TECXOTIC

TecXotic's Non-ROV Device

A. Design

The non-ROV float device developed by TecXotic presents a tapered cylindrical design, with a maximum body diameter of 18 cm narrowing to a minimum of 11 cm, and a total height of 60 cm. For optimal balance and stable vertical descent, the mass was deliberately concentrated toward the bottom section. A PLA-printed component was mounted at the top to aid buoyancy, while two structural rings were integrated to allow the ROV to grip and maneuver the device effectively during deployment and recovery.

B. Buoyancy Engine

The buoyancy system employs a combination of a suction motor, a solenoid valve, and an air pump to modulate a pressure bladder that governs vertical movement. Sensor feedback enables real-time monitoring of the float's position within the water column. To ensure continuous operation even in the event of sensor malfunction, an auxiliary backup system —featuring a touch-activated button and an additional buoyancy sensor—detects whether the device is at the surface or submerged at depth.

For 2025, TecXotic has implemented substantial upgrades to the float's buoyancy engine, most notably the inclusion of two baumanometers. These enhancements allow for finer control over internal pressure changes. The membrane-based mechanism inflates or deflates to alter the float's volume and density, enabling more precise control over ascent and descent rates.

C. Electronics and Control

Housed inside the central cylinder, the system integrates an air pump, solenoid valve, and dual baumanometers that operate in coordination to adjust the pressure bag. Accurate depth regulation is achieved through data provided by a Blue Robotics Bar30 Depth Sensor, as well as onboard gyroscopic and accelerometric sensors.

This electronic assembly not only governs buoyancy control but also functions as a communication interface.

It allows the ground station to connect via the pilot and copilot web interface, access telemetry in real time, and remotely initiate immersion procedures.