GEARS (General Engineering And ROV Specialists)

Eastwood Schools, Montgomery, AL

Float Design Description

- Designed to collect pressure data during two vertical profiles
    - Transmits data to the Float operator's computer using Wi-Fi
- Uses a buoyancy engine composed of:
    - IP54-rated linear actuator which
    - Drives a syringe to dynamically float and sink the Float in water
- Housing is primarily composed of a 4-in, Schedule 40 PVC pipe (60 cm long)
    - Keeps water out and stands up to intense pressures of up to 1516 kPa
    - Pipe bottom is capped with a 4" to 3" PVC adapter
        - Syringe is potted tightly into a 3" PVC pipe inside the PVC adapter
    - Pipe top is capped by a 4-inch twist-tight plug for easy access to the electronics
    - A pressure release was included to prevent the device from exploding under high pressures.
- Powered by a 12 VDC power pack
    - Composed of 8 alkaline AA batteries
    - Runs through a 5-amp fuse before powering any components
- Onboard electronics are controlled using MicroPython software
    - Uses an ESP32 microcontroller.
    - Linear actuator is controlled by the ESP32 through a reversing relay
    - Pressure sensor is connected to the ESP32 to collect pressure data
    - Waterproof switch is used to activate Float
    - Waterproof LED indicator is connected to the ESP32
        - Informs Float operator of progress during vertical profiles

GEARS 2024 Float "Squid" Photo by Nickolas Schmidt