# Custom PCB Specification Document

## 1. Overview

**Purpose**

* Design and develop a custom PCB for remote sensing and communication.

**Size Constraints**

* Maximum dimensions of 14x14 cm, ideally within 12x12 cm.

## 2. Functional Requirements

**3-Pin Jumper Wires for DHT22/DHT11**

* Accommodate sensors for temperature and humidity.

**Central Camera**

* Integrate a camera at the center of the board.

**Battery Connectivity**

* JST connector for a 3.7V LiPo battery.
* Feature for measuring battery level.

**Solar Panel Connectivity**

* JST connector for solar panel input.
* Solar charging functionality for the battery.

**Power Button**

* Ability to connect with momentary button with or without LED (see link) to restart the device or power it off (push for long)
* <https://www.aliexpress.us/item/1005003623296396.html?src=google&aff_fcid=c7cbc1303c24483da3d557252250ede5-1703313107851-06657-UneMJZVf&aff_fsk=UneMJZVf&aff_platform=aaf&sk=UneMJZVf&aff_trace_key=c7cbc1303c24483da3d557252250ede5-1703313107851-06657-UneMJZVf&terminal_id=609ddbcf5b41451594b9b952017d28ec&afSmartRedirect=y&gatewayAdapt=glo2usa>

**GPS Receiver**

* Inbuilt GPS module or provision for an external GPS antenna via a coaxial outlet.

**4G Communication**

* 4G module integration.
* SIM card slot.
* Provision for an external antenna if required.

**Embedded Software**

* Telemetry and image data transmission to AWS.
* Ability to perform the aforementioned power functions.
* Image storage on AWS S3.
* Configurable intervals for telemetry and image transmission, with local storage in case of connectivity issues.

## 3. Design and Development Phases

**Feedback #1 (Initial Design Review)**

* Basic geometry and Bill of Materials (BOM).
* Feedback on location of basic components to align with the product assembly
* Battery capacity and solar panel power estimates.
* Review of preliminary PCB schematic.

**Feedback #2 (PCB Layout Review)**

* Review of the PCB layout after achieving the first milestone.

**Feedback #3 (System Testing)**

* Testing on the Client's AWS system.
* Final approval after successful testing.

## 4. Power Management

* Analysis of power requirements for telemetry (every 30 minutes) and daily photo capture.
* Power budgeting and efficiency considerations.

## 5. Mechanical Design

* Board layout considering component placement and thermal management.
* Mechanical robustness for field deployment.

## 6. Compliance and Standards

* Adherence to relevant electronic and communication standards.

## 7. Quality Assurance

* Testing protocols for board functionality and reliability.

## 8. Documentation

* Detailed design documents, including schematics and layout files.
* Software documentation for AWS integration and local data handling.

## Appendices

* Preliminary BOM.
* Power consumption and efficiency calculations.
* Compliance certificates and testing reports (as applicable).