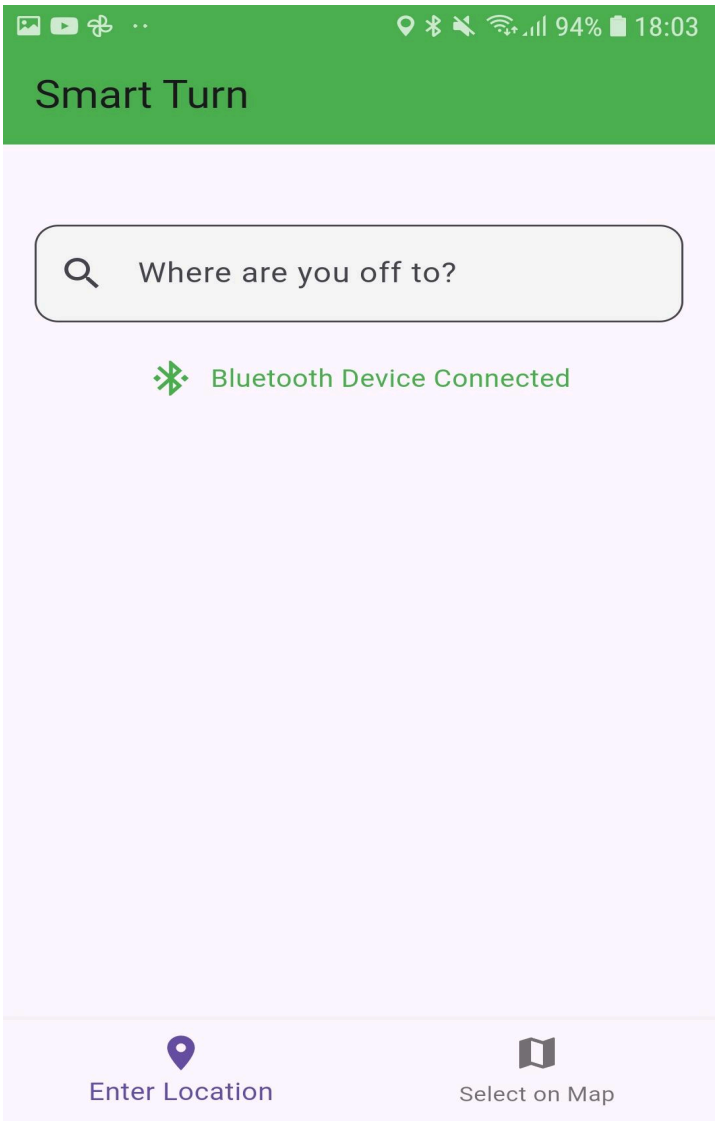


Fig1. Successful Connection

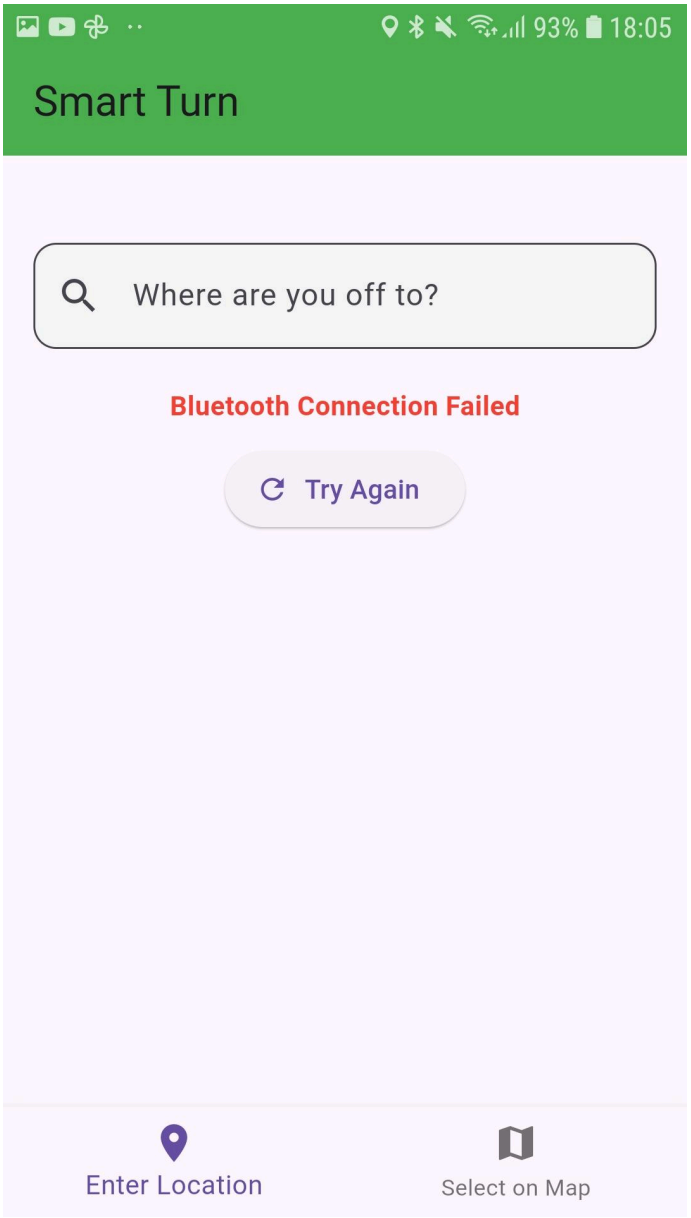


Fig2. Unsuccessful Connection

Map Tap

On tapping the location on the map the user is prompted with a confirmation of selection, selecting “Yes” if they have tapped their desired location or selecting “No” if it was an accidental input or slip of finger

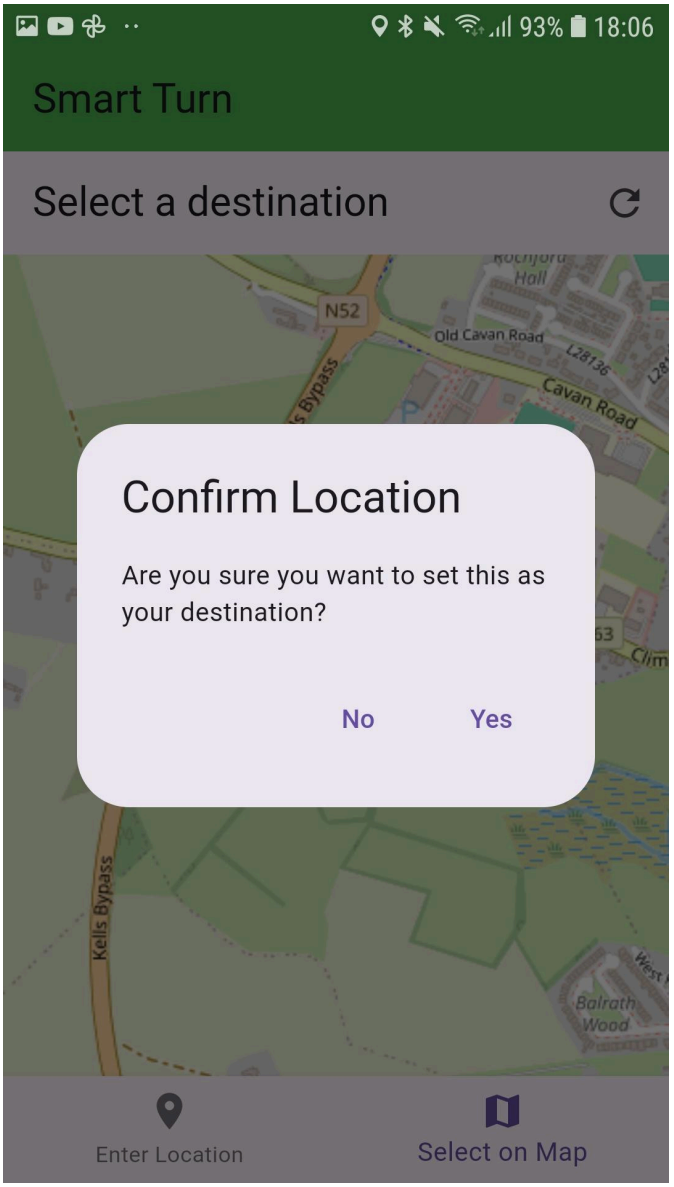


Fig3. Pop up bubble to confirm location

The route is then displayed after selecting “Yes” and data will now continue to be sent to the screen.

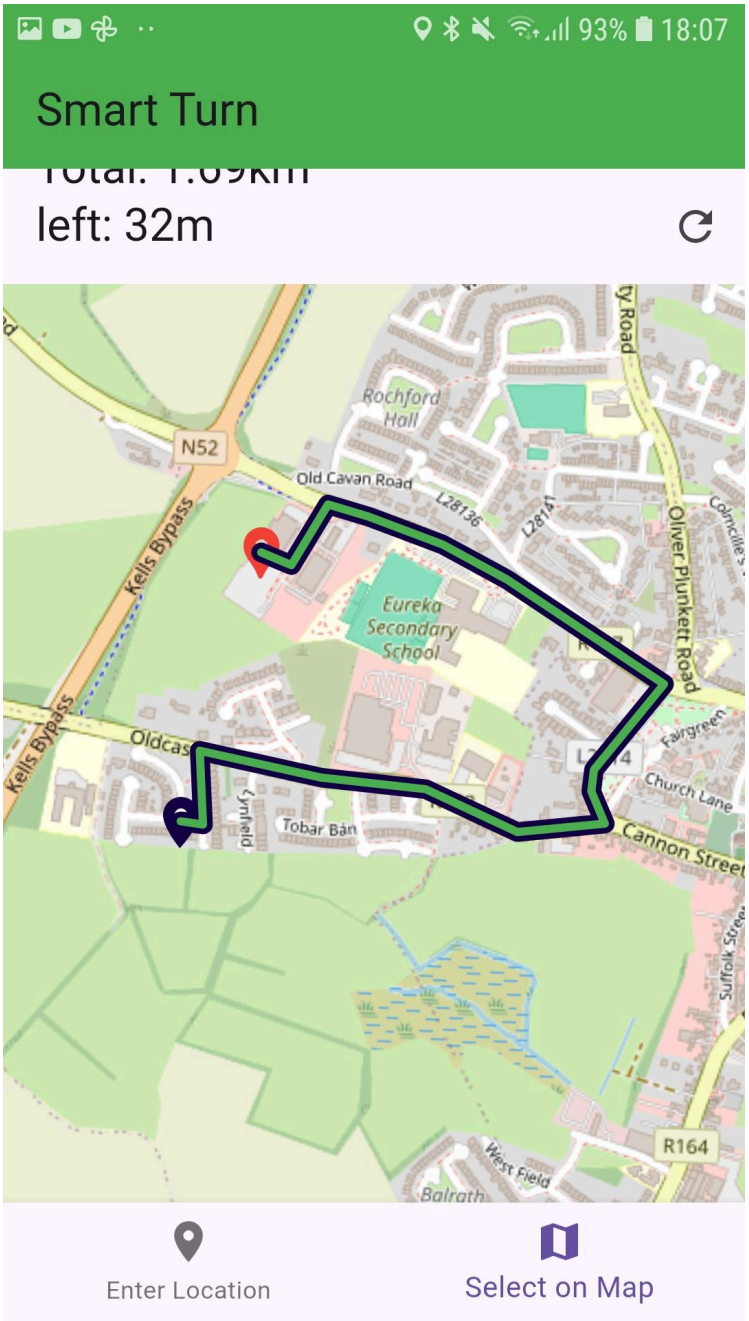


Fig4. Returned Route from Selecting “Yes”

Text Input

On selecting to input a location via text input the user will be prompted with autocomplete suggestions to where they can then select a choice to where then the system will route them to that location.

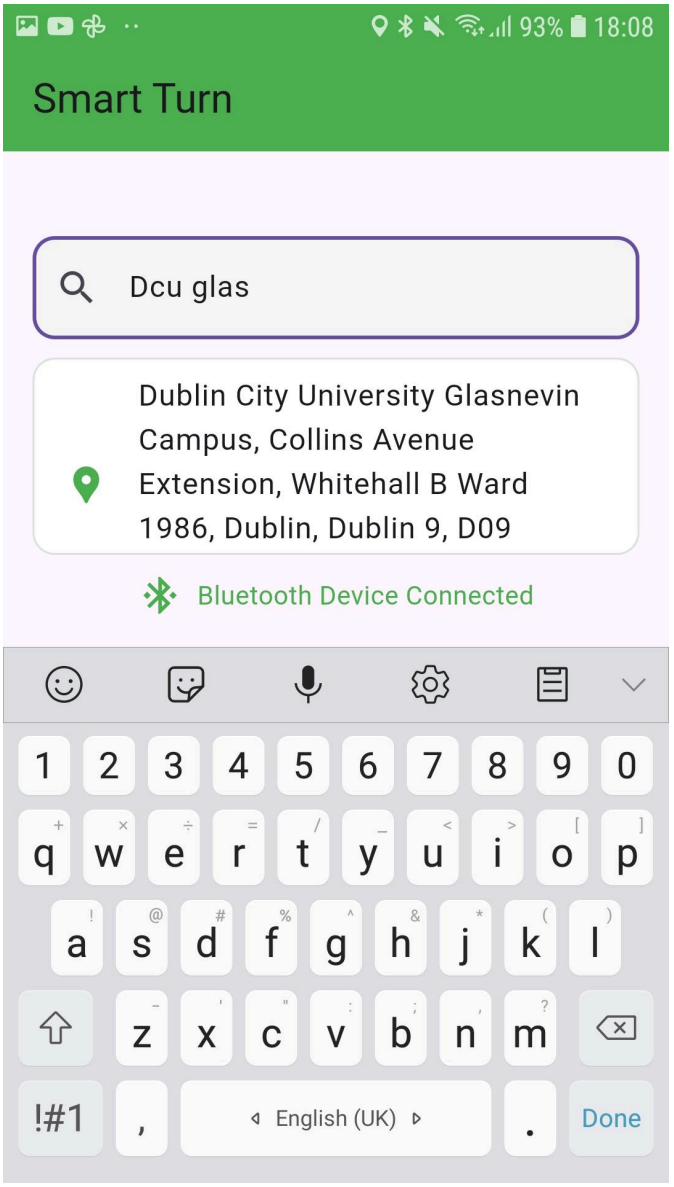


Fig5. View of suggested locations to choose from based on given Text

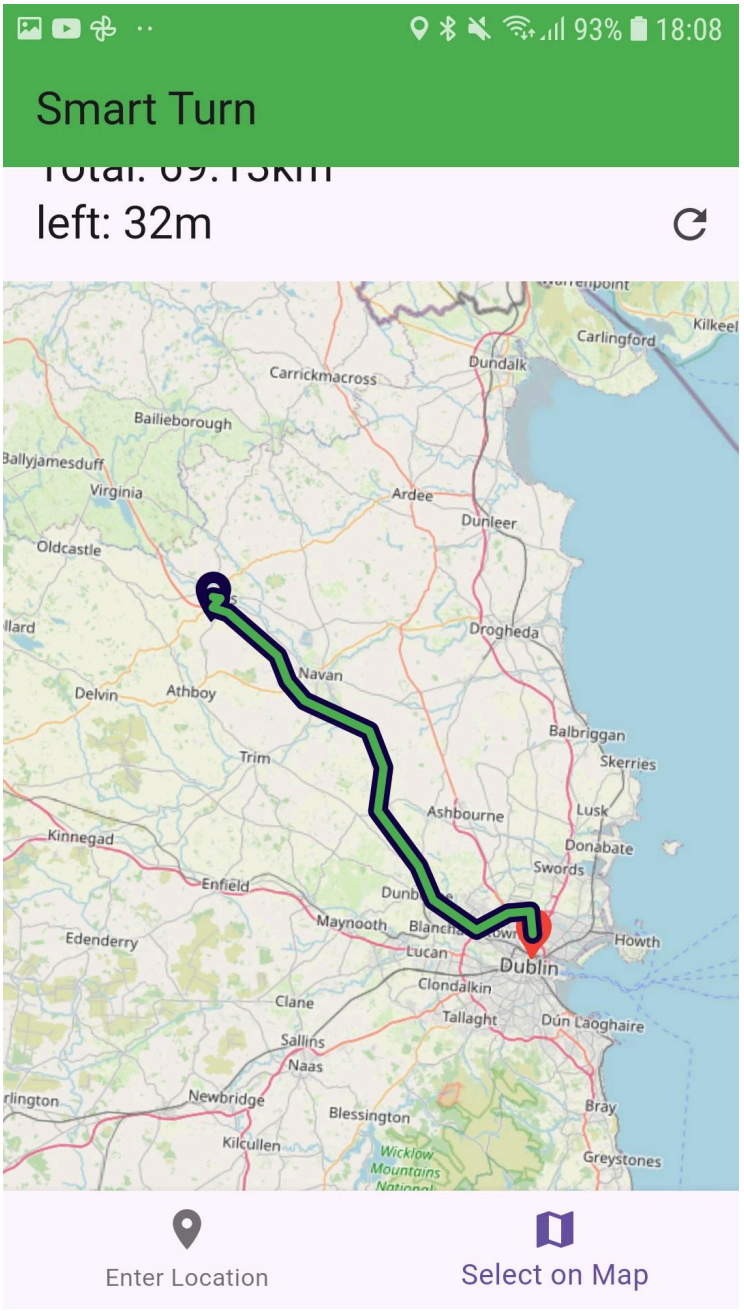


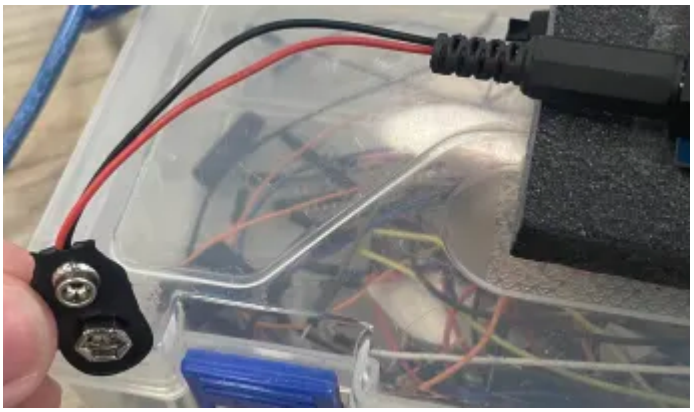
Fig6. Returned routed from selected textual input suggestions

Front Asembly

Includes Uno, MPR121 Touch Sensor, HC-05, Screen, 9V Battery.

Connecting Battery

Find this connector stemming out from the Uno



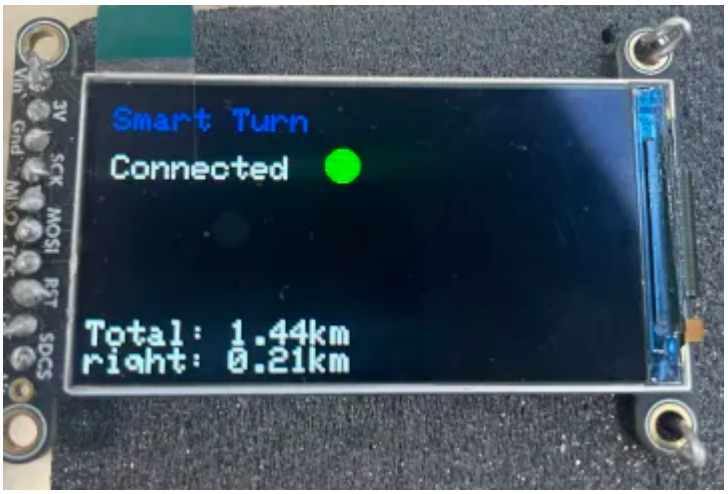
And connect the 9V battery so, the Uno will power on automatically. To power off simply disconnect the battery

Screen Information

This is how the screen will look like once the user launches the app and Bluetooth connects.

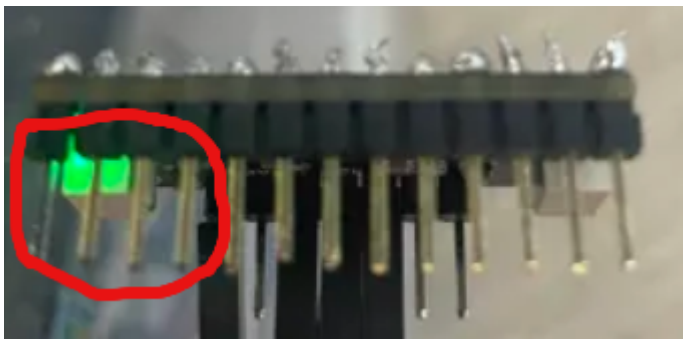
This is how the screen will look like once the user turns off the app and Bluetooth disconnects.

Once the user selects a destination and confirms it location updates will start to display in the bottom left corner of the screen.



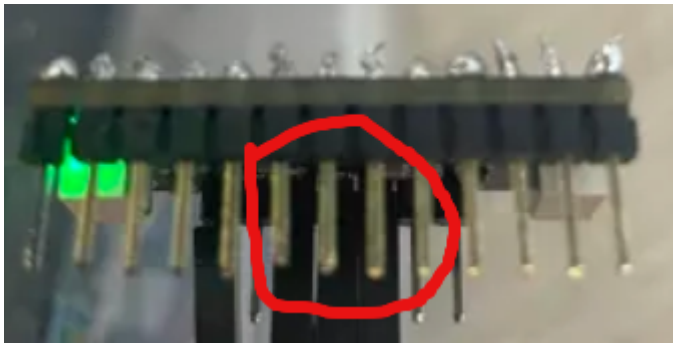
Touch Sensor Operation

To start the left turn signal tap on the touch sensor so, that if the right turn signal is on it will turn off.



The screen will display that the left turn signal is on.

To turn off any tursignal tap the middle of the touch sensor.



When no turn signal is on the screen looks like this.

To start the right turn signal tap on the touch sensor so, that if the left turn signal is on it will turn off.

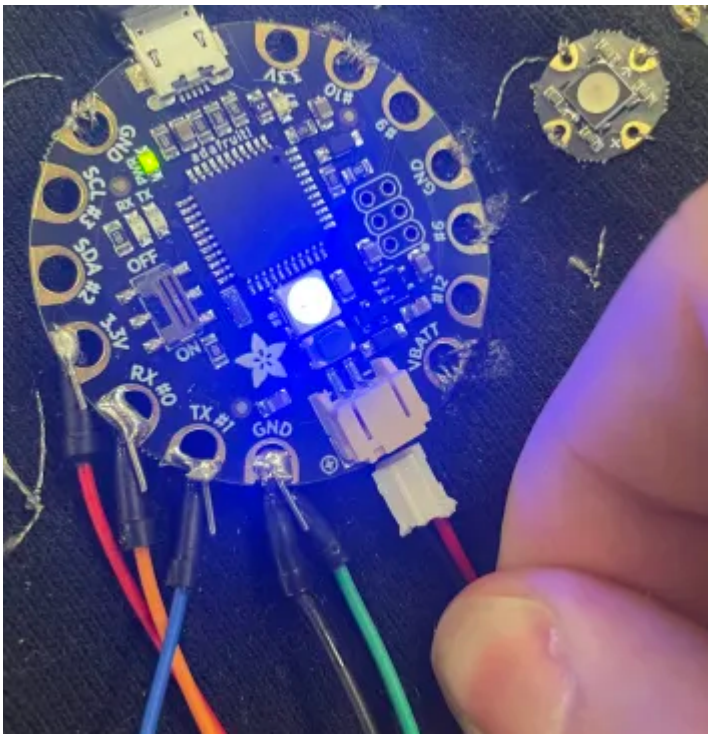
The screen will display that the right turn signal is on.

Rear Asembly

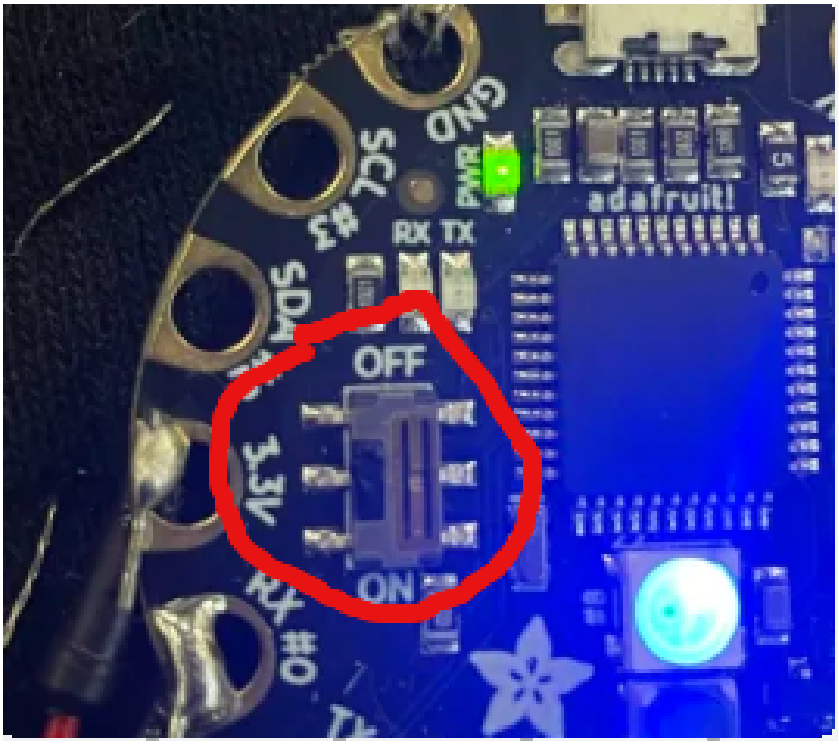
Includes Flora, Bluefruit BLE and LED Turn Signals, 3.7V Li-Po Battery

Powering On

First, connect the Li-Po battery to the Flora using this connector.

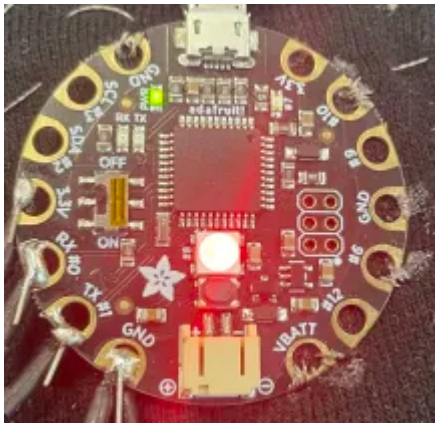


Then make sure you flick the following switch to **ON**.

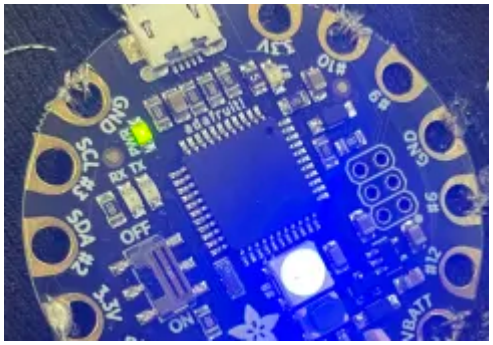


Bluetooth Connection Light

The Flora LED will be Red if it is not connected to Bluetooth.



Once a Bluetooth message has been passed to Flora the LED will turn Blue.



LED Turn Signals

Once the Flora is powered on and the user has launched the App the touch sensor can be used to Turn On and Off the Turn Signals
Here is what they look like once they are activated.