LSU OFFICE SPACE - Docs

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**GitHub:** https://github.com/AlexBoudreaux/LSUGreenOffice

**Seat Sensor –**

**Supplies:**

Wemos D1 Mini

100k Resistor (2)

Seat Sensor

Wemos Li-Po Battery Shield

Li-Po Battery 2500mAh

**Development:**

The Seat Sensor is a device running off of a Wemos D1 Mini which is an inexpensive and low power board that works with the Arduino IDE. It is powered by a Li-Po battery, I used 2500mAh during development but any capacity will technically work. The Arduino IDE is the program that we will use to flash the Arduino IDE. Besides the code in the GitHub, the IDE also needs some configuring to be able to flash to a Wemos.

Follow this tutorial to set up the Arduino IDE to be able to flash ESP 8266 Boards.

<https://randomnerdtutorials.com/how-to-install-esp8266-board-arduino-ide/>

The flash settings need to be set to the board “LOLIN (WEMOS) D1 R2 & mini”

The Wemos board is connected and soldered with its battery shield with the connectors that are provided with the shield. The correct pins needs be lined up from the Wemos to the shield (ex. 5V to 5V, D1 to D1).

The Wemos board has the seat senor connected to it. Connect the seat sensor positive wire (green wire) to 3.3V pin and negative wire (black wire) to D1 and then a 100k Ohm resistor from D1 to Gnd. This resistor allows gives the proper impedance to turn the analog signal coming from the seat sensor to a digital signal that works well enough in our case. The Wemos also has a wire (white wire) connecting Pin D0 to RST pin. This connection allows the deep sleep function to work that is described in the code. **Important**: The wire connecting the RST pin to D0 must be disconnected for flashing the Wemos board or the IDE will give back an error during upload and then the wire must be reconnected once the code has been uploaded.

Heat Shrink and electrical tape have been added in certain location like wire connections.

Wemos Diagram:

A picture containing electronics, indoor, circuit, scissors

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The battery shield that will be connected on top of the Wemos board is where the battery is managed. The shield will handle the charging and discharging of the battery. In the picture, a 100k Ohm resistor is connecting A0 to the Positive terminal of the Li-Po battery. This allows the Wemos to read the voltage across the battery to roughly measure the battery percentage left on that Li-Po. No Li-Po could be found that had the same plug size as the connector on the battery shield so the battery needed to be hard wired. Positive to Positive, Negative to Negative.

Again heat shrink has been added to the connections. The positive terminal is not an actual pin so be cautious soldering to it.

Battery Shield Diagram:

A picture containing text, indoor

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**Smart Plug -**

**Supplies:**

Sonoff S31 Smart Plug

https://www.amazon.com/s?k=sonoff+s31&gclid=Cj0KCQjw5PGFBhC2ARIsAIFIMNeBoj55huYJPqTQzWsYgHFgUPDO7Av-FxdggsvAnR\_y65epKh4jApMaAoHsEALw\_wcB&hvadid=248961862744&hvdev=c&hvlocphy=9025161&hvnetw=g&hvqmt=e&hvrand=3568863974759517183&hvtargid=kwd-410443526340&hydadcr=24709\_10080870&tag=googhydr-20&ref=pd\_sl\_57o8ljvklb\_e

Flashing Board

htt<ps://www.amazon.com/Adapter-Serial-Converter-Dev>elopment-Projects/dp/B075N82CDL/?tag=adventurouswa-20

Mini USB Cable

**Development:**

The smart plug comes from the factory with default software running on it but we are going to replace it with our own code by flashing it. To flash this device, Pry off the gray cover on the end. Slide off the two rounded corner pieces to reveal the 3 screws. Unscrew the 3 screws. Lift off the cover. There are no through holes. You can solder a piece of header or you can fabricate something using pogo pins and just hold it for the duration of the flashing process. But, be aware that can get tiring if you need to do it multiple times. The pads are labeled, you need VCC, RX, TX, GND. There are two others that also have RX and TX on them. The ones next to the GND pin are not used for flashing. Connect to your serial converter and 3V3. 1. You need to press and hold the silver button before applying power to put into bootloader mode so you can flash the device.

To flash the sonoff smart plug in the Arduino IDE, the settings need to be configured for the “Generic ESP8266”.