Threshold: Deliverable #4 Test Document

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https://github.com/oduggan21/ThresholdDevice.git

Introduction

This document will outline the testing plan for the Threshold custom printed circuit board. Our testing strategy aims to verify the integrity and functionality of our PCB. It will cover general hardware tests and component tests.

Initial Inspection and General Testing

We will begin with a preliminary visual inspection of the custom PCB upon arrival. The objective of this visual inspection will be to detect obvious defects present in the board, such as misaligned components, soldering issues, or potentially damage that occurred during shipping. The procedure will be as follows.

Begin by carefully removing the board in an appropriate environment. We will then use some sort of magnifying glass to inspect solder joints and component placement. Then, we will examine the board for any obvious damages, such as scratches. Next, the silkscreen will be examined to ensure that the printed board matches our schematic. After this, we will do a more in depth examination, inspecting through-holes and other connectors present on the board.

Following the visual inspection, we will use a multimeter to test power rails for short circuits. This can be done by using the continuity function on a digital multimeter, or directly measuring the ohms between the VCC and GND, for example. Next, we should also check that voltages are correct on our power rails. These voltage readings should fall within a certain tolerance, such as plus or minus 5% of the expected value.

Component Testing

Before proceeding with any sort of soldering, our planned components should be tested. For instance, our MyoWare 2.0 Muscle Sensor can be tested for basic functionality by connecting it to a laptop, and ensuring that the ENV LED light turns on. We will likely use an Arduino for basic testing purposes, but this could change. After testing general functionality of our sensors and other components like our LEDs and LCD screen, specific functionality can be tested. In the case of the muscle sensor, we will ensure that the ENV LED functions when detecting muscle movement.

From there, our testing will consist of small software tests that will be used to ensure that our communication protocols (BLE) function, and eventually that our components are able to work with our microcontroller.