

Lakeview Sub-Aquatics Task 3

2024 - 2025



The Float

Name: Edgar

Safety Features

Edgar is powered by a 12V NiMH battery pack, chosen to meet both the voltage requirements of the 12V motor and the overall power needs of the system. To safely handle the maximum load current of 1.4 Amps, a 2A fuse was installed within 5 cm of the battery. This close placement minimizes voltage drop and protects against overcurrent conditions, ensuring safe and reliable operation during deployment. The battery pack is also securely housed to prevent damage from water exposure or physical impact.

Buoyancy Engine

Edgar uses a 550 ml syringe to control buoyancy by adjusting the volume of water within it. This is achieved through a 12V DC motor that rotates a lead screw, which in turn moves a brass nut connected to the syringe plunger. As the plunger moves vertically, it either adds or removes water from the syringe, changing the buoyancy.

Logic

Edgar communicates with a shore-side Raspberry Pi 4 using an Adafruit Feather M0 equipped with an RFM95 LoRa Radio. After deployment, the Raspberry Pi sends a command via LoRa to initiate the float's operation. Upon receiving this command, the float activates its motor and begins collecting data such as depth, pressure, and time, which it stores during the dive. Once enough data has been gathered or a stopping condition is met, the float transmits the recorded data back to the Raspberry Pi using the same LoRa connection. The Raspberry Pi receives, stores, and logs this information for later analysis. Additional commands—such as requesting float status, aborting the mission, or adjusting parameters—can also be sent if needed during deployment.

