



# AUV System overview

The Hydromea VERTEX AUV System is a fleet of small, portable and highly integrated autonomous underwater vehicles for water quality measurements, specifically designed to operate in groups of 10 or more vehicles.

Each VERTEX AUV has just 7 kg mass and 70 cm overall length, making it easily deployable by hand, from shore or boat. Five brushless thrusters allow it to precisely control its heading and orientation in three axes and follow any 3D course, from horizontal transects to vertical profiles, and precisely control and hold depth at any speed, even when stopped.

The sensor payload bay can carry up to 7 different sensors from YSI for a large range of physical, chemical and biological parameters. Different sensor payloads can easily be integrated on request, and may be available off-the-shelf in the future.

The AUVs are equipped with an advanced distributed communication and localization system. Working together as a group, the AUVs form a decentralized mesh network and act as localization beacons for each other. This provides positioning and connectivity within the fleet without external infrastructure, on the surface and under water.

### Available Sensors: <sup>1)</sup>

Up to 7 sensors can be used simultaneously out of the following list:

- CTD
- Ammonium
- Chloride
- Dissolved Oxygen
- fDOM
- Nitrate
- pH/ORP
- Total Algae (BGA-PC/PE)
- Turbidity

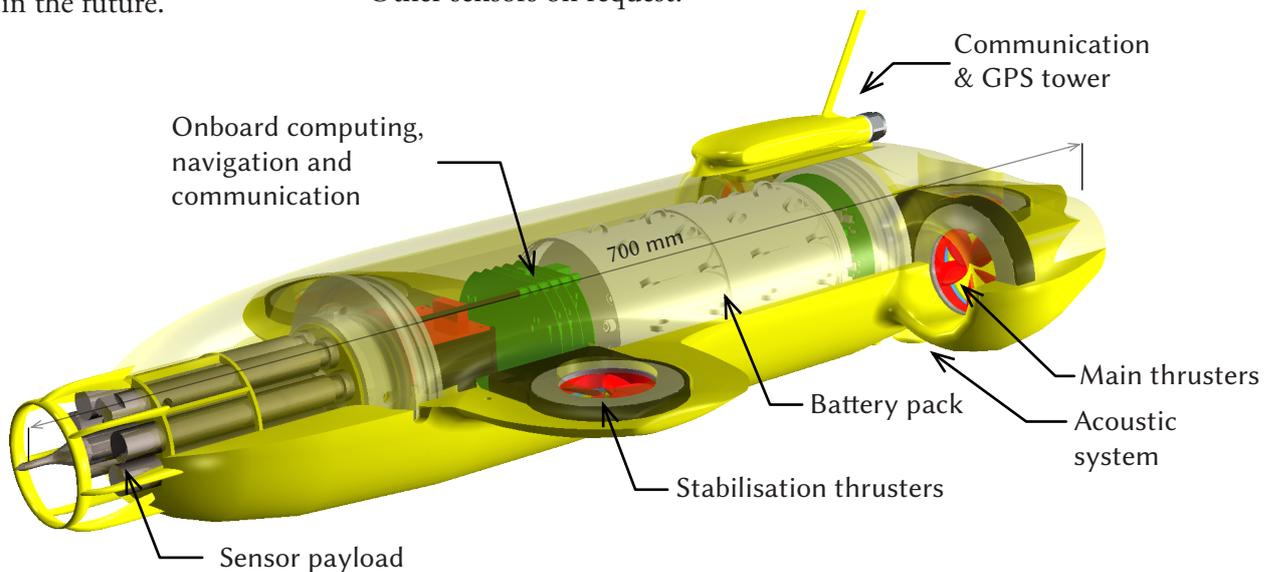
Other sensors on request.



*Ultra-portable with check-in sized suitcase*

### Specifications\*

Max. Depth	300m <sup>2)</sup>
Max. speed	1.5 m/s
Hover capability	yes
Total mass	6.7 kg
Overall length	70 cm
Battery voltage	14.4 V
Battery capacity	160 Wh
Endurance (cruise)	6-8 h
Payload (standard)	1 liter
Weight in carry case	15 kg



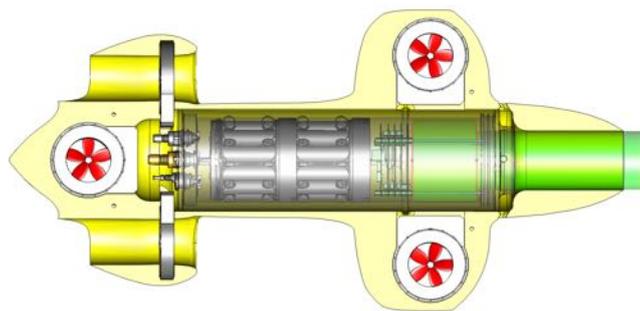
\*) All specifications are subject to change without notice. Performance characteristics are typical values and depend on environmental conditions.

<sup>1)</sup> Please refer to the sensor manufacturer's specifications for sensor characteristics, e.g. [www.exowater.com](http://www.exowater.com) for YSI EXO sensors. All product and company names are trademarks™ or registered® trademarks of their respective holders. Use of them does not imply any affiliation with or endorsement by them.

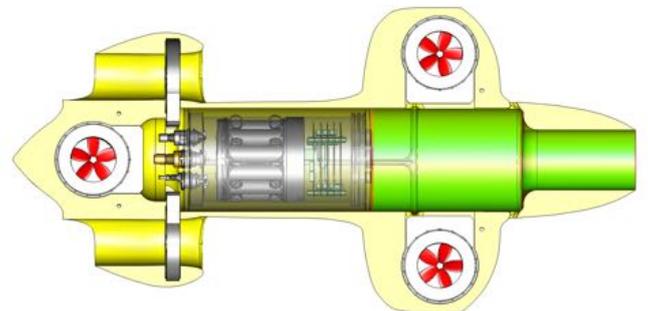
<sup>2)</sup> Max. operational depth may be limited by sensor selection.

# Payload configuration

The modular design of the VERTEX AUV is configurable to integrate a variety of payloads. Hydromea will carry out the initial integration on request and offer ready-to-use payload adapters for selected payloads.



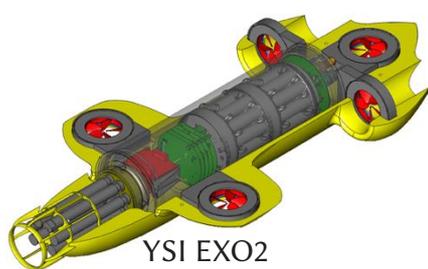
Propulsion/Mechanical	Battery	Ctrl.	Payload
32%	25%	8%	35%



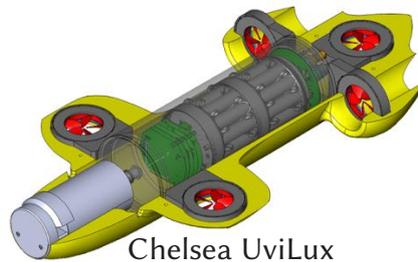
Propulsion/Mechanical	Battery	Ctrl.	Payload
32%	15%	8%	45%

Fig. 2a) Payload bay (standard configuration, 2 battery packs), 1 liter total volume (50% dry, 50% wet)

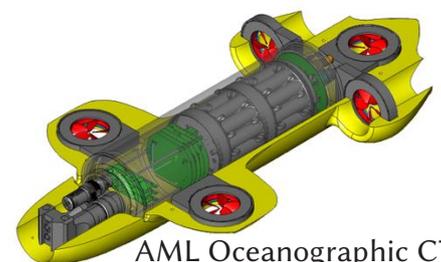
Fig. 2b) Extended payload bay (1 battery pack, reduced endurance) with 2 liter total volume (wet).



YSI EXO2



Chelsea UviLux



AML Oceanographic CTD

Fig. 3) Example Payloads: (Left) YSI EXO2 sonde for up to 8 physical and biological parameters (default). (Middle) UviLux Fluorometer from Chelsea Technologies for hydrocarbons, CDOM, Tryptophan (on request). (Right) Oceanography-grade CTD from AML (on request).

## Applications and Sensing Services

Hydromea's AUV System is particularly suited for applications where spot measurements are not enough, and large volumes have to be covered quickly, such as: environmental impact assessment and modeling, mapping of outflow and dredging plumes, spill and leak discovery and compliance monitoring. The small size of the AUV also allows deployments in hard-to-reach locations (under ice, remote areas, closed reservoirs). Contact us for our services.

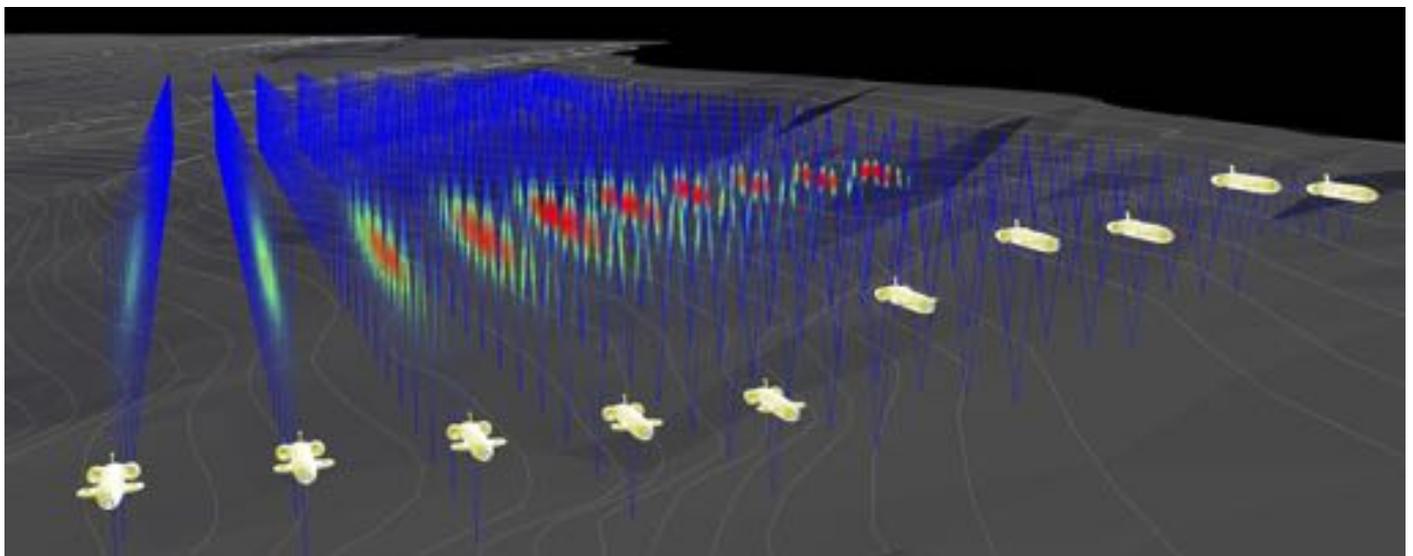


Fig. 4) Application example: Fleet of 10 AUVs cooperating to map an outflow plume (0.5 km<sup>2</sup> in 2 hours).