Non-ROV Device Documentation

Design

Our float was designed with simplicity in mind. To that end, the entire buoyancy system is operated using a single linear actuator run off of an Arduino Nano. The time is kept via an RTC module onboard the float, and communications are accomplished over a WiFi signal.

Operation

Our float is fully self-contained and requires no outside input to function. Once assembled on the surface it is activated, starting a delay to give time for it to be deployed. The float starts in the 'sinking' position, with the plunger drawn in, in order to prevent the pressure relief from releasing due to normal operation. After activation the linear actuator swaps between an extended position for rising and the retracted position for sinking. While surfaced, the float connects directly to the receiver via WiFi to send the time, team number, and profile number.

Buoyancy Engine

Our float's buoyancy engine is powered by a linear actuator that we use to move an aluminum piston. This changes the overall volume of our float, thereby allowing us to adjust its density and move up and down in the water.

Safety

Our float was constructed in order to be as safe as possible from both an electrical and physical standpoint. We use 4 standard AA alkaline batteries for our power, and these batteries are securely fastened to the inside of the float's body with a 1A fuse positioned within 5cm of the positive terminal of the battery. In order to prevent pressure build up we have a 1in wide machined aluminum plug at the top of the float that is free to move and will be pushed out if the pressure inside of the float grows too high.