



Water Bottle Filling Station

By Team Auto H₂O

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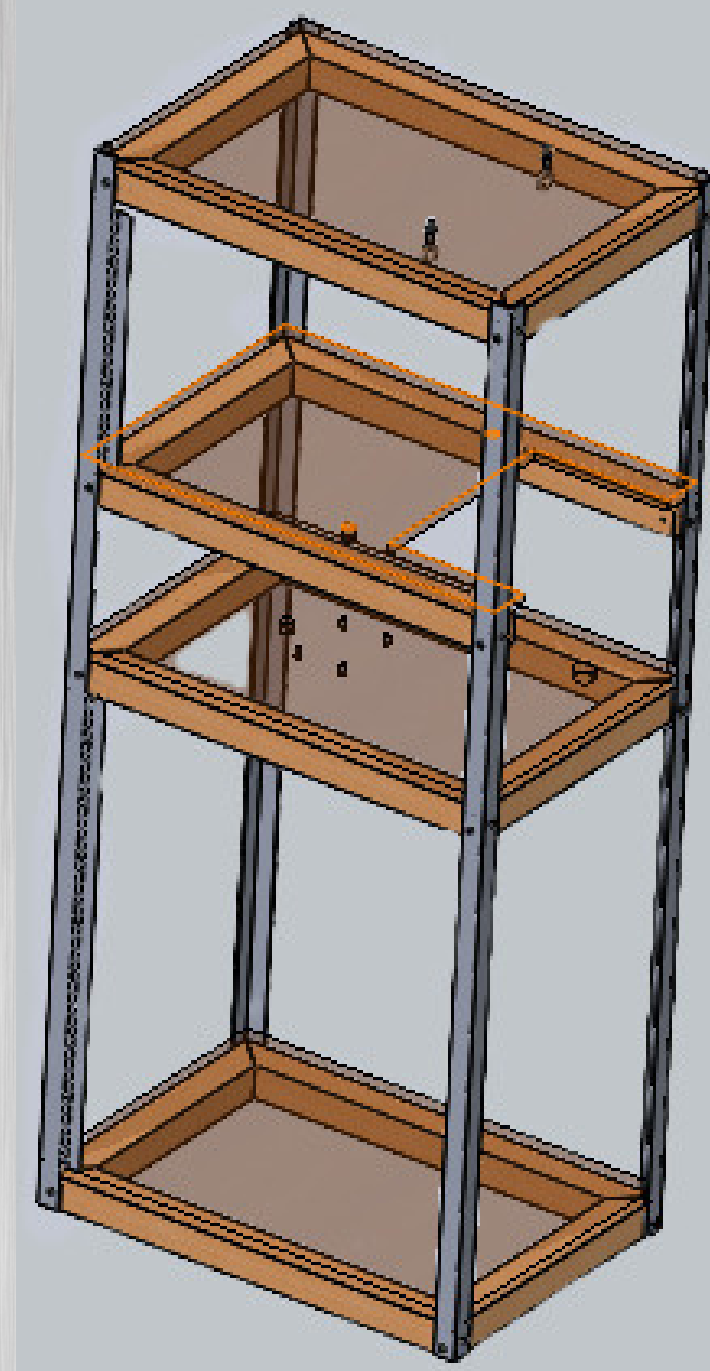
Problem Statement

Deliver a portable, automatic water bottle filling station using an acoustic method.

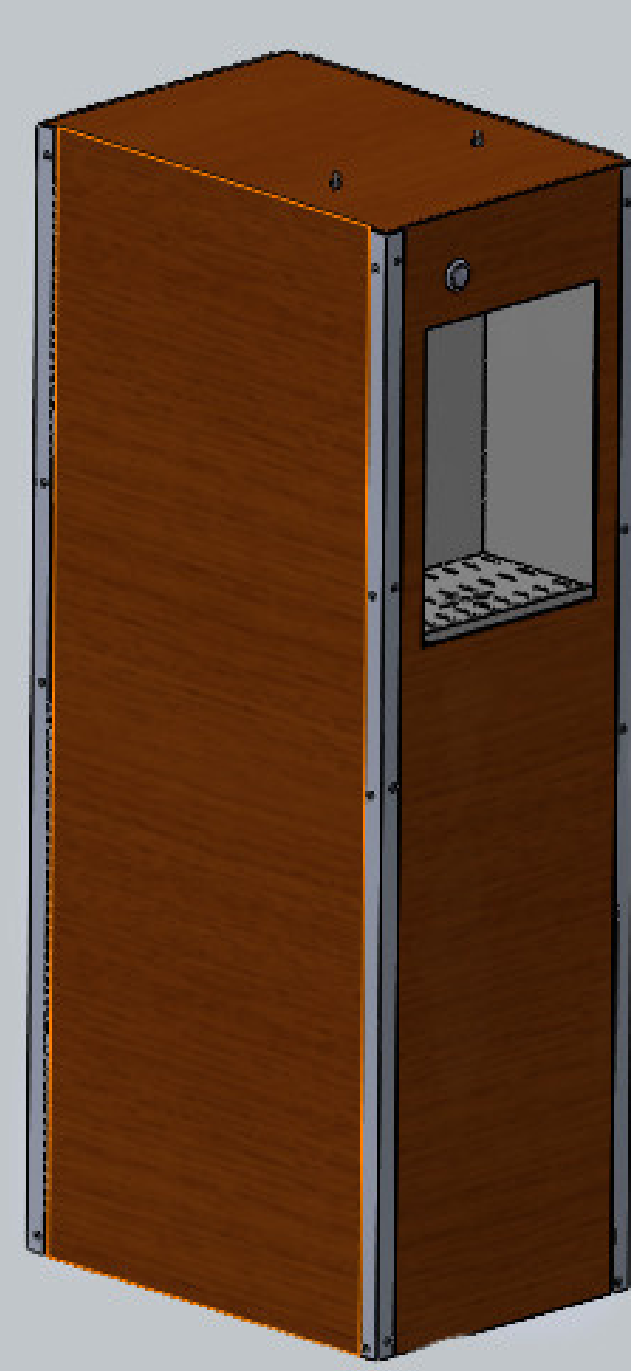
Project Overview

Drinking water is a valuable resource. Reusable water bottles are refilled often and user error can lead to water spillage and waste. This refill station would require the user to place a bottle in the fill zone. The water starts to flow once the bottle triggers the infrared sensor. A microphone detects a predetermined rate of change in the cavity resonance frequencies. Next, a microcontroller shuts off the flow of water. This portable ADA compliant design makes it easier for users and reduces water wasted.

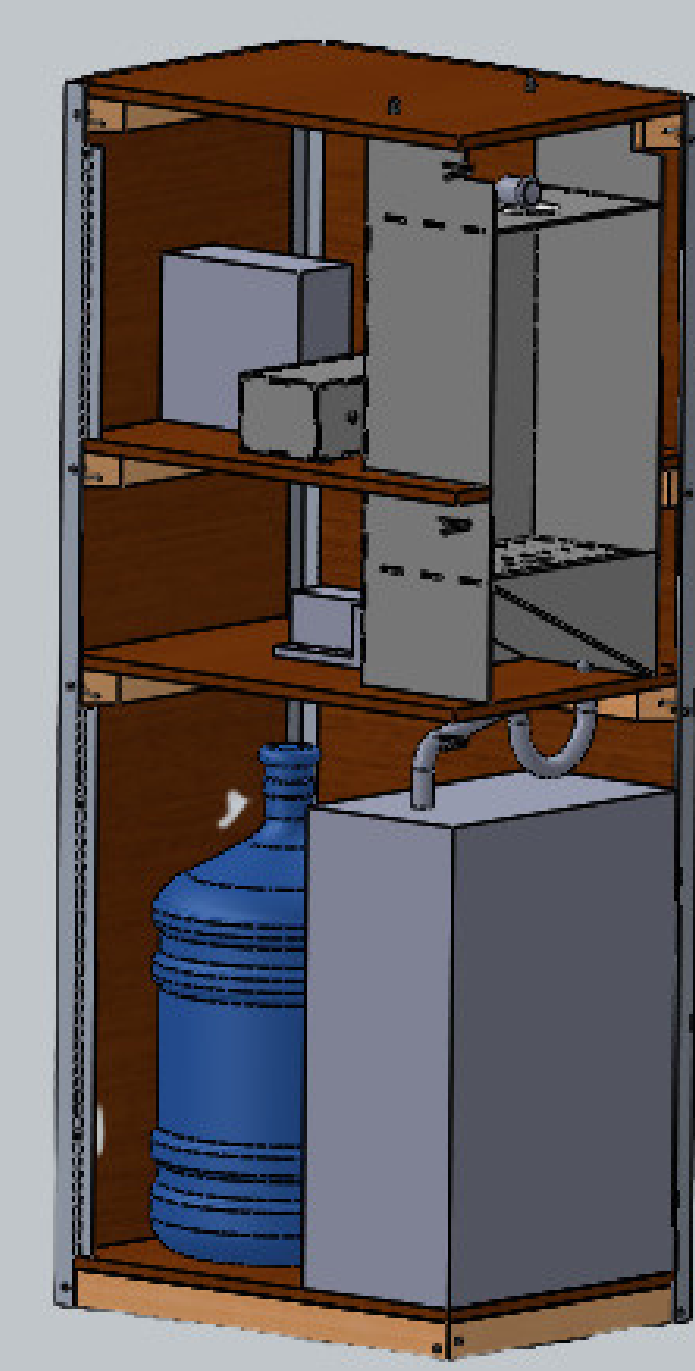
Final Product



Framing
Transparent
View



Full
Assembly
View

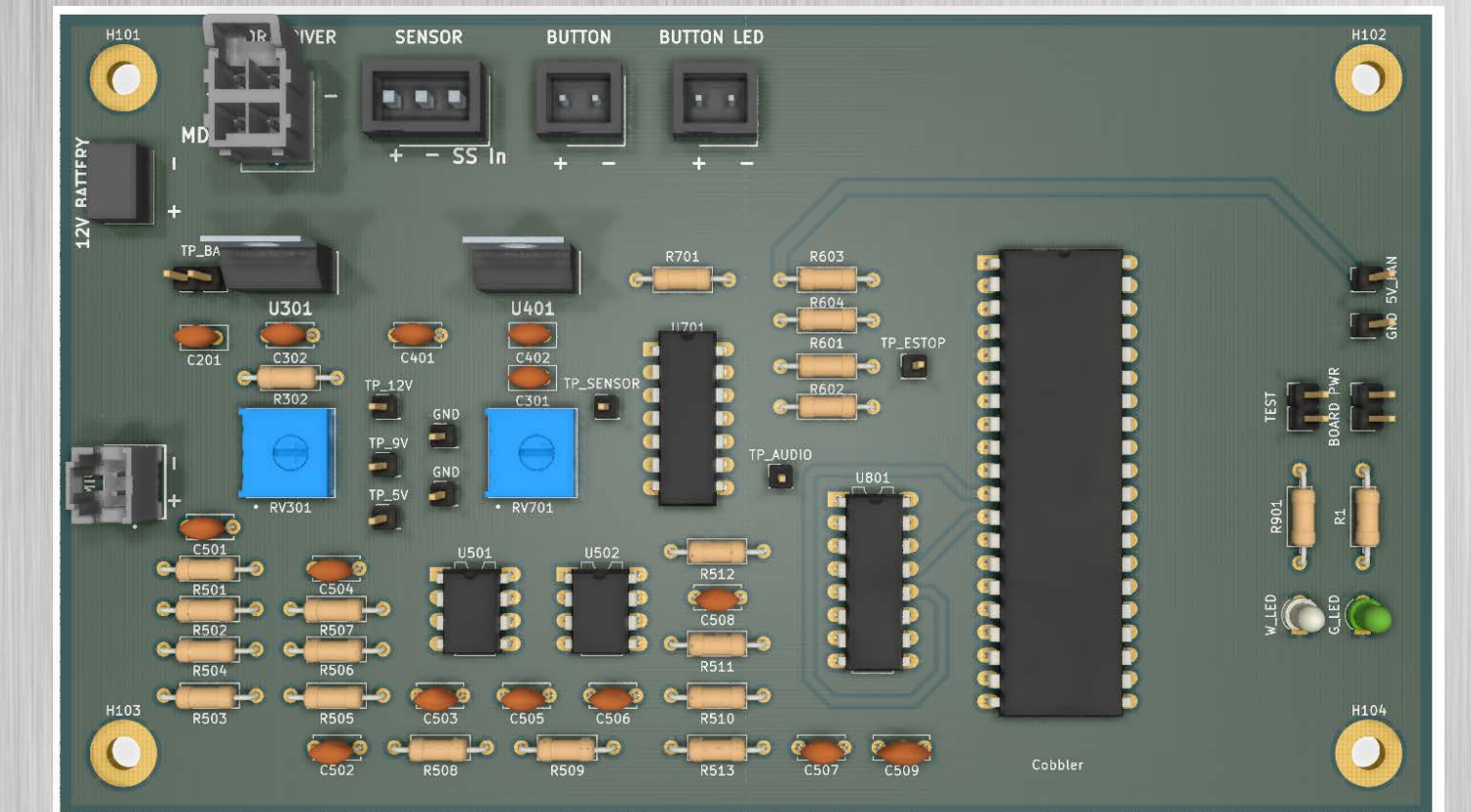


Full
Assembly
Internal
View

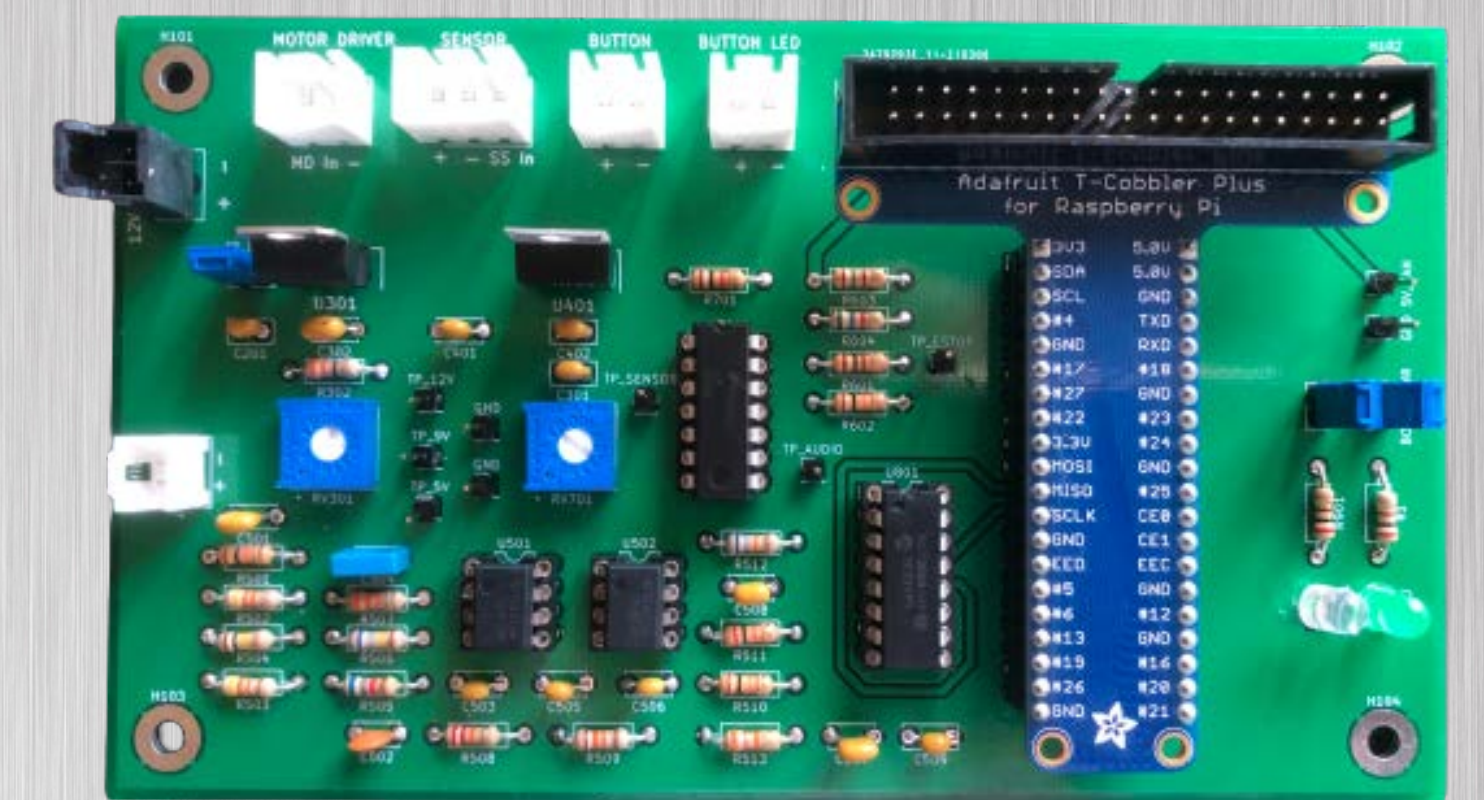


Exterior
Branded
View

PCB Design



KiCad Rendering of PCB



Final Soldered PCB

Requirements

- Uses acoustic signal processing with microprocessor
- Accommodate acoustic interferences
- Automatic start and stop for water bottle filling
- Constrained automation for reusable, non single use water bottles only
- Bottle volume constraint 20 oz - 40 oz
- Portable assembly
- Dispenses potable water from internal water supply
- Safety (electrical, slip, spillage)
- Splash resistant electrical components
- 12V DC
- Self funded

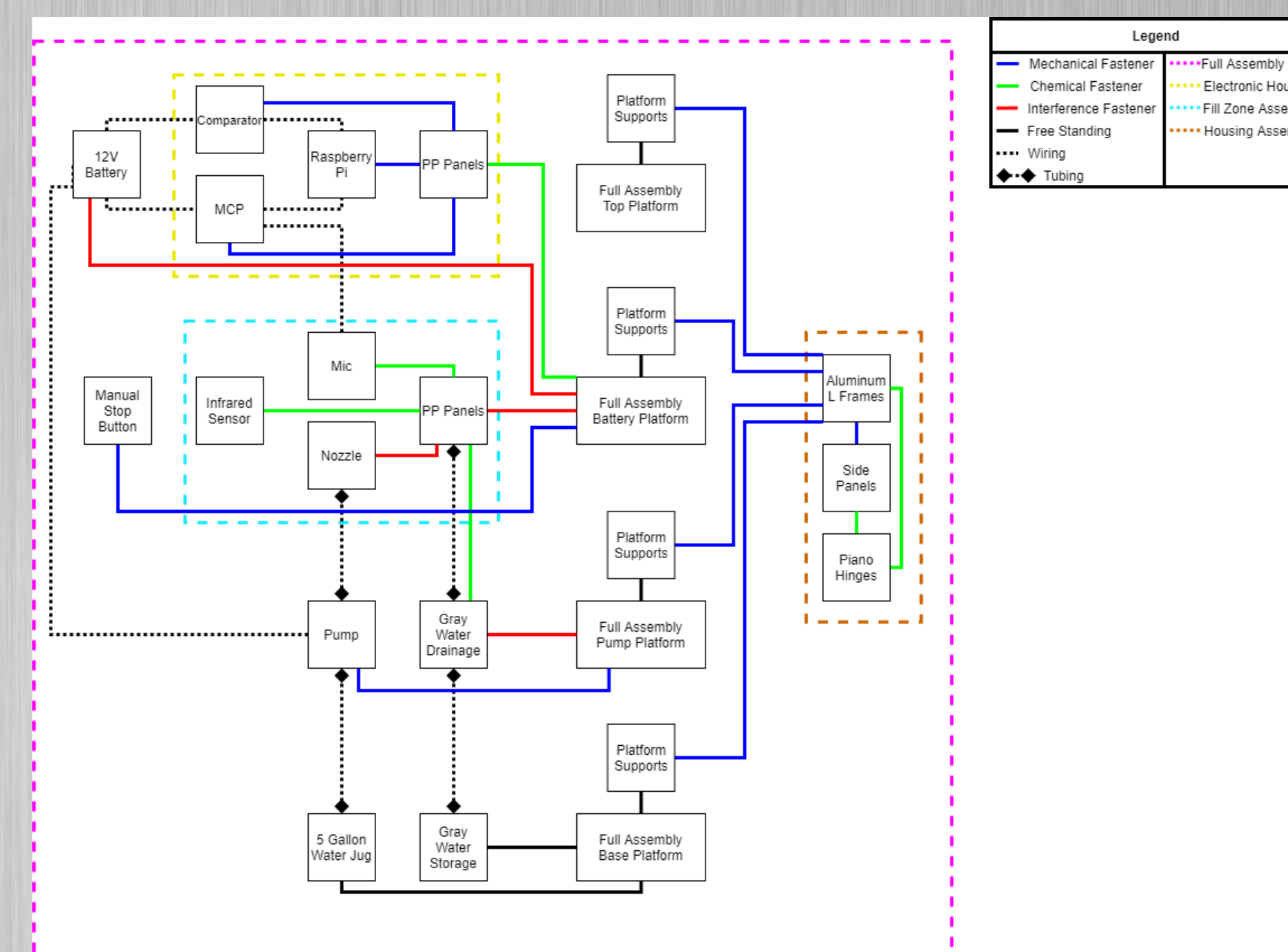
Device Dimensions

- | | |
|--------------------|----------------------|
| Overall Dimensions | Fill Zone Dimensions |
| • Width 14.25 in | • Width 9.75 in |
| • Depth: 20.25 in | • Depth: 8.75 in |
| • Height: 48.00 in | • Height: 13.63 in |
- ADA compliance
- Operable parts are between 15 and 48 inches.

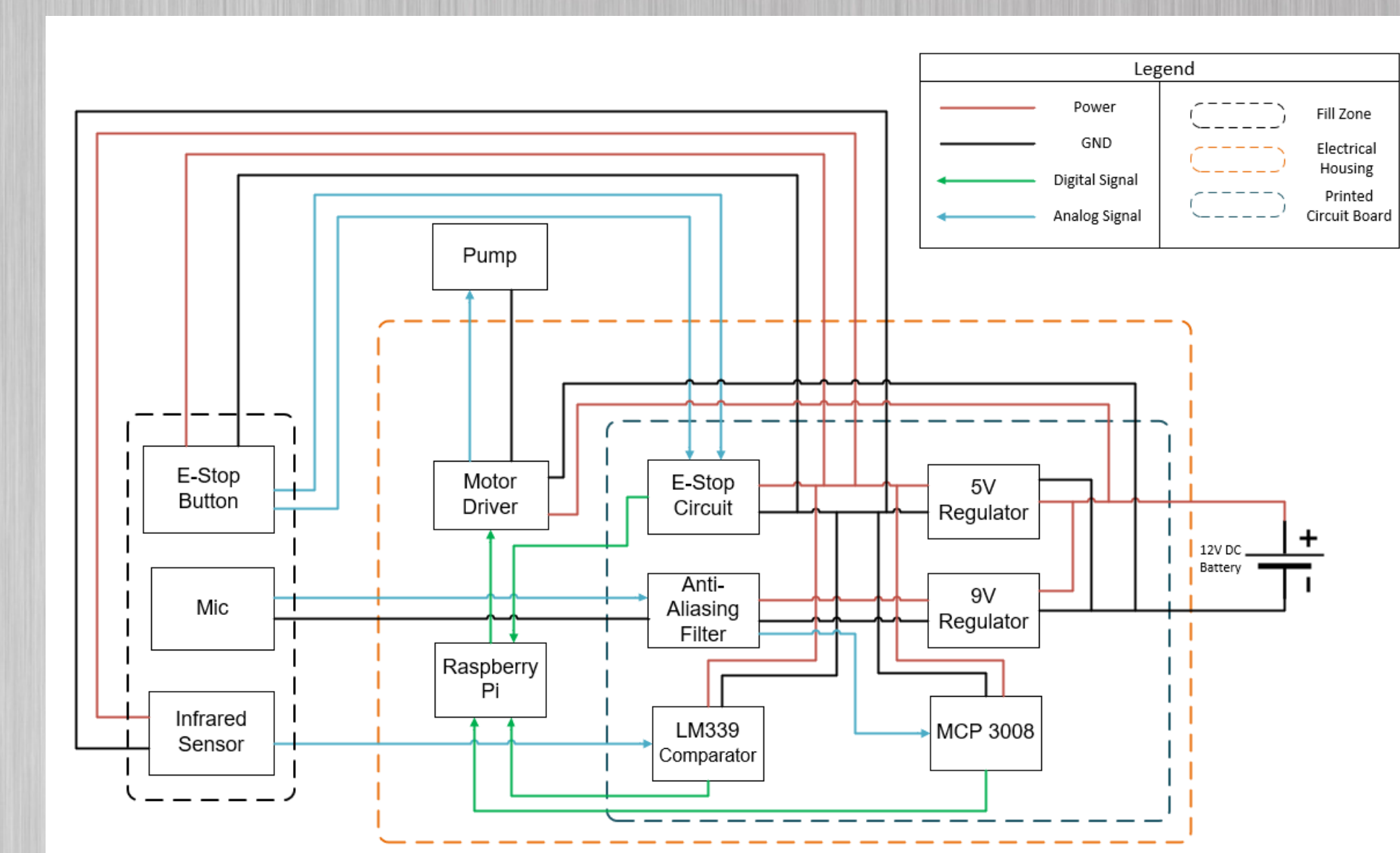
Compatible Bottles

- Reusable
- Volume: 20-40 oz
- Material: Glass, Plastic, Metal
- Standard Geometry: Bottle with Neck

System Level Diagram



Subsystem Level Diagram Electronic Housing Wiring Diagram



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