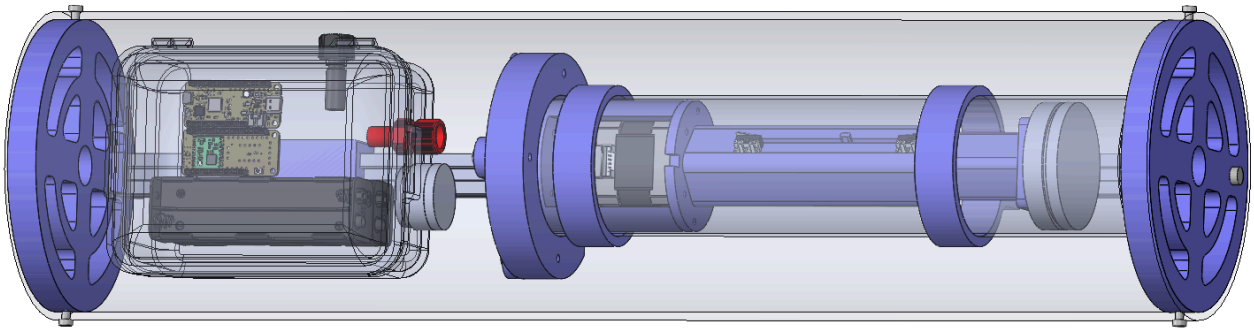
Cabrillo College Robotics vertical profiling float consists of an inner frame that connects the electronics housing and buoyancy engine, and outer shell. The electronics housing contains 16 AA Alkaline batteries with a 3 Amp fuse installed within 5 cm of the positive battery terminal. The batteries are arranged in an 8s2p configuration, which outputs 12V, 2850mAh. A pressure relief hole 2.6 cm in diameter is on the bottom of the housing, covered with an O-ring plug. Additional penetrations exist for a depth sensor and powering the buoyancy engine. The housing and buoyancy engine are mounted to a slotted aluminum extrusion. The pump motor is contained in a separate housing, with machined cylindrical O-ring plugs on both ends. A Nema 17 stepper motor drives a lead screw connected to a piston head to displace water and change the density of the float. Limit switches are used to control the length of travel.



The float communicates with the mission station using an Adafruit RP2040 900mHz LoraWan Featherwing module. An additional LoraWan on the Deckside receives the data, which is then displayed on an OLED screen. The electronics are powered from the battery pack through a 12V to 5V buck converter.