ECE 411
Group 4
10/15/2022

Practicum Homework #3: Product Design Specification (PDS)

Executive Summary / Concept of Operations

- Our device is a handheld decibel meter. It measures the loudness/noise level in an enclosed space and determines if it is compliant with OSHA standards (85 dB). It will be used by any technician. It should have an easy to use interface and will use an LED screen to display the decibel level.

Brief Market Analysis

- The intended customers are professionals and organizations that want or need to be compliant with OSHA standards.
- There are many competitors in this space. There are large companies like Reed and Grainger as well as tens of smaller companies that sell on Amazon. There are also free and paid apps that use the phone microphone as a decibel meter
- The main issues we found are that larger companies only offer very expensive ($100+) decibel meters with multiple features like humidity sensors and temperature sensors that may not be necessary for specialized operations. The cheaper options are plagued with calibration issues as well as the inability to work with higher decibel ranges. The phone apps are limited by the quality of the phone microphone.
- Our product is different because it will have high accuracy and a large decibel range but won't be overloaded with unnecessary features that would make it too expensive.
- We think this product should be $50 because we estimate this product will cost $30 to produce so we will get $20 in profit.

Requirements

- Must be able to function up to 100 dB
- Must be portable
- Must handle temperatures between 68℉-76℉ (OSHA recommended worksite temperature)
- Must have a display
- Should measure temperature
- May measure brightness
- May use a higher fidelity display (like OLED)

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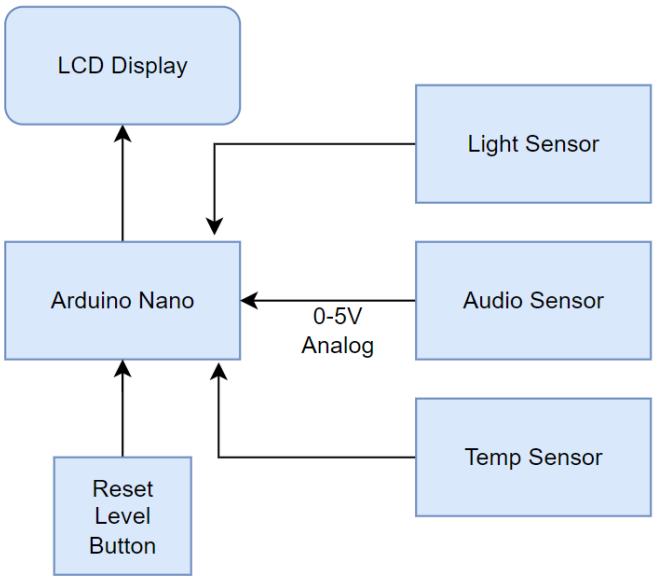
System Architecture



Design Specification

- Noise sensor with a working range of 0-124 dB
- 2 by 16 backlit LED display
- Arduino NANO Every microcontroller
- 8+ hour battery life