Weekly Progress Report

Project Name: AWS PROJECT
Prepared By: Tobias Newman Muhanguzi
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1. Executive Summary

This week focused on significant hardware revisions for the Gateway and Power boards. Key efforts included upgrading the main processing unit, integrating active power monitoring, and enhancing connectivity standards. Prototyping components have been procured to validate these designs before final PCB fabrication.

2. Key Accomplishments

- **MCU Upgrade:** Replaced the main MCU with the **ESP-32-WROOM-32UE** to utilise an external antenna for improved range.

- **Power Board Logic:** Integrated an **STM32 MCU** onto the power board to enable real-time active power monitoring and adjustment.

- **Inter-board Communication:** Established **SPI and I2C** communication channels to facilitate data transfer between the Power and Gateway boards.

- **Connectivity & Power:**

    o Added an **FTDI interface** and **USB-C port** for programming and debugging.

    o Implemented basic power delivery via USB-C, including **reverse current protection** to prevent conflicts with external power sources.

    o Standardised connectors to the **XH-A_LF_SN series** for improved versatility and accessibility.

- **Procurement:** Purchased all necessary components to begin physical prototyping and design validation.

3. Pending Items & Design Considerations

- **UART Logic Circuit:** Design a logic circuit to switch the FTDI UART connection between the Main MCU, GSM, and LoRa modules, allowing all to be programmed via the single USB-C port.

- **Thermal Management:** Incorporate heat sink provisions in the next PCB iteration.

- **PCB Redesign:** Finalise the PCB layout only after the prototype circuits have been proven correct to minimise fabrication errors.

4. Plan for the Upcoming Week

- **Prototyping:** Assemble and test the revised circuits to confirm functionality.

- **Firmware Development:** Develop and test code/algorithms for the new hardware configuration.

- **Design Refinement:** Make necessary adjustments to the PCB design based on prototyping results.