Cyance 2023 Non-ROV Device Docs

At Cyance we have designed and built a buoyancy engine-powered vertical profiling

Exterior of buoy

float named "Bixbuoy" after our mentor's dog called Bixby. This float consists of a small Pelican case containing electronics, a syringe extending below the case, and a metal casing around the syringe. The casing provides weight as well as protection for the syringe from potential hazards. This casing has additional weights secured on either side of it to achieve the perfect level of buoyancy. The Pelican case contains all electronics, is watertight, and has a pressure release system. The electronics inside of the case consist of an Arduino UNO, a 5V continuous servo, a 5-amp fuse, a radio transceiver, and an enclosed 9V alkaline battery. The battery power first goes through the aforementioned fuse before then reaching the Arduino. The servo communicates its position to the Arduino via digital pin nine. The servo rotates a drive screw which pushes or pulls the syringe's plunger. This changes the amount of water the buoy displaces by sucking in or pushing out enough water to change its buoyancy. To communicate the time and our team number back to the receiver we have a radio transceiver connected to the Arduino. Our receiver consists of a circuit board, Arduino, 9V battery, power switch, radio transceiver, LCD[1] display, and a potentiometer. The Arduino controls the LCD which displays the team number and time transmitted from the buoy. The potentiometer controls the brightness of the LCD screen and the transceiver receives the buoys signal. To activate the system simply toggle the power switch on the back of the battery container, press the reset button on the Arduino, close the case, and place it in the water. The Arduino is pre-loaded with a program that manages the multiple descents and ascents needed as well as

Interior of buoy

communication with the receiver. The receiver can be turned on and off via a switch on the outside. When the buoy is at the surface the LCD should display the time and team number.

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[1] LCD stands for Liquid Crystal Display
Unless stated otherwise all photos are taken by Solomon H