

Phoenix Robotics Non-ROV Device Design: Vertical Profiler

Device Description

In order to complete Task 3.1: Mate Floats, Phoenix Robotics constructed a vertical profiler. The device uses a buoyancy engine to ascend and descend in the water. The overall unit is in a sealed plastic tube and has a rubber cap for easy access to the electronics. A 9-volt Alkaline Battery is used to power this device, followed by a 5-amp fuse located within 5 cm of the battery. This powers an Arduino Uno, which sends a signal to a Cytron board on when to flip polarity. This causes the servo to turn a screw attached to the syringe assembly. This allows the air valves to turn on changing the profiler's buoyancy by displacing air from one balloon to the next. The vertical profiler is deployed by the Phoenix Ocean Explorer's manipulators to the designated area.

Completing the profiles

When the device is deployed into the designated area, an Arduino board sends a signal to a Cytron control board to send power to the air pumps and power to the air valve. This signal initiates the air valve to release air and the pumps to start which results air to be displaced. Once the device reaches the bottom of the pool, the Arduino board will send a signal to the Cytron to initiate the process again but instead it will take air from the outside balloon and transfer it to the one inside. This process alters the device's buoyancy, causing the device to propel upwards through the water.

Figure 1: Picture of the Vertical Profiler



Figure 2: Phoenix Robotics' diagram of the float's electronics.

