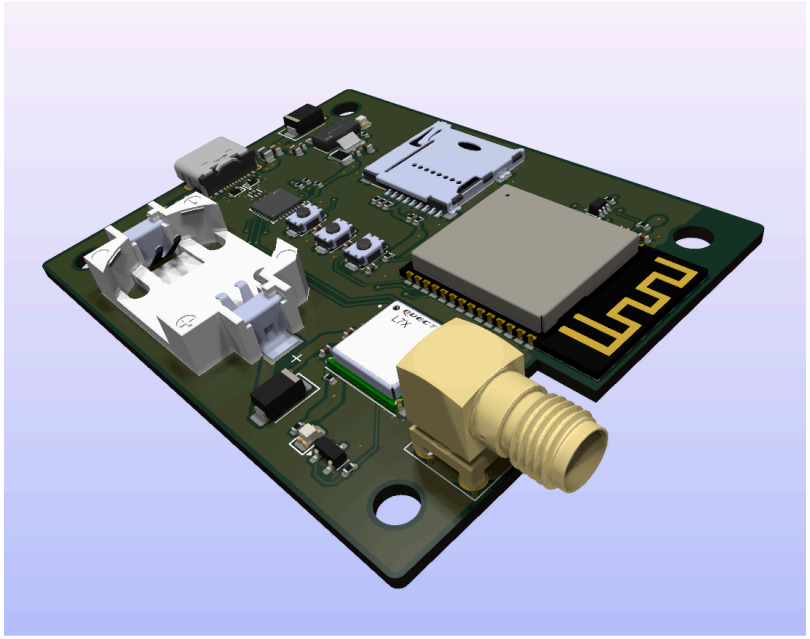
Jake Odgers

Mileage Logger Project



Scope

To log and display mileage for business purposes. With the ability for switching from personal journey to business journey.

Technical Design Skills

- RF waveguide design with a GCPW (Grounded Coplanar Waveguide)
- Differential pair routing for USB C datalines
- EMC and transient considerations
    - TVS (Transient Voltage Suppression)
    - Common mode chock
    - 4 layer board design with ground pours and power plane

Display

Option 1 - Display through a GUI on a computer made through Python Tkinter.

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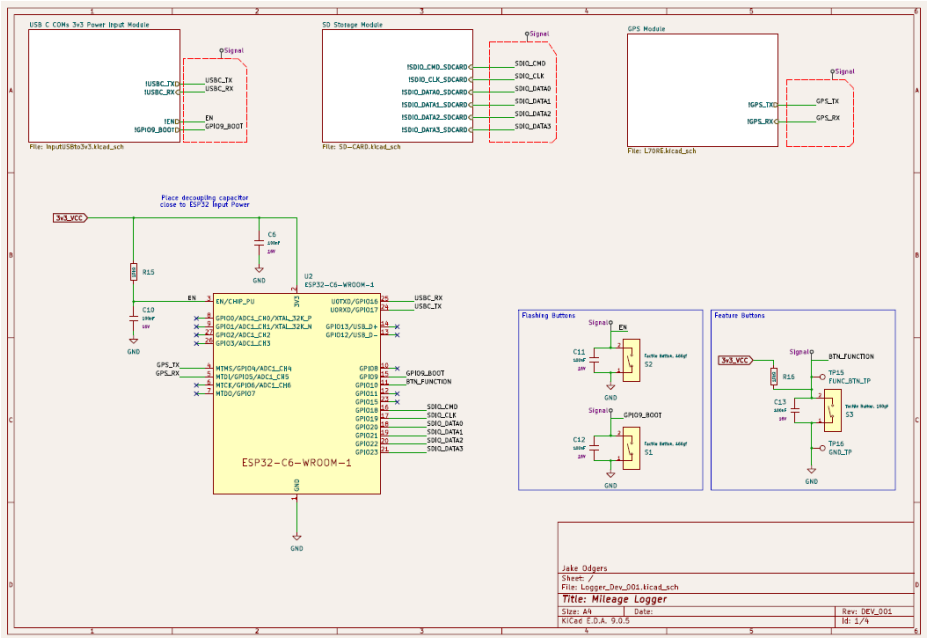
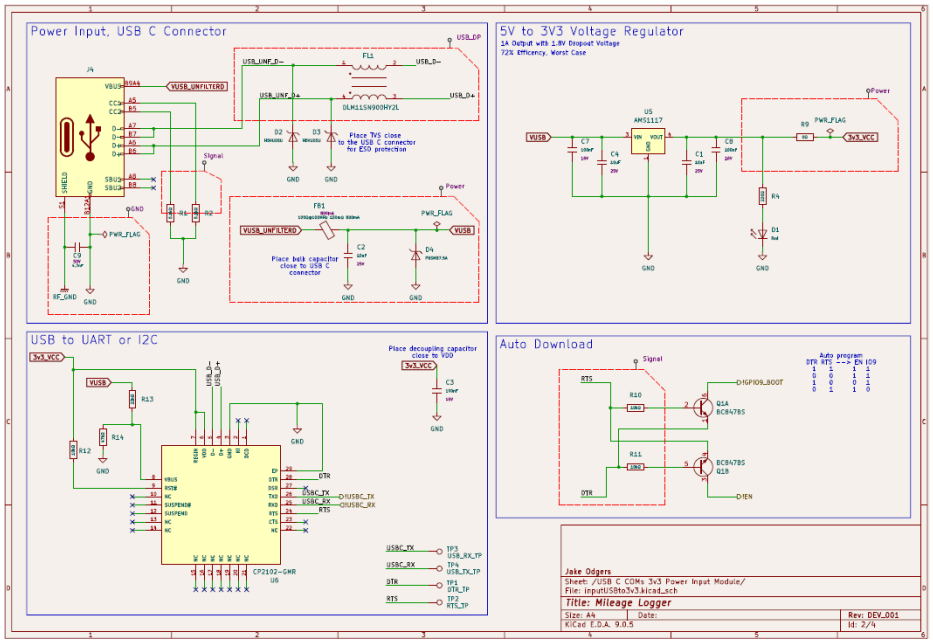
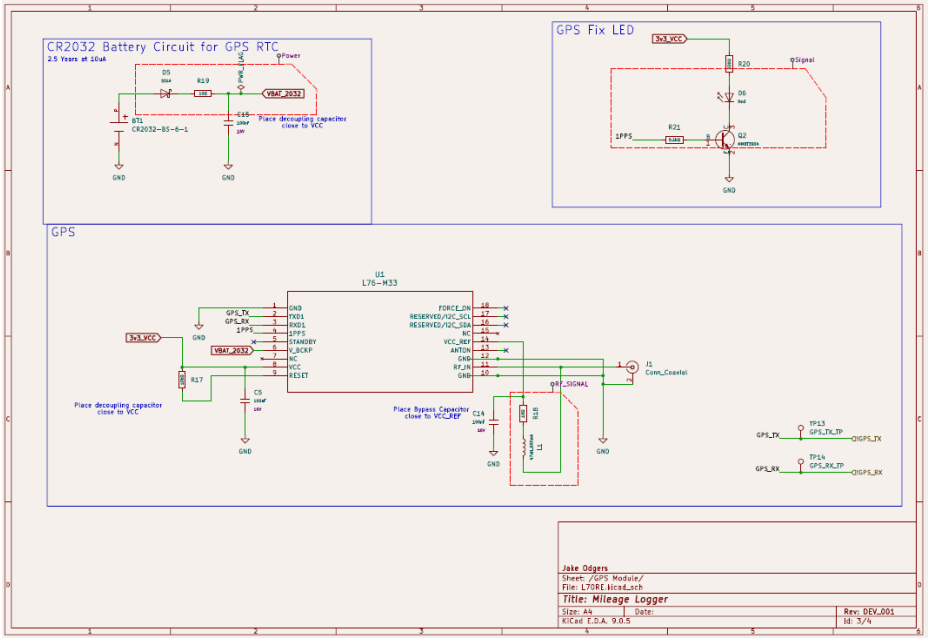
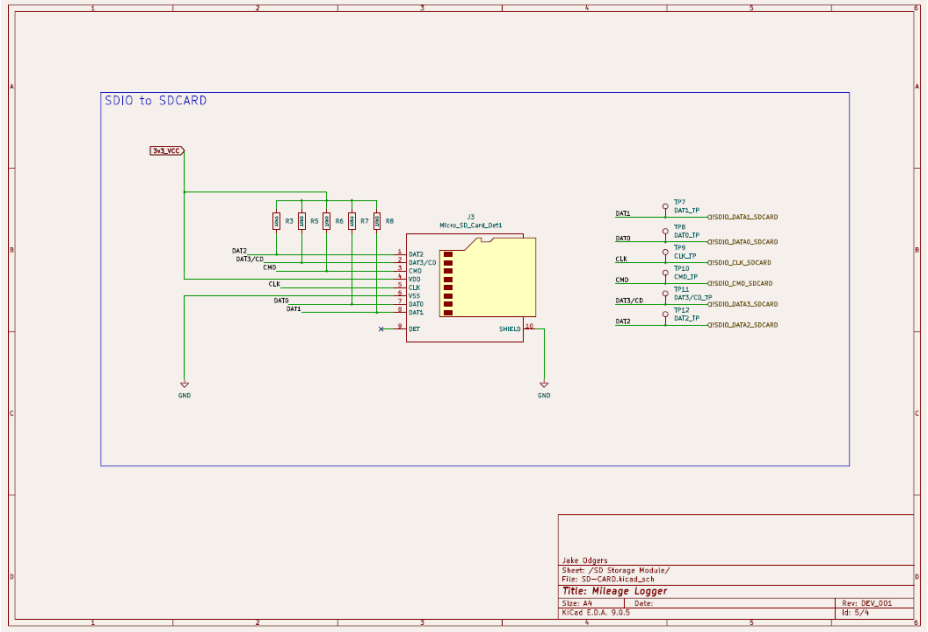
Schematic









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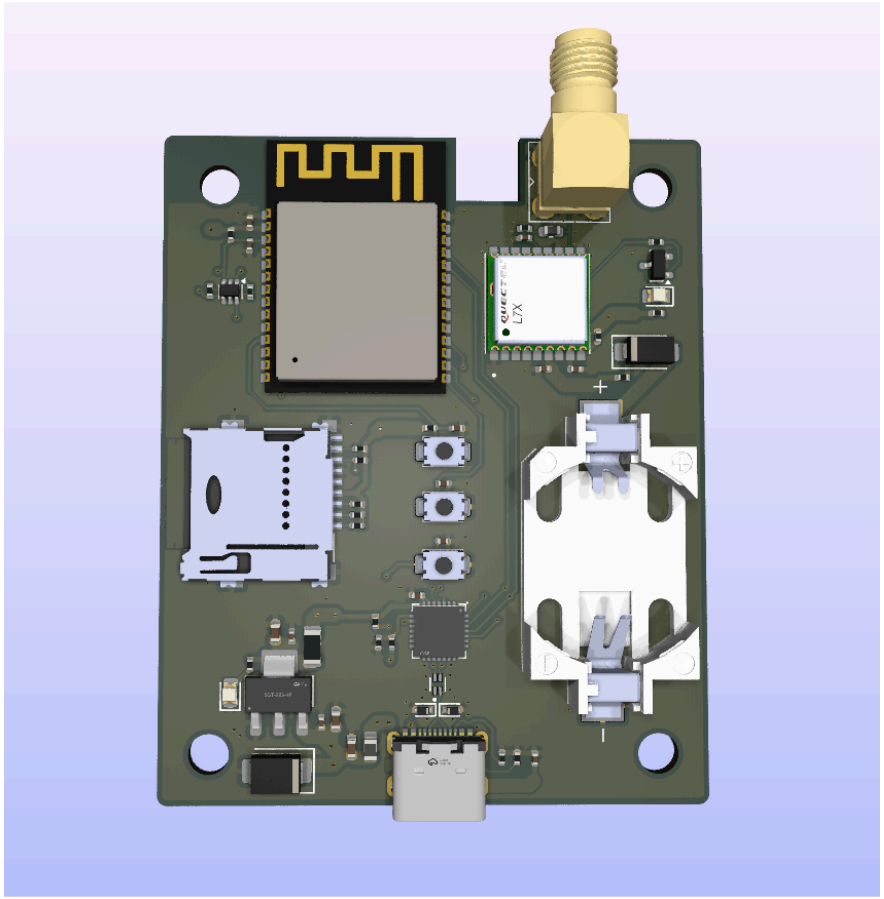
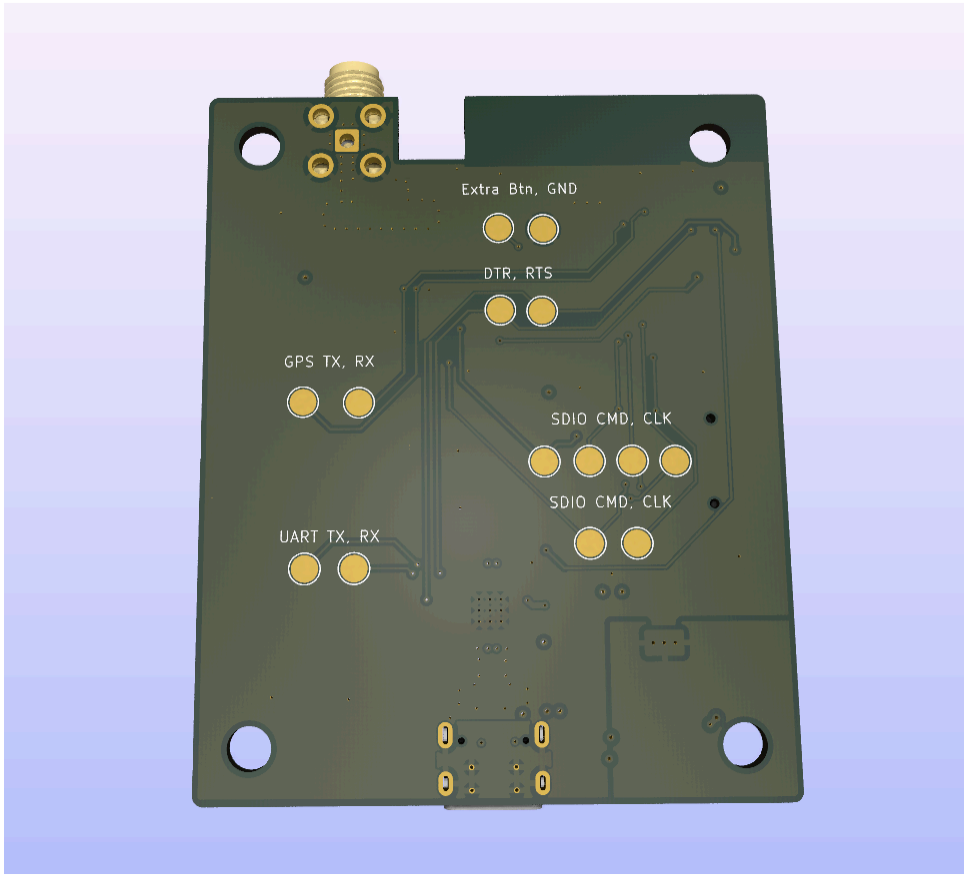
PCB Layout





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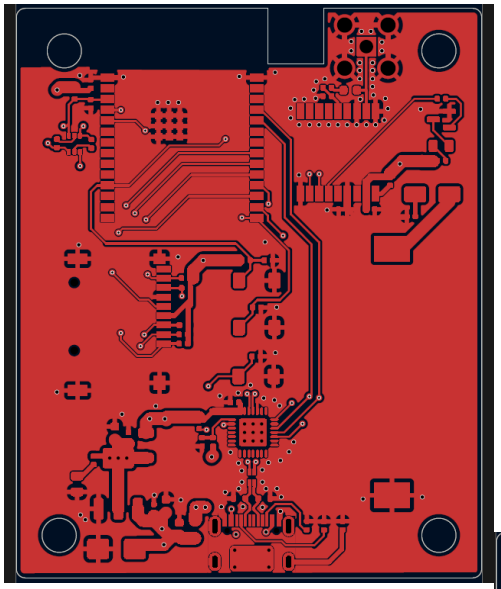
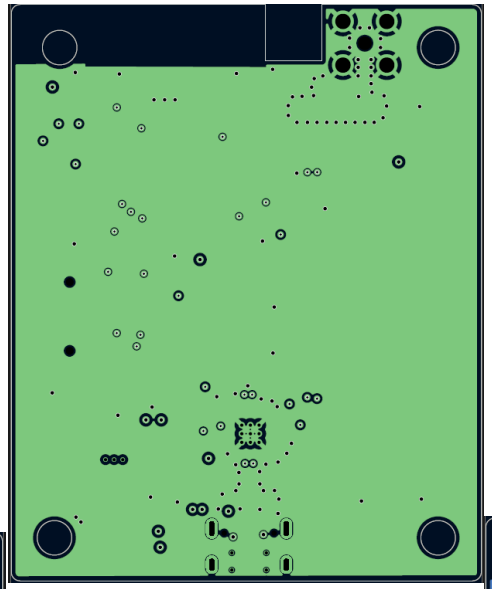
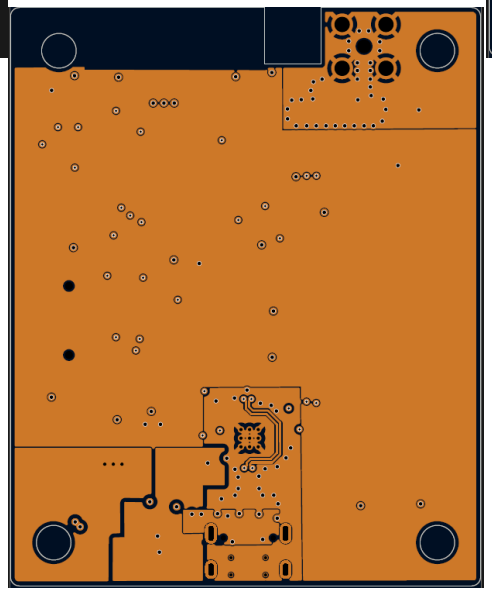
PCB Layer View



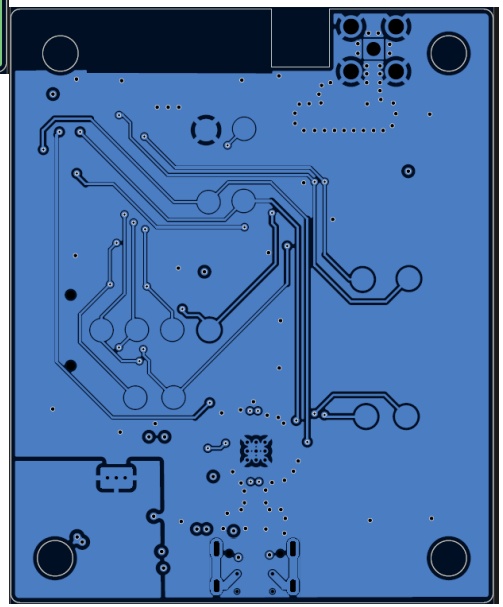
Layer 1 - Signal (with GND pour)



Layer 2 - GND



Layer 3 - Power (with GND pour around differential pair)



Layer 4 - Signal (with GND pour)

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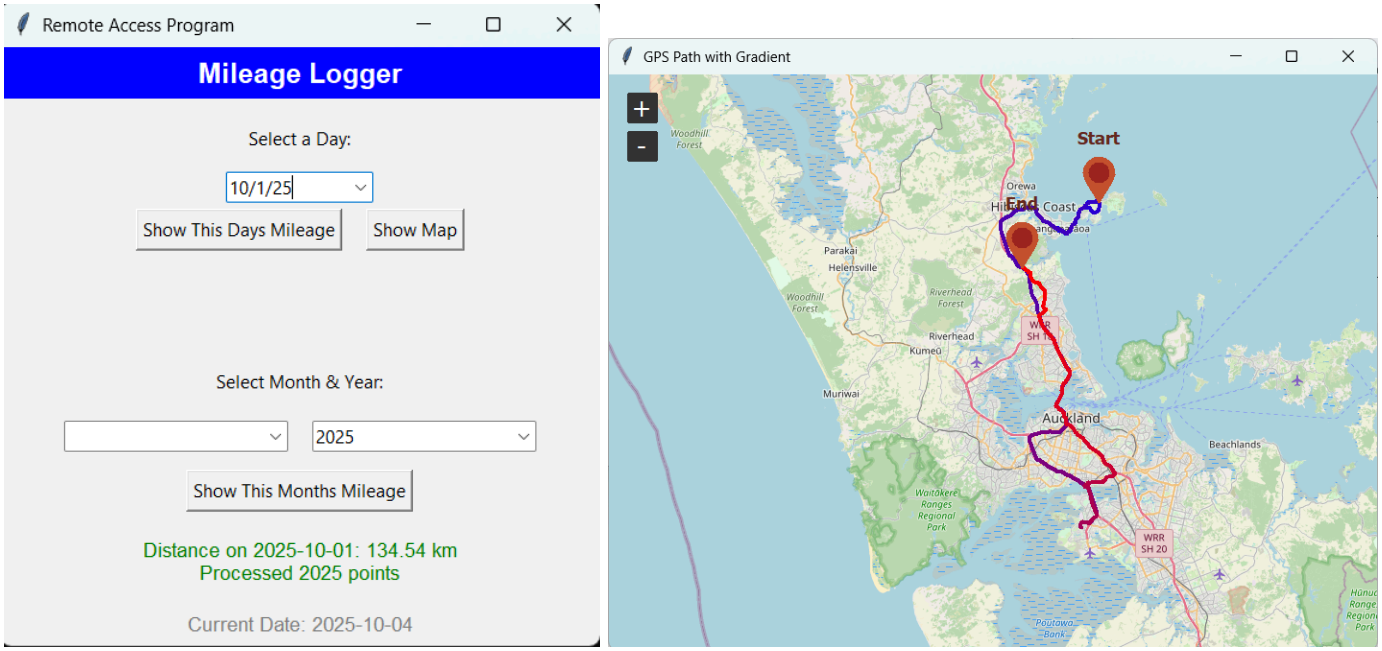
GUI

Option 1 - Computer Display


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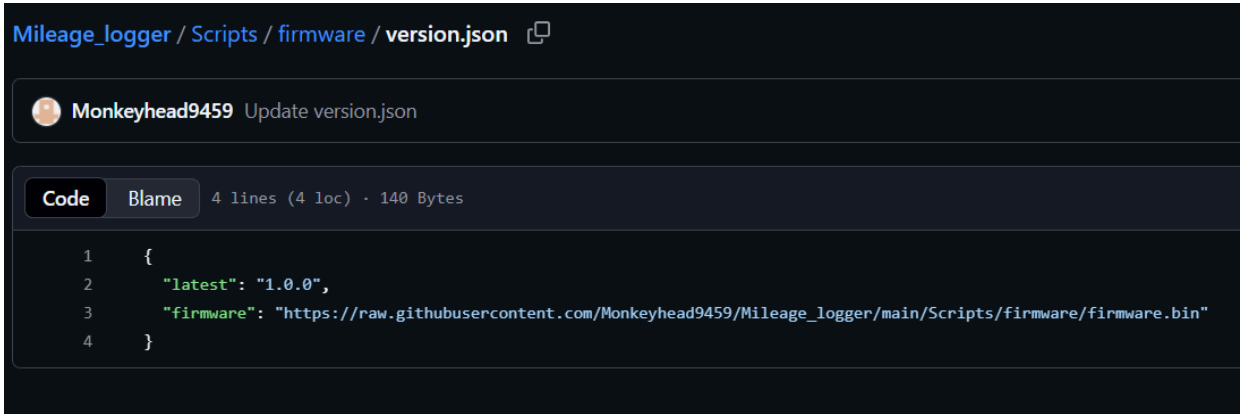
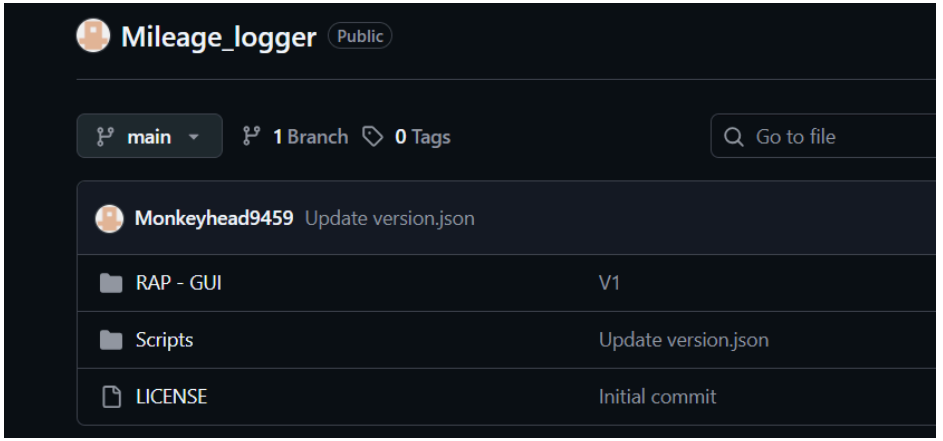
Back End

ESP32 REMOTE FIRMWARE UPGRADE THROUGH GITHUB

GITHUB VERSION CONTROL


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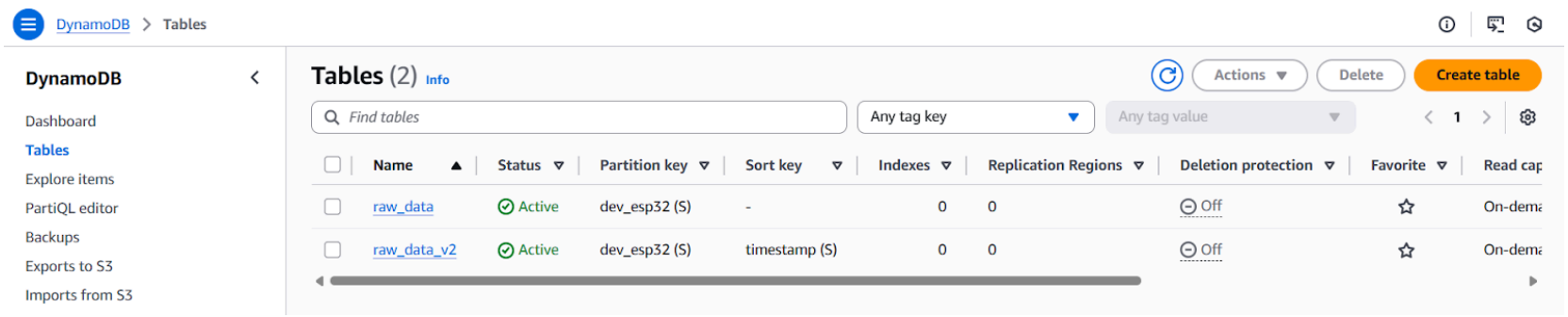
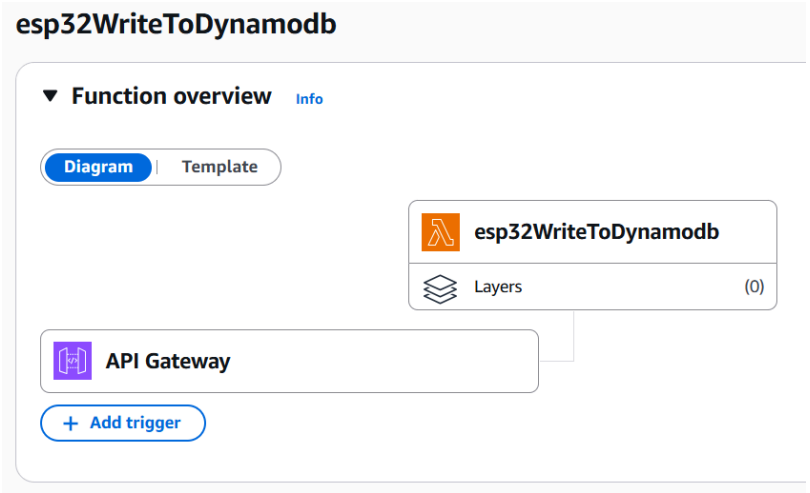
Back End

AWS DYNAMODB TABLE FOR CLOUD STORAGE



API GATEWAY TO LAMDA FUNCTION FOR ESP32 DATA STORAGE



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Improvements:

- Incorporate Google Roads API for more accurate mileage logging by snapping to roads
- Make a portable option for battery connection.
    - SMPS (Increase efficiency)
    - Smaller profile
        - ESP32-C3-MINI-1U
        - Offboard wifi and bluetooth antenna
        - Local/Smaller GPS antenna
- Option 2 for display is making an app through Flutter to connect to the ESP32 through bluetooth and store and display results as well as change journey status from business to personal.