

AVIVA

NON-ROV DEVICE DOCUMENTATION

Geneseas' newest vertical profiling float, *Aviva*, uses a buoyancy engine and depth sensor to autonomously perform vertical profiles while collecting pressure and depth data through its Bar02 pressure sensor. *Aviva* is built from a clear PVC pipe with a 102 mm outer diameter, sealed using cap rings and stainless steel clamps, with a 25 mm rubber stopper acting as a pressure release. Printed resin rings ensure a secure fit. Compared to *Geneseas'* previous vertical profiling floats, *Aviva* replaces the syringe-based buoyancy system with a compact bi-directional water pump, improving response speed and reducing size. Additionally, the batteries and electronics were moved to a combined electronics chamber, improving accessibility.

Aviva begins each mission at the surface before diving to 2.5 m, where the control algorithm adjusts buoyancy by expelling water to maintain depth within the allowable range. It then manages buoyancy to ascend to 0.4 m and hold position before resurfacing. At the surface, *Aviva* transmits pressure and depth data with timestamps to a webpage displaying a depth-versus-time graph. This cycle is repeated twice.

Aviva uses a Raspberry Pi Zero W and a custom Pi HAT to control the buoyancy engine. The Pi HAT distributes battery power to the pump, LEDs, and Raspberry Pi, while onboard LEDs indicate battery and pump status for easier system monitoring.

Overall, compared to *Geneseas'* previous vertical profiling float designs, *Aviva* demonstrates improved reliability, stability, and accuracy through its efficient housing design, precise depth control, and extensive testing and iteration.

Depth	Depth Offset	Speed	Speed Offset	Pump Water
Too High	Negative	Too Fast	Positive	OUT
Too High	Negative	Too Slow	Negative	IN
Too Low	Positive	Too Fast	Negative	IN
Too Low	Positive	Too Slow	Positive	OUT

FIGURE 4: AVIVA LOGIC TABLE FOR SOFTWARE

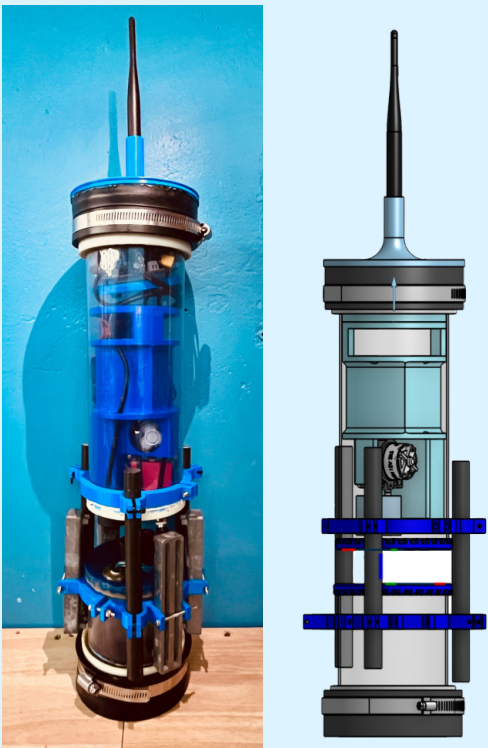


FIGURE 1: AVIVA FLOAT

Idle Load Current	0.150A
Full Load Current	0.40A
Fuse Selection	1.0A

FIGURE 2: AVIVA FUSE MEASUREMENTS



FIGURE 3: AVIVA BATTERY AND FUSE

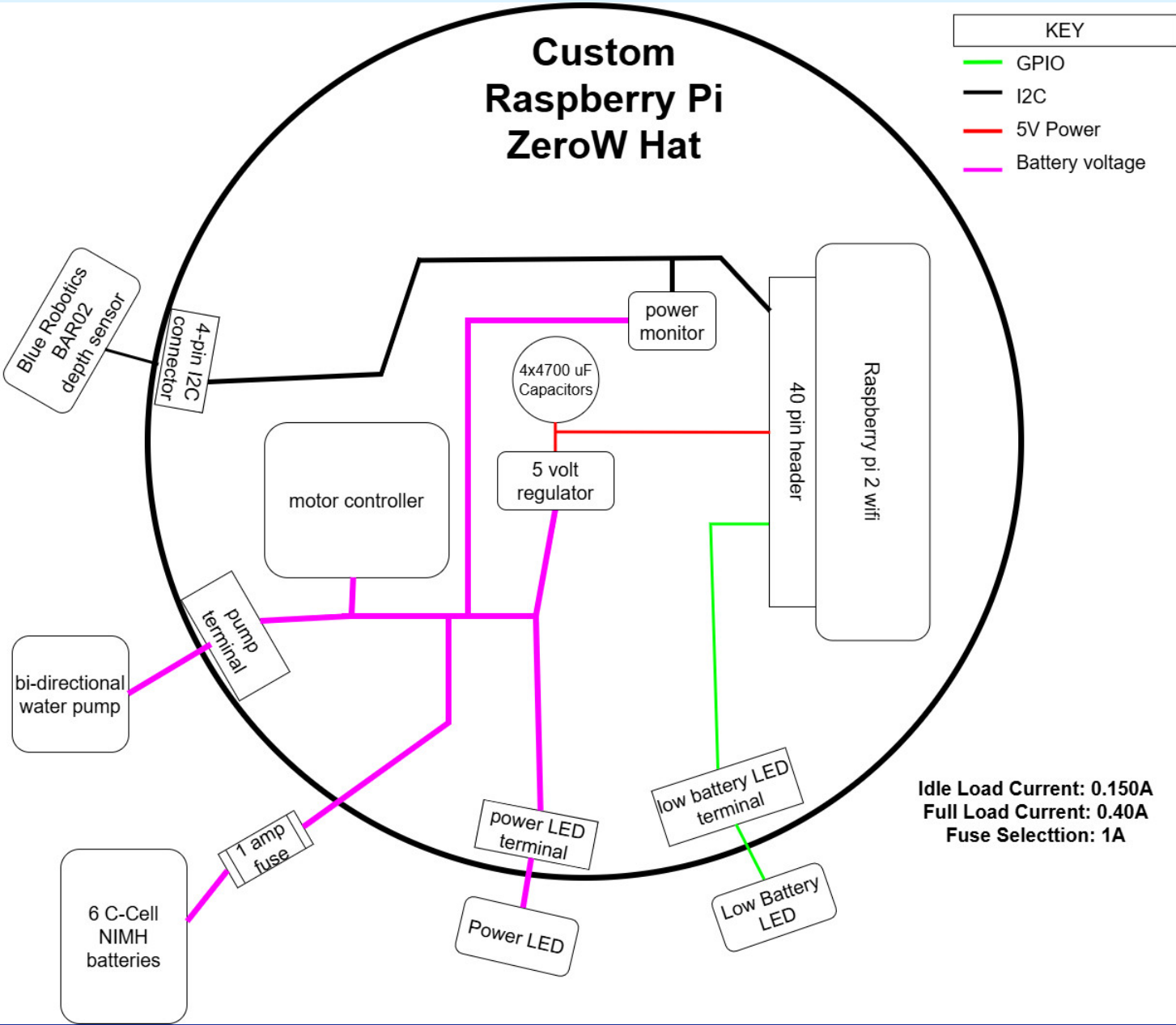


FIGURE 5: AVIVA SID