MUREX ROBOTICS

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PHILLIPS EXETER ACADEMY NRD DEVICE OVERVIEW, 2024

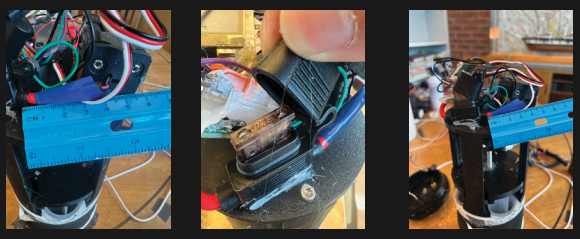
Non-ROV DEVICE SAFETY DESCRIPTION

\\mrxFLOAT//

The vertical profiling float is constructed with a 4" acrylic tube and operated with a buoyancy engine of a continuous rotation servo and lead screws. The mrxFloat is 40cm in height. The top section of the float holds the electronics, which consist of 4 AA batteries, an inline 7.5A fuse, a on/off switch, a 6V to 3.3V buck converter, and an ESP32 LoRa V3. The actuator is screwed through a nut and can extend 10cm vertically. Another ESP32 LoRa V3 transmits and receives signals, consisting of the local time, ROV team number, and pressure information.

mrxFloat Full Picture.
Demonstrating friction-fit end cap.
Photo: Y. Shah

Following safety specification ELEC-NDR-005, a 7.5A fuse is attached within 5cm of the power wire of the battery. Our company reviewed all the speifications of ELEC-NRD-001 through ELEC-NRD-007. The enclosure has been verified to comply with MECH-001 (pressure tested to 5m water column depth). There is a pressure relief system, as the top cap can disengage from the acrylic tube in the event of high pressure.



Compliance to ELEC-NDR-00.5. Photo: B. Huang

The float is deployed by the ROV, then a demo member will transmit a TX packet with the LoRa radio. The syringes intake roughly 50ml each. The two total syringes intake 100ml total, displacing 100cm^3. This causes the float to descend. The inverse is repeated for ascention, while the depth sensor collects data in 5 second intervals throughout.

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