

Team UV

Repository: https://buffet.cs.clemson.edu/vcs/u/sbabatu/team_uv/

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Testing

Overview

To ensure the functionality of our system we plan on testing components both individually and as a whole. In addition, we would like to test not just our custom hardware but also the parts we ordered.

LED lights were added to each of the boards to ensure that, at the very least, they were getting power. This will be a quick indication of whether the boards are functioning at a basic level when we receive them because by attaching the custom boards to a power supply we can see if the LEDs turn on.

In addition, there are input pins on each of the boards to make it easy to attach the lithium ion batteries. One of the input pins is for the positive end of the battery and the other for the negative end.

Testing will proceed as follows.

Custom Board

It is of paramount importance to ensure that there is no short circuiting occurring between the traces on the board. To check for this we will carry out an extensive continuity test on the copper traces. This will enable us to detect any form of discontinuity or short circuiting across the copper traces. The Multimeter will be set to continuity and the probes placed on different sections of the custom board. The additional pin headers on the custom board will help in checkpointing the voltage level on the associated component part. This will ensure a seamless connection to the breadboard while troubleshooting specific parts.

LED Bars

In order to avoid soldering multiple times we will test the LED Bars before attaching them to our board. This will be accomplished by wiring the LEDs through a breadboard. Each LED on the bar is individual so each one will need to be checked separately; in

addition, we will need to attach the appropriate resistors to the board as well which will have a resistance of 330 ohms. The power supply will be the lithium ion batteries we will be using for the final product.

Voltage Regulator

Because the voltage regulators will need to be attached to the custom boards to complete the circuits we will check the boards voltages after they are attached.

Switch

Much like with the LED Bar we will attach the switch to a breadboard (with a power supply) and put a single LED light in series with it. If we are able to switch the LED on and off then we will know that the switch is functioning properly.

UV Sensor

We will first test the UV Sensor by attaching not to our custom board but our red boards instead. This is so that we can see what kind of output we can read from the sensor in an environment that we can easily change the program running. The sensor will be attached to the redboard using wires (not soldered). We will try exposing the sensor to different levels of UV radiation i.e.:

- Outside in full sunlight
- Outside in the shade
- Outside at night
- Inside during the day

Once we are confident that the sensor is functioning properly, the custom board is working properly, and the voltage regulators are working properly we will solder it to our custom board. We will make sure that the sensor is outputting values and that the values increase in higher sunlight exposure and decrease in lower exposure.

Radio

From using the radios in class activities we should already be confident that they are functioning properly however we will attach the two we will be using to two different redboards and send messages (one as the receiver, one as the transmitter) ensuring their correctness. Then, each radio transmitter will be attached to one of the greenboards before the greenboards are attached to our custom hardware.