# Background

# Aim

* See if enclosure can be shrunk
* See if it works in the new configuration

# Method

## Hardware Overview

|  |  |
| --- | --- |
| Microcontroller | Seeeduino Stalker v2.3 |
|  |  |
| Battery | 980 mAh Lithium Polymer |
|  |  |
| Solar Panel | 0.5W Mono-crystalline |
|  |  |
| Air Temperature | DS18B20 |
|  |  |
| Case Temperature | DS3231 (Dallas Semiconductor) |
|  |  |
| Wall temperature | DS18B20 |
|  | TMP006 |
|  |  |
| Relative Humidity | RHT03 |
|  |  |
| Luminosity | TSL2561 |
|  |  |
| Sound Level | Freetronics Mic[[1]](#footnote-1) |

* Sensors have been removed from the last prototype to remove redundant sensors and code

## Code/Operation

* The sensor module wakes every 5 minutes to take a sample and transmit the data
* XBee is running in API mode
* All data is transmitted and recorded in its raw form (bytes)
* Current consumption is being recorded, but without the actual sensor
  + The recorded data should thus report a current of 0

## Enclosure

* Case modification (compared to last prototype)
  + Enclosure is much smaller than the last prototype
  + The outside of the enclosure has been painted white
    - Some parts have been left uncovered to see some internal indicator lights
  + The enclosure will be mounted on the wall with its window facing out horizontally
  + All holes and external electrical connections have been sealed with epoxy
  + A plastic skirting has been attached to the sides of the enclosure, extending past the bottom face to protect the sensors mounted on the underside of the enclosure
* Solar
  + The panel has been mounted on top of the case at a slight angle
* Temperature
  + The RTC has an internal temperature sensor to measure the case temperature
  + TMP006 is mounted on the underside of the enclosure
    - The sensor is pointed at the wall that the sensor module is mounted on
  + DS18B20 (air) is located on the bottom of the enclosure
    - The sensor has been encased in epoxy
    - The sensor does not extend past the protective skirting to keep it dry and in the shade
  + DS18B20 (wall) is located on the bottom of the enclosure
    - The sensor has been encased in epoxy
    - This sensor has a long lead that extends below the enclosure skirting so the sensor can be attached directly to the wall
* Humidity
  + The RHT03 sensor is fixed to the underside of the enclosure, inside the protective skirting
  + Originally, the HTU21D sensor was selected as the humidity sensor
    - Sensor operation was extremely temperamental and did not function at for the majority of the time
    - Several steps were taken in an attempt to improve the sensor reliability
      * Sensor header was relocated closer to the microcontroller pins
      * Wiring was shortened between sensor and board
      * Clock and signal wires were physically separated
    - The sensor would sometimes respond, but is usually not found
* Light
  + TSL2561 is inside the enclosure, facing directly outwards of the acrylic front face
    - The sensor area was not painted to allow internal mounting of the sensor
* Sound
  + The microphone is fixed on the inside of the enclosure, on the acrylic front face
    - A hole has been drilled in the window to push the microphone through to the outside, then sealed with epoxy
    - The remaining circuitry is still inside the enclosure
* Current
  + The current sensor has not been attached to this prototype
  + However, use of the current sensor requires a hole to be drilled in the side of the enclosure to allow for cable entry

## Test Conditions/Location

# Results

# Discussion

# Conclusion

1. Microphone was connected to the controller, but not sampled due to program space limitations [↑](#footnote-ref-1)