

# Fabrication Instructions for the Mobile Sensor Platform

## Materials required:

- Arduino Uno R3
- Adafruit Ultimate GPS Logger Shield
- DHT 22 temperature and humidity sensor
- 1k Ohms Resistor (x1)
- Lithium Ion 3.7V 1200mAh Battery
- Adafruit PowerBoost 500 Charger
- 2.1mm Male DC barrel connector
- On-Off toggle switch
- Red, Yellow, and Black wire
- Soldering iron
- Solder

## Attach thermometer to GPS logger shield

Figure 1:  
Thermometer  
unit with wires  
soldered onto  
leads.



Begin by soldering a section of red wire to the 1<sup>st</sup> pin of the thermometer, yellow wire to the 2<sup>nd</sup> pin, and black wire to the 4<sup>th</sup> pin. The 3<sup>rd</sup> pin of the device should be left unused (Figure 1, to left). The red wire will be the voltage input for the thermometer, so solder the red wire to the 5V pin on the GPS logger shield. The yellow wire delivers the digital signal from the sensor to the logger shield, so solder it to pin 9 of the shield. Finally, the black wire will be the ground for the sensor, so solder it to any of the ground pins – marked with Gnd-on the shield (figure 2, next page).

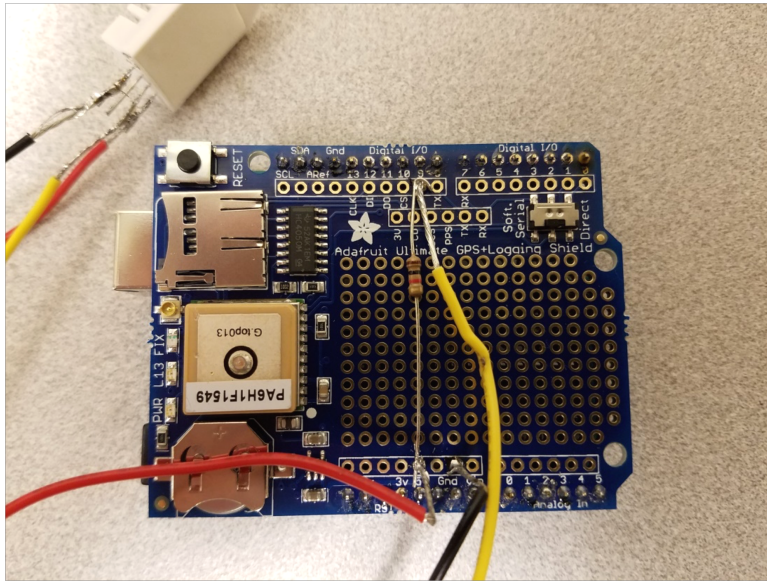


Figure 2: The yellow wire connects to pin 9, the red wire connects to +5v, and the black connects to Gnd. Solder the resistor between +5v and pin 9.

The last step is to connect the yellow and red wires with the 1k Ohms resistor. The easiest way to do this is to solder one end of the resistor to pin 9, where the yellow wire is connected, and the other end to the 5V pin where the red wire is connected (Figure 2).

## Assemble the Main Board

To assemble the main board, insert the headers that came with the Ultimate GPS Logger Shield into the pins of the Arduino Uno. Seat the Logger Shield on top of the headers, making sure the headers fit into the outermost holes of the shield. You may have to wiggle the shield slightly to get all of the pins to fit, but you should **not** have to force the shield. Solder each of the headers to the GPS Logger Shield. Ensure that the switch on the shield is set to “Soft Serial.”

## Assemble power supply

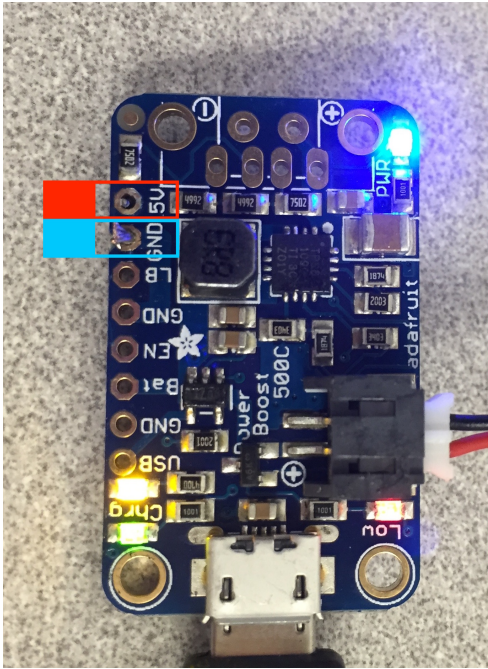


Figure 3: Terminals marked for reference.  
Red is positive (+5v) and blue is GND.

To the PowerBoost board, solder a section of black wire to the ground pin; this will provide ground to the main board. To the 5V pin of the board, solder a section of red wire that is about the same length of the black wire; this will provide the voltage to the main board (Figure 3). Place the red wire into the positive terminal of the barrel connector and tighten the screw to hold the wire in place. Do the same for the black wire into the negative terminal.

With the red wire coming from the battery, cut it approximately in half. Strip both ends of this wire and solder the wire onto the terminals of the toggle switch (Figures 4 and 5, below). Plug the battery terminal into the PowerBoost board; a blue LED on the board should light up when the switch is on. This indicates that the board is ready to use. To connect the main board and the power board, insert the barrel connector of the power board into the barrel connector of the main board (Figure 6, next page).

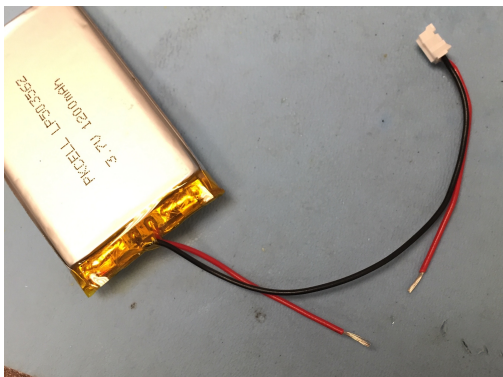


Figure 4: Battery pack with red wire coming out cut in half.



Figure 5: Solder toggle switch into place where wire is cut.

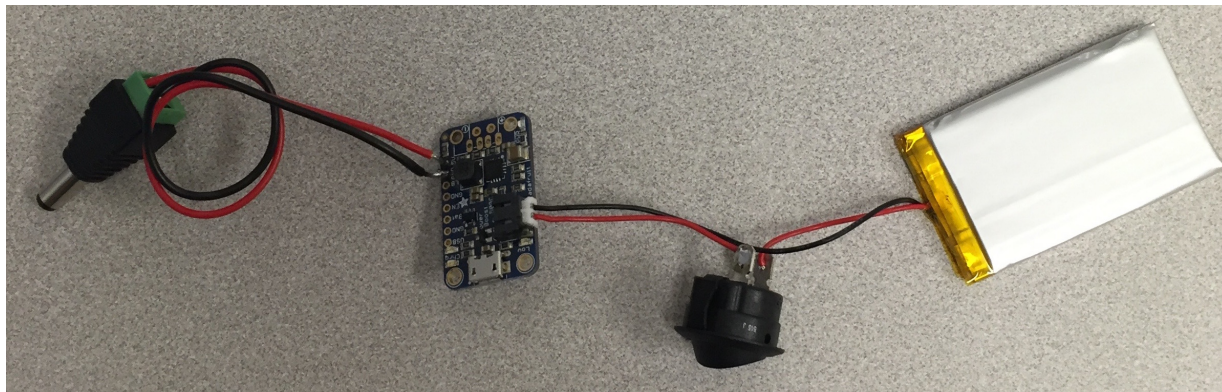


Figure 6: Completed power supply.