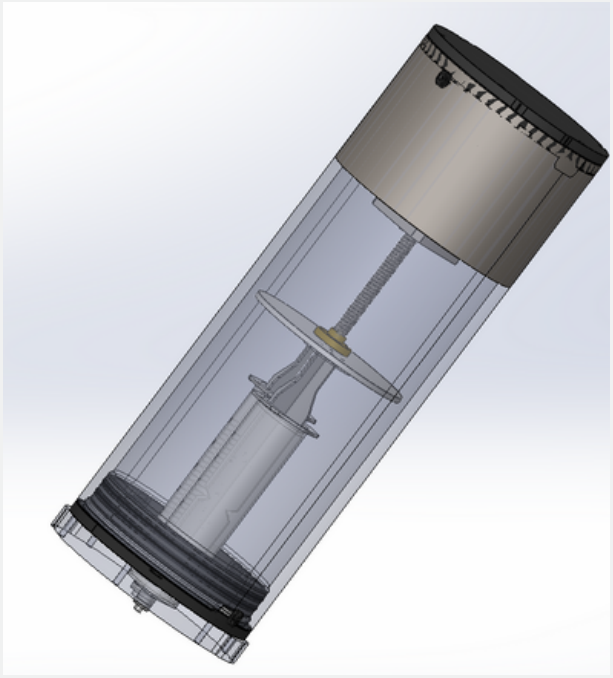
NON-ROV DEVICE
FLOAT DOCUMENTATION

AUV Society, IIITDM Kancheepuram, India

DIMENSIONS
HEIGHT: 33CM
DIAMETER: 4" = 10.16CM

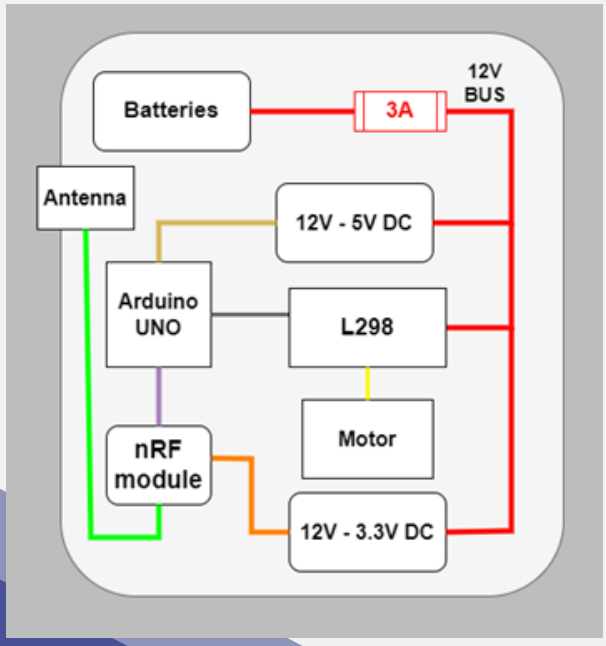


The float developed by Team Nira, is the non-remotely operated vehicle (ROV) device specifically engineered for Task 3, which involves conducting vertical profiling underwater. The float incorporates a buoyancy engine to facilitate its primary function of executing **two vertical profiles** while simultaneously transmitting data to the designated station. Throughout the entire design process, our team adhered to the **"Keep it Simple, Stupid!" (KISS)** philosophy.

After carefully considering various concepts such as the piston-cylinder assembly, hydraulic pump utilization, and pneumatic buoyancy engine, our team ultimately selected the **syringe-piston mechanism**, prioritizing safety, reliability, and simplicity. In this design, syringes are arranged vertically, while the electronic components are positioned at the top for convenient maintenance purposes.

A 4" Blue Robotics hull is used, wherein all electronic components are housed. It is employed because of its transparency, which allows for a **fast visual inspection** of the components inside. The major components include lead screw and its accessories, two syringes, RF module, AAA batteries, 12V geared DC motor.

The default buoyancy of the float is **inherently positive**. However, once a predetermined volume of water is collected, the vertical float gradually starts to descend. This change in buoyancy is achieved by regulating the **inflow and outflow of water** through the syringe, thereby enabling the non-ROV to sink or float as required for profiling purposes. The adjustment of buoyancy is facilitated by syringes, which are controlled by a piston that moves along a **lead screw.**



Our vertical profiling Float is powered by eight 1.5V AAA alkaline batteries connected in series , providing a 12V supply with a 3A inline fuse . A buck converter steps down the 12V DC to 5V dc to power up **Arduino Uno** , which controls a 12V geared DC motor through L298 motor driver (powered from the 12V DC bus) . The 12V geared DC motor actuates the lead screw mechanism. Another buck converter steps down 12V DC to 3.3V DC to power up the **nRF module to transmit data**. The Arduino UNO transmits the UTC time and the company name once the float reaches the surface, for each second , through the nRF transceiver module . The float is completely independent of the ROV.

AUV SOCIETY
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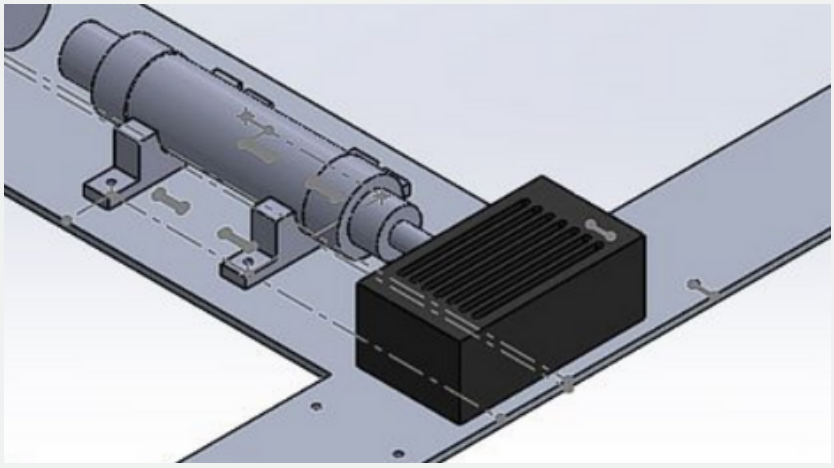
NON-ROV DEVICE

RED BELLY FISH CONTAINER

AUV Society, IIITDM Kancheepuram, India

DIMENSIONS :35MM X 50MM X 90MM

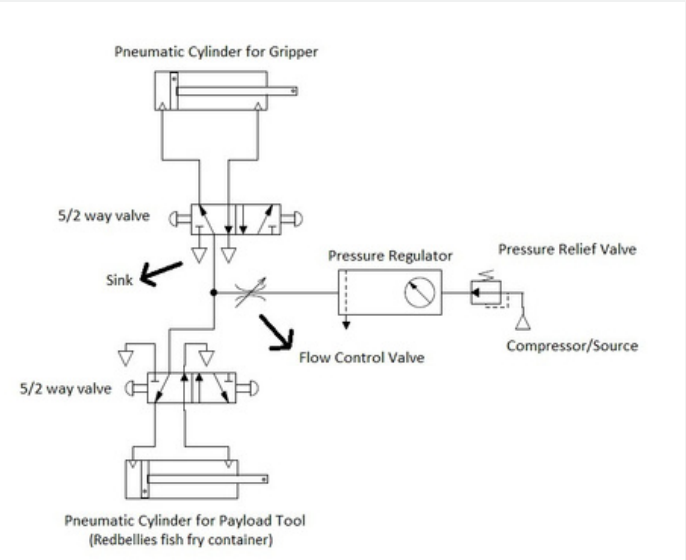
The container, designed by Team Nira, serves the purpose of safely housing the Northern Redbelly Dace fry, specifically tailored for **Task 2.5**, which entails their transportation, acclimation, and subsequent release. This non-remotely operated vehicle (NON-ROV) device incorporates a **pressurized air piston** to facilitate its primary function. Throughout the entirety of the design process, our team steadfastly adhered to the **"Keep it Simple, Stupid!" (KISS)** philosophy.



This container is a specially designed **3D printed box**. The box, made from **PLA** filament sourced from eSun, has dimensions of 35mm x 50mm x 90mm. It serves the purpose of holding the "redbelly fries" from the station to the target site.

The mechanism of the box is similar to that of an **inverted matchbox**. When the box is pushed out, the fries contained within it are released. This mechanism ensures efficient and controlled dispensing of the fries during the task execution.

The box itself is constructed with a thickness of 5mm, providing sufficient strength to withstand the force exerted by the **pneumatic actuator**. This ensures the **durability and reliability** of the box during operation.



To promote the acclimatization of the fries with their surroundings, the box features **numerous slits**. These slits allow the passage of water into the box, facilitating the exchange of water and aiding in the process of acclimatization. This feature ensures a more **seamless integration** of the fries into the underwater environment.

By utilizing this 3D printed box as a **payload tool**, we enable the successful execution of the "redbelly fries" task in a controlled and efficient manner. The box's design, strength, and water-permeable properties contribute to the overall functionality and effectiveness of the underwater robot during its operations.

MATE ROV COMPETITION

IIITD&M Kancheepuram