VPF Design Rationale

The Vertical Profiling Float (VPF) the R-Mateys have meticulously designed consists of a waterproof enclosure, carefully designed to shield the electronic components from water, ensuring their dryness. The mechanism for water intake and expulsion is the syringe which is positioned downward and hooked to a tube protruding from the bottom of the waterproof enclosure to prevent it from leaving the water and possibly taking in air. Operated by a linear actuator controlled by a motor controller connected to the Pi, this setup allows the syringe to pump water in and out, thus altering the overall buoyancy.

The Pi, motor controller, and battery supply are stored next to the syringe. Mounted on the bottom of this enclosure is a water pressure sensor, which connects to an I2C converter, subsequently linked to the Raspberry Pi Pico W (RPi Pico). The RPi Pico communicates to the topside receiver via Local Area Network (LAN) using the Hypertext Transfer Protocol (HTTP). The RPi Pico hosts a HTTP page that is dynamically updated with pressure data. The receiver connects to the RPi Pico's LAN page via an internet browser.