

Phoenix Robotics Non-ROV Device Design: Vertical Profiler Type 1

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 the syringe assembly. This allows movement of the syringe assembly, changing the profiler's buoyancy by forcing water in or out. The syringe has a hole that exits the sealed profiler to allow this displacement to occur. 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 rotate the servo. This rotation of the servo allows the syringe to take on water, changing the buoyancy and causing the device to descend. Once the device reaches the bottom of the pool, the Arduino board will send a signal to the Cytron to flip the servo's polarity, causing the water in the syringe to be pushed out once again. This process alters the device's buoyancy, causing the device to propel upwards through the water.

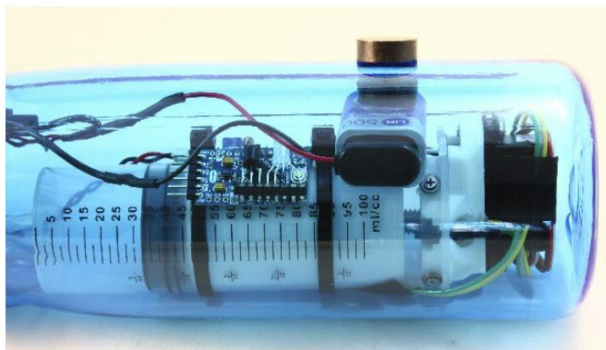


Figure 1: An example of our buoyancy engine design from the Seaglides company.

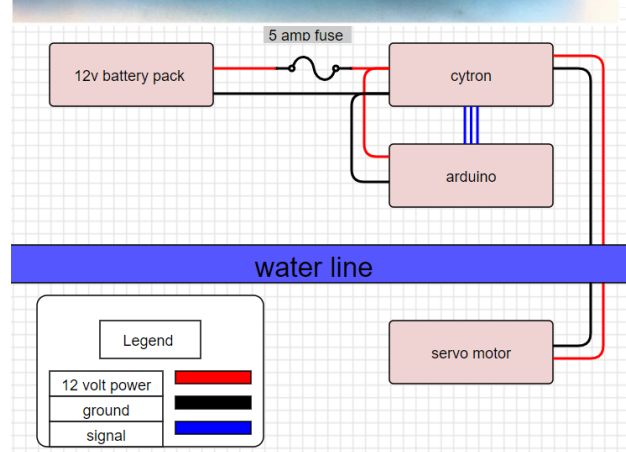


Figure 2: Phoenix Robotics' diagram of the float's electronics.