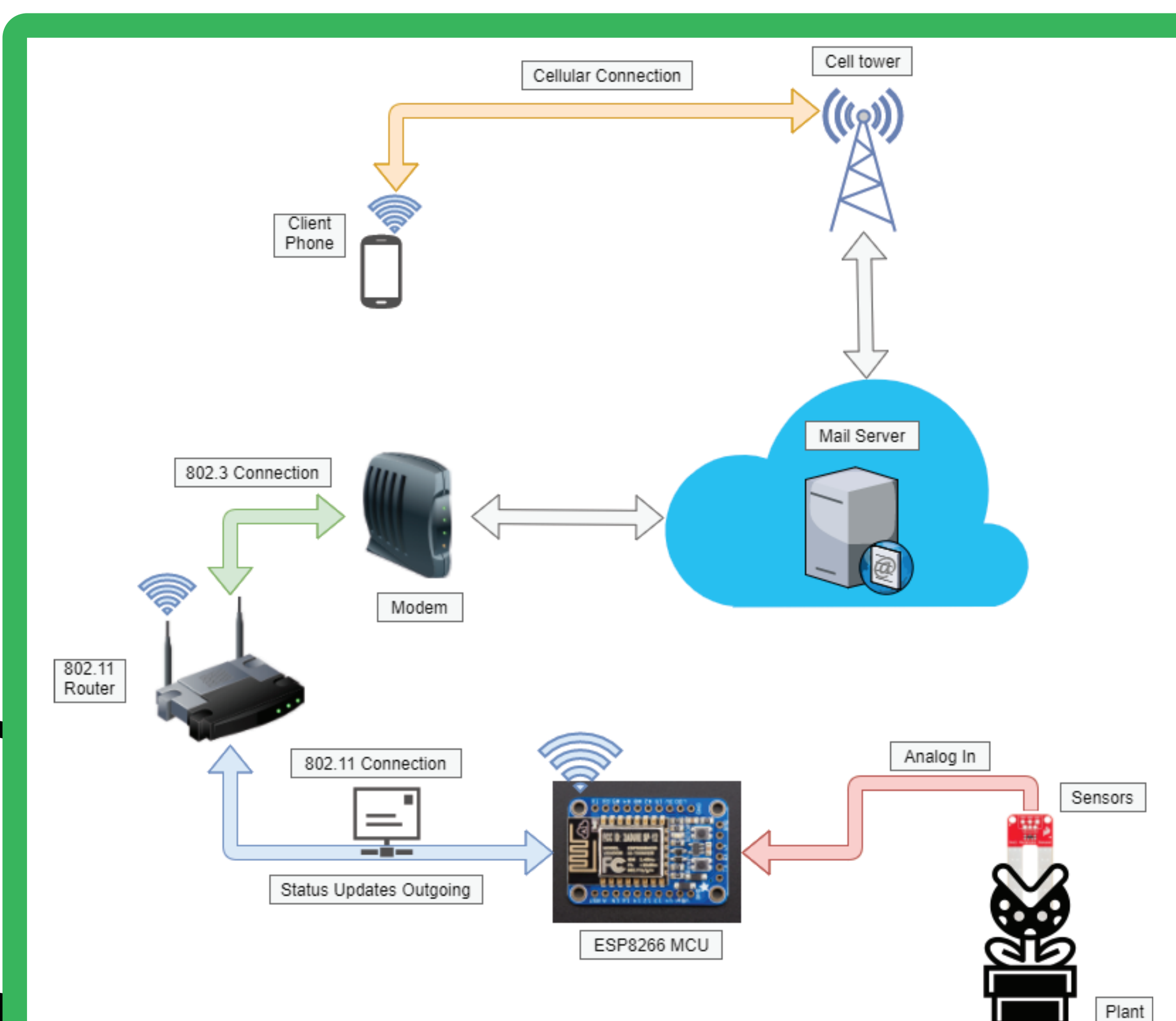


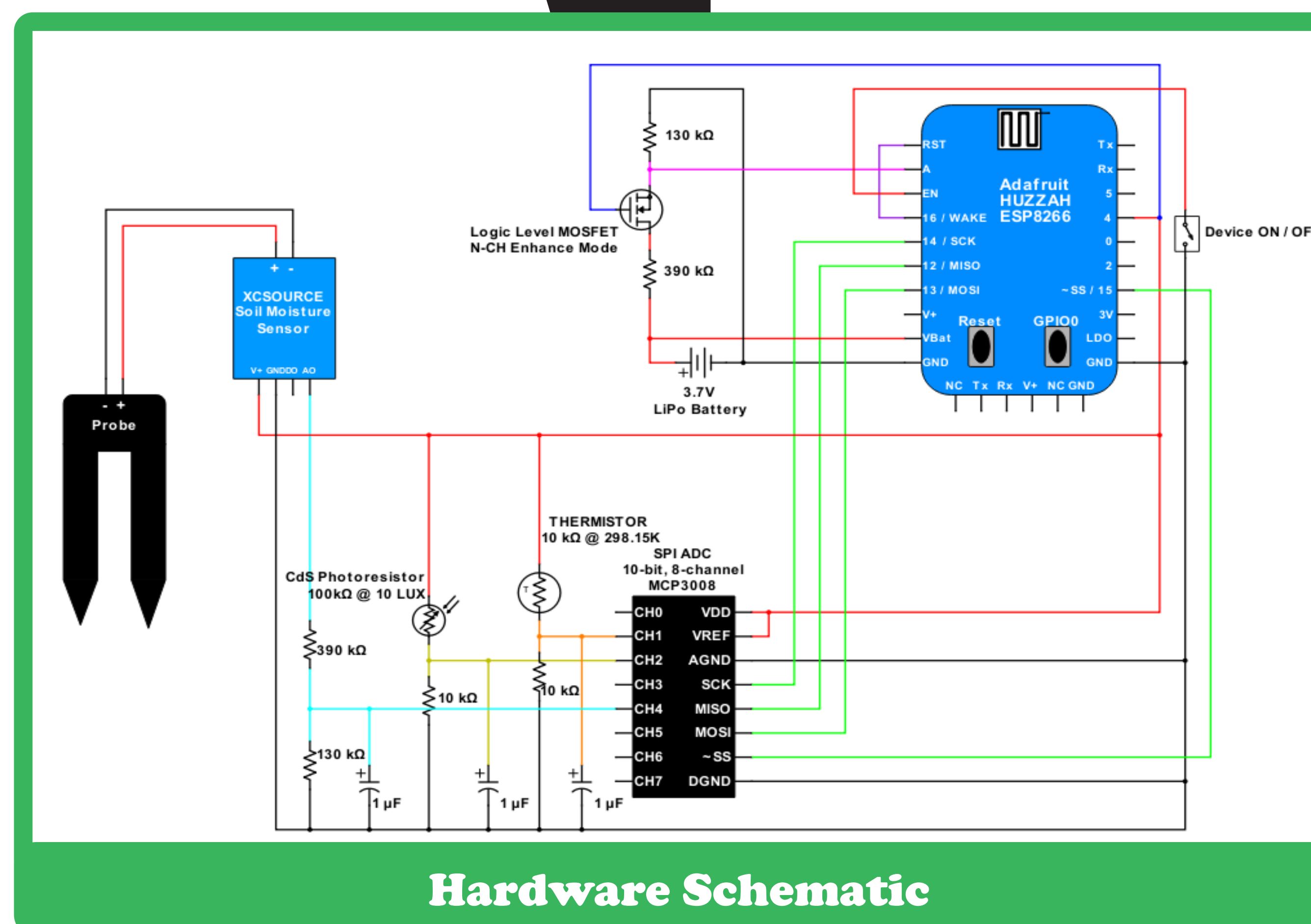


## Project Goal

Design and implement a low-cost, low-power, wireless sensor package that is capable of monitoring various metrics of indoor plants.



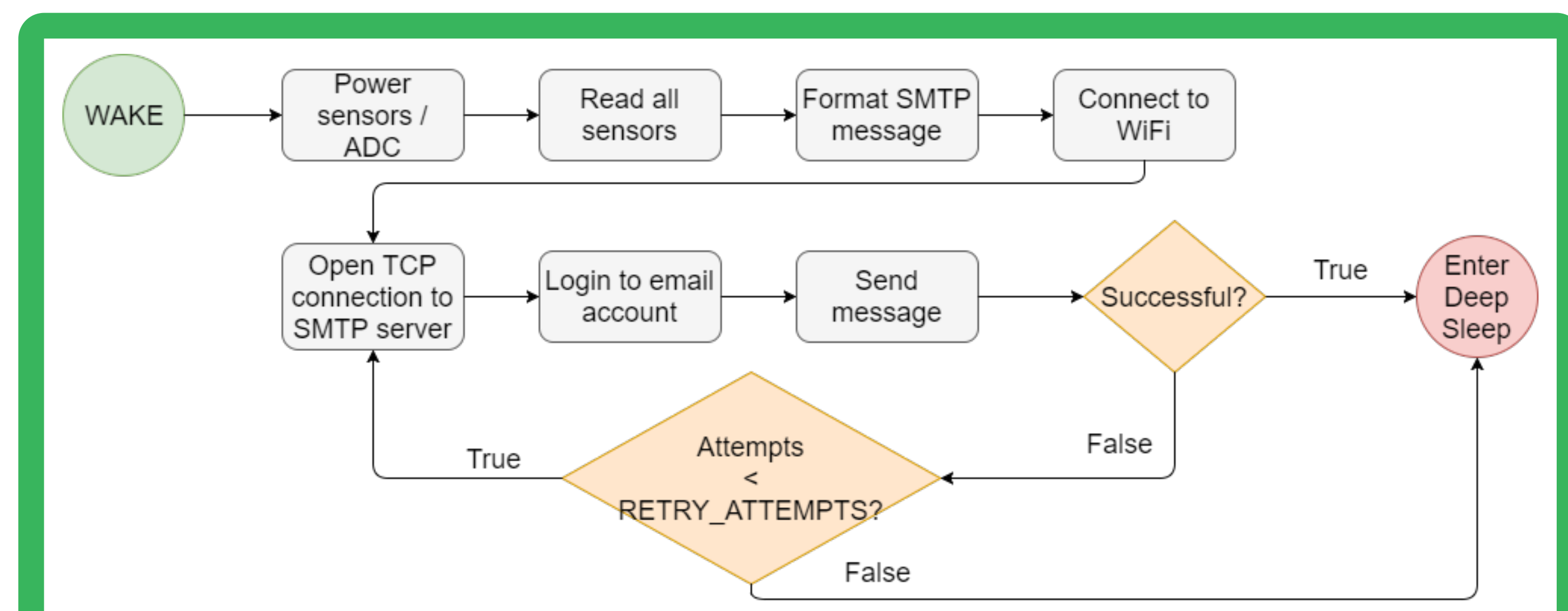
System Overview



Hardware Schematic

## Core Features

- Low-power 32-bit MCU w/ full WiFi front-end easily connects to any wireless network
- Low-cost: Each node under \$20 in materials
- Calibrated photoresistor to measure light intensity
- Thermistor allows for temperature monitoring
- Soil moisture sensor measures resistivity of soil to estimate moisture content
- Battery life monitoring built-in
- SMTP-based plant updates with user-configurable update interval

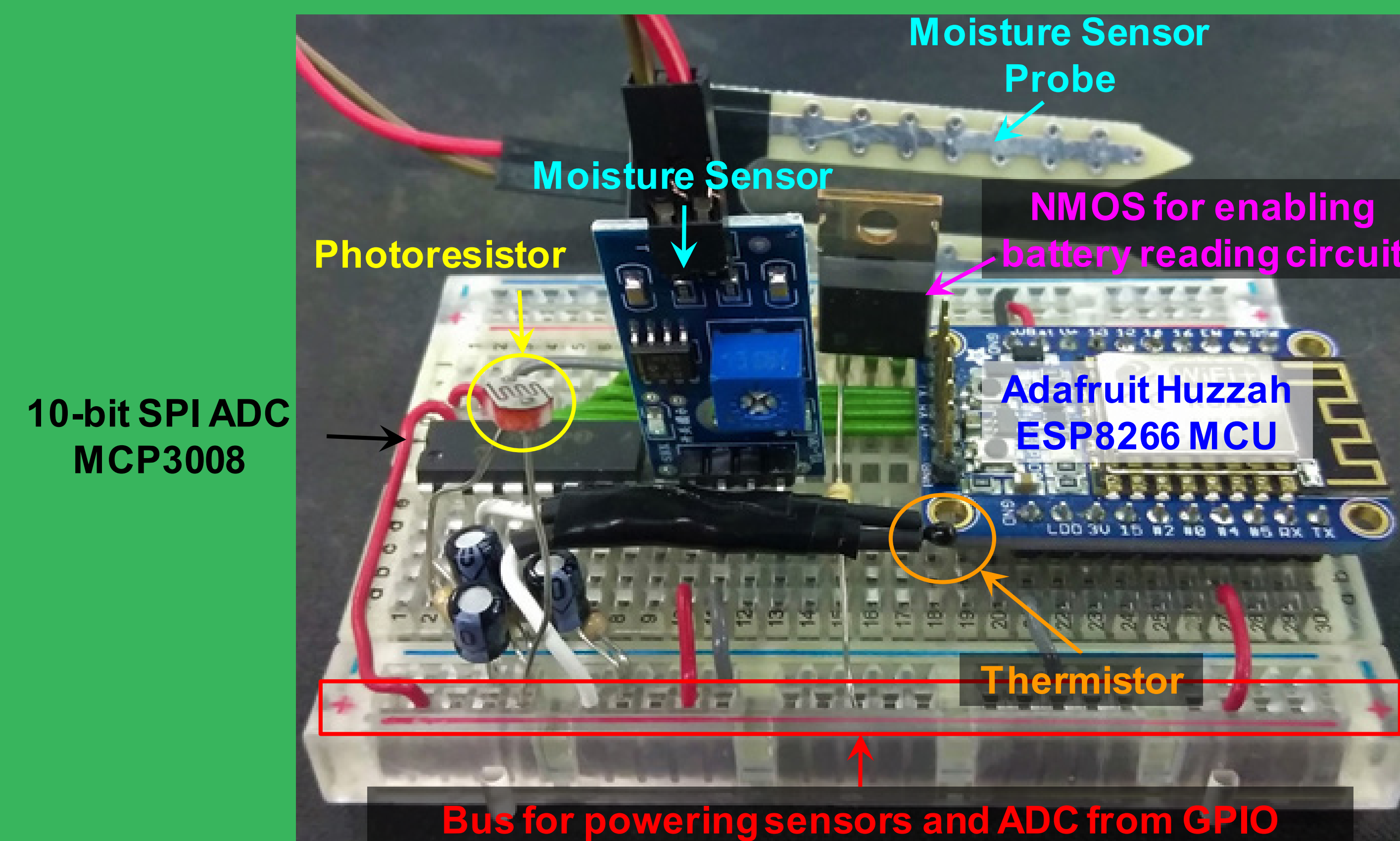


Software Flowchart

## Ultra-Low Power

- Sensor Read Mode: 1.172mA (~1 second to read all sensors)
- Transmit Mode: 120mA (~1 minute to Tx)
- Deep Sleep Mode: 20μA
- Average consumption: ~2mA with hourly updates
- 2200mAh battery gives ~45 day lifespan with hourly updates

## Breadboard Implementation



## Future Additions

- Integrate auto-watering capabilities
- Create waterproof enclosure for outdoor usage
- Implement mesh network of sensor nodes to extend connection range capabilities
- Develop fully-featured mobile app to wrap SMTP update messages for clean display of metrics and allow individual node configuration
- Add solar panel to further extend battery life