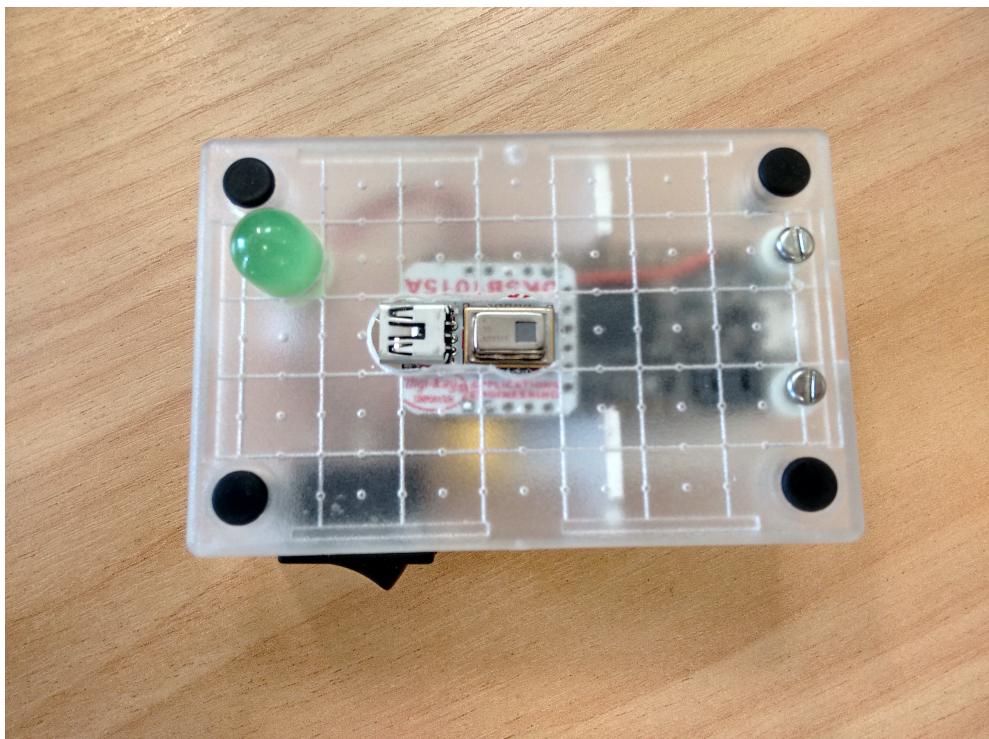


BRANZ Occupancy Sensor System
B.O.S.S.
Technical Guide
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February 2, 2017



1 Introduction

This document is meant to help and introduce you to the BRANZ Occupancy Sensor developed as part of a summer scholarship in the summer of 2016/17. In this guide you'll find how to build a unit yourself, how to use the provided GUI and the expected performance of this device.

2 Build a Unit

The non-generic parts you'll need are a Panasonic Grid-Eye, I used an AMG8831 though I believe it should work with other models. To save time I brought a breakout board from Digi-Key.

<http://www.digikey.com/product-detail/en/digi-key-evaluation-boards/DKSB1015A/906-1002-ND/4360804>

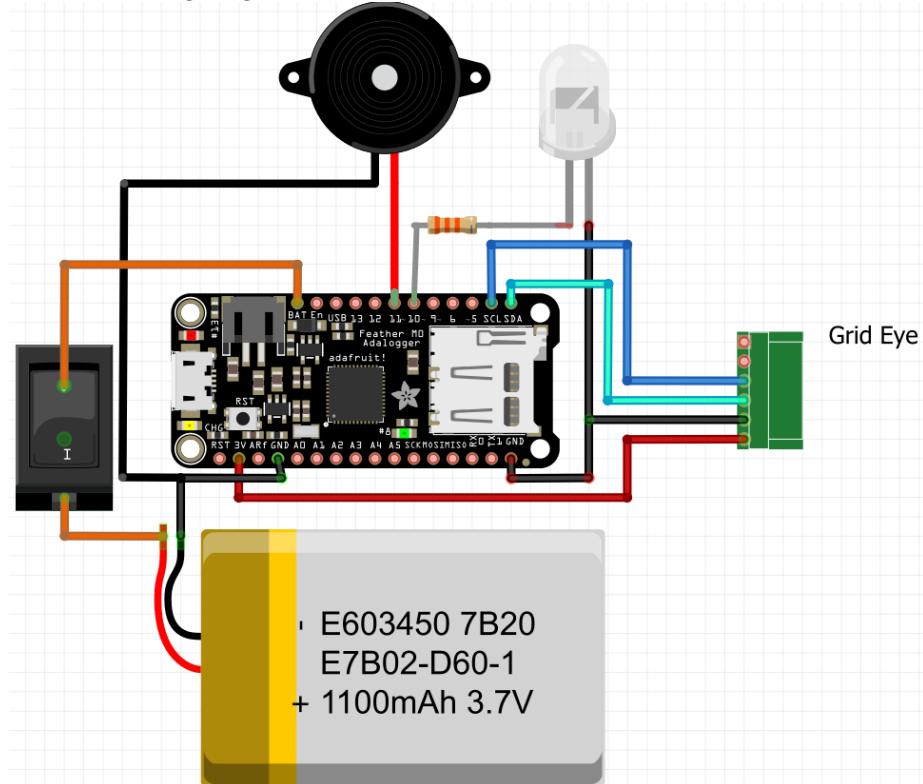
Feel free to make your own PCB, all you need is access to the I2C pins (Pins 2 and 3 on the Grid Eye).

A Feather M0 Adatalogger
<https://www.adafruit.com/product/2796>

The Adatalogger is used due to its built in SD card reader.

Other than that you'll need a Lithium-Polymer battery, a switch and a piezo buzzer. I also included an extra LED (with $33\text{k}\Omega$ resistor) in mine but that was mostly for debugging.

Below is a wiring diagram of the device



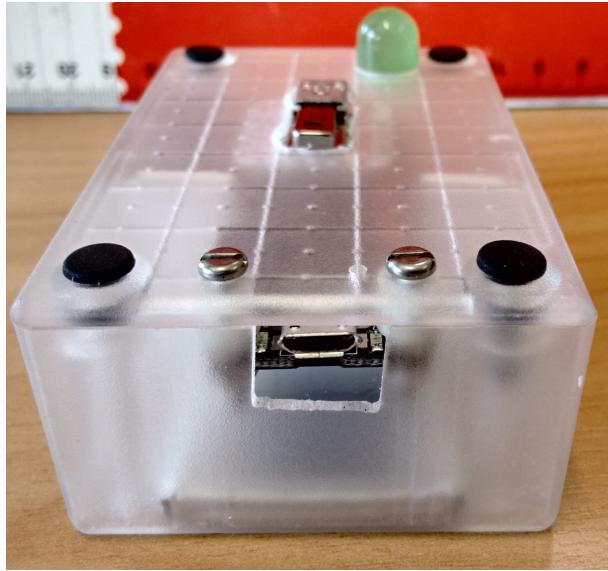
3 Using the Device

Positioning Mount the device to the roof above the area you want to monitor. I find it easiest to use Blu-Tack. Best results are obtained when the sensor is within about 2m of the occupant, of course closer is better.

Turning it on Each time the device is turned on it will create a new file on the SD card. It also starts by collecting a thermal background so the sensing area should be empty between turning it on and the device finishing beeping. It will beep 10 times followed by a happy tone on start up. It is often useful to note down the time you turned the device on so that the clock values can be adjusted later from the accompanying software.

The Green Feedback LED The large green LED on the front tells you when the space is occupied or not and is helpful to tell if the device is measuring correctly or not.

Charging To charge the device plug it into a computer using the micro USB port on the feather (broken out on the original device)



4 Windows Computer Software

When the device is connected to the computer, not only does it charge the battery (you will need to have the on/off switch on for the battery to charge) but you can save and delete files from the SD card.

Find COM The first thing to do is to find your device, click find COM. If there is only one COM port available the program will automatically choose that port (notified through the status bar). Otherwise click on the COM port your device is on. If you're not sure which one is your device, open the device manager (this can be done by right clicking on the windows button at the bottom left of your screen) and under "Ports (COM and LPT)" look for the Adafruit Feather M0. Then select this COM port back in the BRANZ Occupancy Sensor software.

Load The load button allows you to load in an occupancy log from the SD card. The status field shows progress and the green feedback LED blinks as it sends.

Once the file is loaded it can be read in the text pane and a graph is displayed.

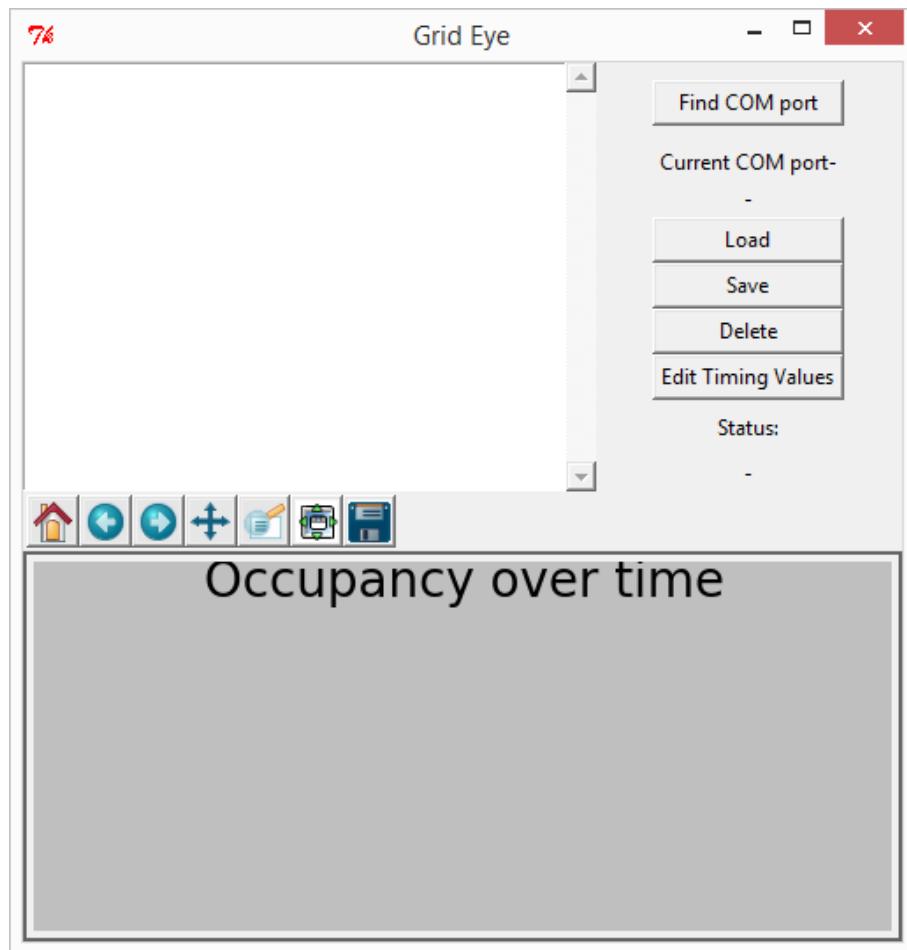


Figure 1: The software on startup

Save A loaded file can be saved by choosing the save option. Otherwise the file can be found in the folder where the software was launched from. When saving it will take a bit longer than usual.

Edit Timing Values This allows you to change the Real Time Clock values in the data. Normally you would note the date and time that you started the device and then you can just write that into the pop up field (in the correct format). All times will be updated as if they started from that time.

Delete Use this option to delete a file from the SD card, it also has a 'Delete All' button in the pop up window. Deleting takes a bit of time and the only feedback is in the status window so be patient with it.

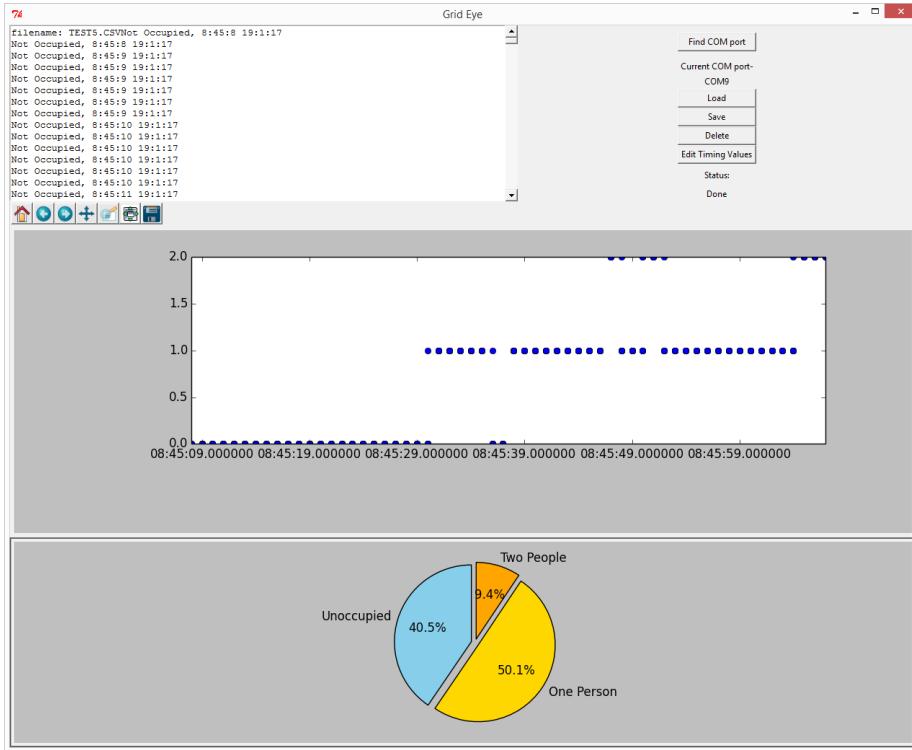


Figure 2: The software after loading

4.1 Problems

Almost all problems can be solved by unplugging the device and closing the software, then trying again. This software is designed to be helpful but is by no means a finished product so there are bugs.