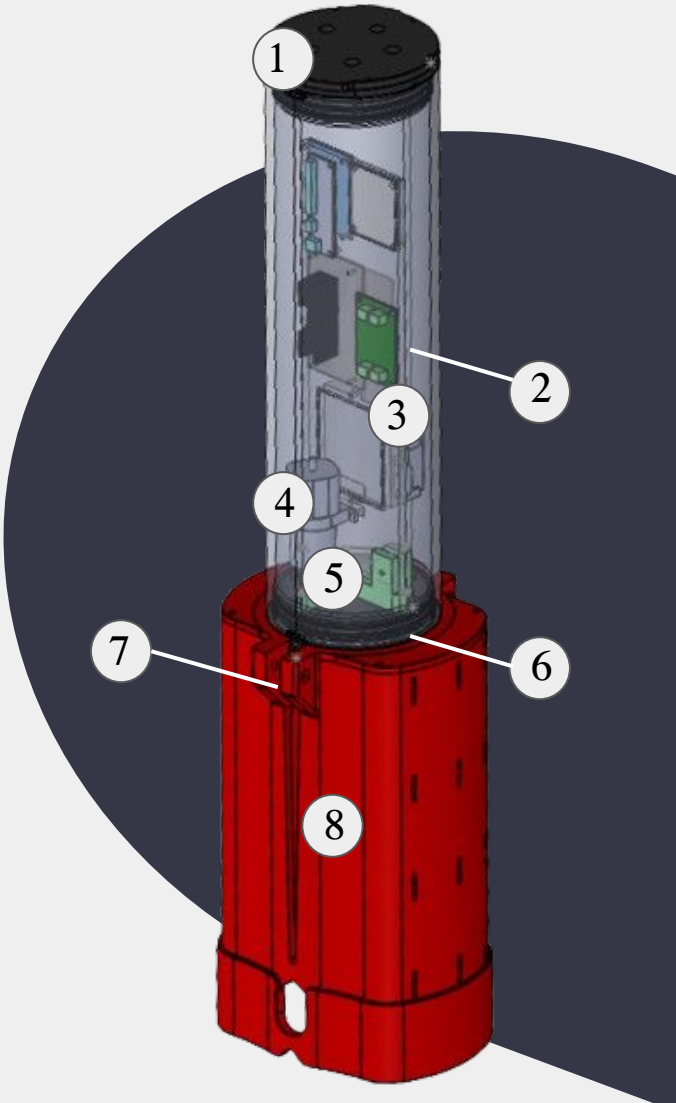
Lancer Lumineers' Zeus (Fig. 1) is a vertical profiling float designed to complete two cycles of descent and ascent within a body of water. This movement enables the device to transmit valuable data including travel time, depths reached, and water temperature, to the Lancer mission station. Zeus is equipped with a 12V battery pack, which powers a 5V regulator board, an Arduino Nano, and a driver board. The regulator board supplies power to a real-time clock (RTC) module, analog pressure sensor, pressure-humidity-temperature (PHT) sensor, and RF transceiver antenna, while the driver board delivers power to the 3-way air valve and pump. A 2A fuse attached to the battery and 12V distribution board protects all internal components.

Zeus utilizes an air pump-bladder buoyancy system to enable its descent and ascent within water. The air pump remains inactive during descent, allowing the natural weight of the float to carry it downward. As the float descends, the PHT sensor gathers temperature, pressure, and humidity data, which is stored in the EEPROM along with RTC data. Upon reaching the bottom of the water body, a signal prompts the air pump to inflate the bladder with air. This increases the device's overall volume, creating positive buoyancy and causing it to float. Once the float reaches the water's surface, the radio transceiver sends all collected data to the Lancer mission station.

Major Components:

1. RF Transceiver Antenna
2. PHT Sensor
3. 12V Battery Pack
4. Air Pump
5. 3-Way Air Valve
6. Analog Pressure Sensor
7. Bladder
8. 3D Printed Bladder Cage

Quick Specs:
Height: 71.9 cm
Diameter (with Cage): 17.6 cm
Mass: 2.70 kg



(Fig. 1) Zeus