

INFLATABLE AUTONOMOUS VEHICLES

INFLATABLE Autonomous Surface Vessels (ASVs) represent a novel category of marine robotics optimised for light weight construction, portability and adaptability.

These vessels are designed to address operational challenges across diverse aquatic environments, providing significant advantages over traditional rigid-hulled ASVs. There are numerous technical benefits.

A standout feature is its portability and rapid deployment capability especially for time-critical missions. These vessels are also easy to handle and deploy without requiring heavy lifting equipment. It makes them a choice for operations where mobility and setup speed are essential.

In terms of durability, inflatable ASVs provide robust performance.

Their inflatable hulls are engineered to absorb impacts effectively, reducing the likelihood of structural damage from collisions with obstacles like rocks or piers. This impact resistance is particularly valuable in shallow, debris-laden, or high-risk environments where traditional rigid-hull vessels might sustain more significant damage.

Moreover, the soft, deformable structure minimises the risk of harm to surrounding vessels, infrastructure, or sensitive ecological zones, making them safe for deployment in congested or protected waterways.

Manufacturing costs are generally lower than those for rigid-hulled ASVs due to the use of flexible, lightweight materials. They tend to be fabricated from lightweight, high-strength materials such as Hypalon or PVC composites. Maintenance requirements are minimal, with repairs typically involving straightforward patching techniques that can be performed in the field.

The operational versatility of inflatable ASVs is further enhanced by their shallow draft which enables effective navigation in restricted or shallow waters where traditional ASVs might encounter difficulties. The lightweight hull design ensures good manoeuvrability in dynamic environments, extending their operational range to areas that might be challenging for heavier, rigid ASVs.

Deflated, these vessels occupy minimal space and can be packed into compact cases, reducing storage requirements and enabling standard shipping methods.

This logistical flexibility is particularly beneficial for field operations requiring frequent redeployment or for teams with limited transportation capacity.

By eliminating the need for specialised shipping and storage, inflatable ASVs offer a streamlined solution for geographically dispersed missions.

Environmentally, inflatable ASVs

demonstrate a lower ecological impact compared to traditional alternatives. Their lightweight construction and shallow draft minimise disruption to aquatic habitats, making them suitable for sensitive ecological surveys or water quality assessments.

Ease of handling reduces operational complexity, especially in scenarios requiring frequent launches and recoveries.

CALYPSO

DotOcean's Calypso was one of the very first inflatable autonomous survey platforms to reach the commercial market.

With a board length of 1800mm and a 210mm draft, it can carry payloads of up to 150g.

It is controlled by a R/C controller and/or a tablet with Internet connection to allow autonomous operation.

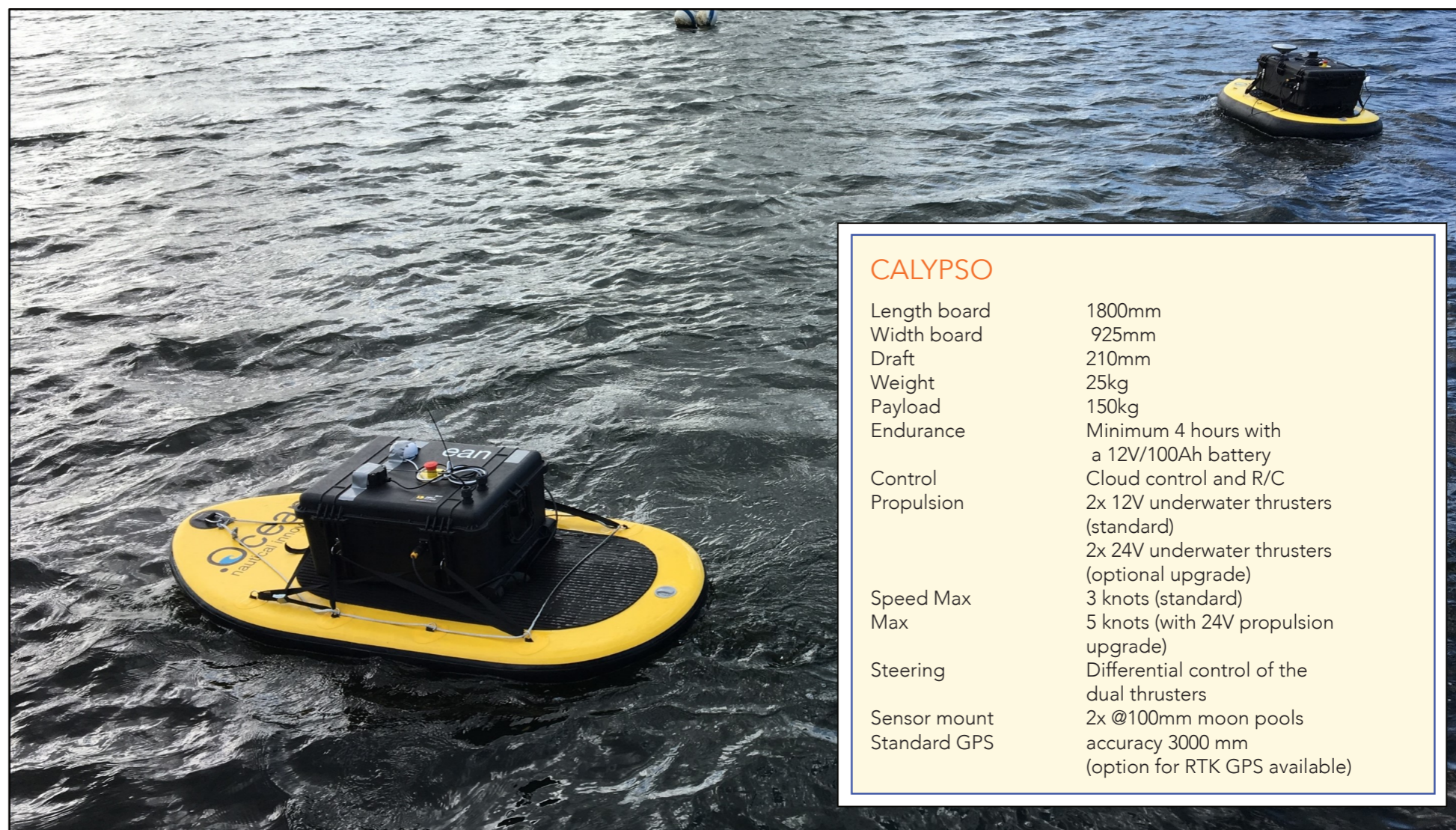
The Calypso uses its Cloud Link subscription to allow autonomous operation control, data visualisation and data storage.

The Calypso can be equipped with a Single Beam Echo Sounder (SBES), Multi Beam Echo Sounder (MBES), Sub-Bottom Profiler (SBP) or various other types of sensors like a camera, lights, gas sensors, temperature sensors,

ADCP or water sampler.

It is powered by a pair of 24V battery modules in individual waterproof cases

In its standard configuration, the Calypso is delivered with one black case that contains all electronics and has place for a 12V battery. However, this battery is not included in this standard configuration in order to allow for



CALYPSO	
Length board	1800mm
Width board	925mm
Draft	210mm
Weight	25kg
Payload	150kg
Endurance	Minimum 4 hours with a 12V/100Ah battery
Control	Cloud control and R/C
Propulsion	2x 12V underwater thrusters (standard) 2x 24V underwater thrusters (optional upgrade)
Speed Max	3 knots (standard)
Max	5 knots (with 24V propulsion upgrade)
Steering	Differential control of the dual thrusters
Sensor mount	2x @100mm moon pools
Standard GPS	accuracy 3000 mm (option for RTK GPS available)

UNCREWED SURFACE VEHICLES - INFLATABLES



easier and faster international shipping by air freight.

The user can choose to operate the Calypso with both 24V batteries

modules at once (double energy autonomy) or with only one 24V battery module onboard (allowing to charge the other battery module at the same time).

SURFBEE

Inflatable ASV's allow the operated to focus on the data and not the deployment. So says the Australian company Surfbee. It offers three main models of differing capacities.

The first is the **Flow Seeker** which Surfbee considers the daily driver and workhorse of its range. It is designed for a wide variety of gauging sections and sensor deployments.

Flowseeker is 1.65 m long and 0.7m wide. It contains two thrusters, a T 600 thruster on a keel and a T300 centre rear thruster which gives it a top speed of 4 m/s (3m/sec cruise speed). It weighs 13.5km excluding batteries and can carry a maximum payout of 10 kg yet it has a minimal draft of only 0.25 m.

Above the inflatable hull lies the

Flow Seeker
Dimensions: 1.65m x 0.75m x 0.1m
Weight: 13.5kg (without batteries)
Max speed: 4m/s (3m/s cruise)

pod which contains the control system and battery set. This module seamlessly integrates with the control system, providing a multiport plug for device connectivity. For some sensors, this connection hub can also provide power (12v 2 Ah)

It carries a Dual GNSS system with an onboard camera, an arrangement repeated across the range. Behind is an ADCP sensor which allows the vehicle to take autonomous transects and bathymetry readings.

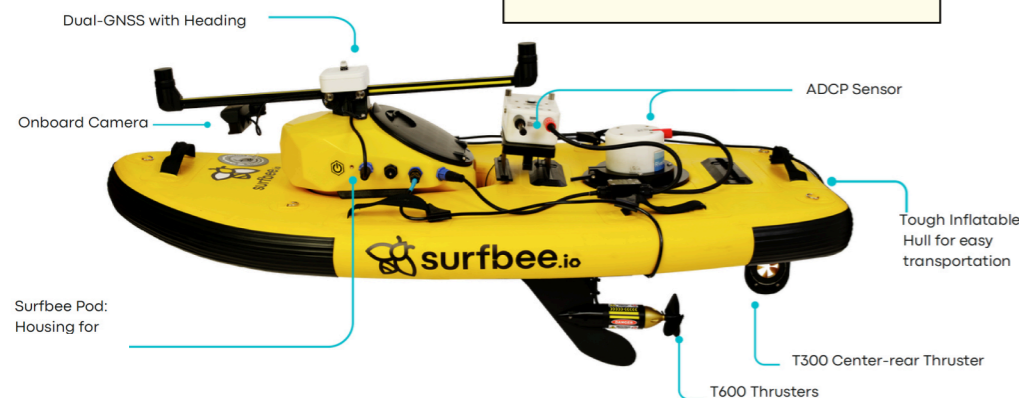
The the control body is designed to securely attach specific sensors or communication boards. Surfbee has designed these mounts to be highly adaptable, allowing for quick sensor swaps to meet various project needs in a single vessel. There are mounts for the Sontek M9, PCM, Sontek RS5 and RDI RiverPro.

The second vehicle is the **Flow Scout**, which Surfbee designed, to work in shallow waters. It is 1.35 m long and 0.7 m wide.

It is equipped with three underwater thrusters which gives it a top speed of 2 m/s. It weighs 11 kg without batteries and has a maximum payload of 8 kg.

It is designed to adapt to different sensors arrangements which the company says, ensures precise control through

FLOW SEEKER



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FLOW SCOUT



Flow Scout
Dimensions: 1.35m x 0.7m x 0.1m
Weight: 11kg (without batteries)
Max speed: 2 m/s
Minimum depth: 0.14m

autonomous movement, even in challenging conditions like windy and slow-moving channels.

The smallest of the three is the **Flow Finder**, which has a length of 1.2 m and is 0.7 m wide. It weighs 11 kg without batteries and has the maximum payload of 8 kg. This vessel is designed specifically for

Sontek RS5 deployment, taking advantage of the ADCP's new small form factor and depth range. Surfbee claims that it offers superior shallow water performance, and propelled by three underwater thrusters, it has a top speed of 2 m/s.

It features autonomous lateral movement for vessel control in difficult conditions such as windy, slow-moving irrigation channels.

FLOW FINDER



Flow Finder
Dimensions: 1.2m x 0.7m x 0.1m
Weight: 10kg (without batteries)
Max speed: 2 m/s
Minimum depth: 0.14m

AIRCAT

The AirCAT was developed by Subsea Tech in response to a challenge from a customer that required a complete USV and Multibeam Echo Sounder solution, able to operate at sea yet small enough to be easily transportable.

The designers came up with a novel inflatable catamaran design capable of operating in either teleoperated or fully autonomous modes. It can be packed into a bag and two cases that comply with the standards for checked luggage on airplanes.

The design is available in two versions.

The **AirCAT 270** is 2.74m in length and 1.54m in width and weighs only 42 kg yet can carry up to 180kg.

Subsea Tech also offers an **AirCAT 400** version. It has a length of 4m and a width of 1.98m. Both stand 1.25 m high excluding antenna. The nominal draft is 10 cm with the motorised or 30 cm with the motor engaged.

The AirCat is manufactured from ultra-durable PVC structure with double inflatable tubes which ensure optimal buoyancy, even in the event of a puncture in one of the tubes.

The design offers good stability on both inland and coastal waters up to Beaufort 3 and can operate in 5kt currents.

The AirCAT is powered by a

single electric 24v DC 1100W outboard motor powered by a modular 100Ah LiFePO4 battery compartment providing an average endurance of 4hours. This can be doubled or even trebled (12 hours) with additional batteries, thanks to its high payload capacity. This all gives the vehicle a speed of 6 kt.

Communication is based on a 5GHz high speed Wi-Fi link with a range of 3 km backed up by a 4 GHz radio link. The navigation system is also assisted by HD colour camera mounted on a 360° turret and navigation lights.

Optional equipment includes an AIS system and an obstacle avoidance function. Its autonomous navigation software supports point-to-point routing,

waypoint following, station-keeping, and return-to-base functionality.

SENSORS

It carries a number of sensor options. These include.
 Single-beam Bathymetry Airmar Smart SS510 sonar, 235kHz, range 0.5-100m, resolution 3cm
 Multi-beam Bathymetry Multibeam Norbit WMBS + INS + GPS RTK sonar
 Side-scan Sonar Starfish 450kHz/990kHz
 Imaging Sonar Teledyne BlueView M Series or BluePrint Oculus | 3D Lidar Norbit iLiDAR or VLP-16 "PUCK"
 Current Meter Sontek, Flowquest, or Teledyne RDI ADCP



AirCAT

VORTEX

WATER / GLYCOL POWERED 4 AND 6 INCH ROV DREDGE



Vortex has just released their water / glycol powered 4 and 6 inch dredge build to run on the Schilling GEMINI WROV platform and any other water / glycol hydraulic system.

Using the same power motor and pump to maximise efficiency and suction performance this tool adds further capabilities to the GEMINI with day-to-day tooling such as dredging that give the ROV more work scope flexibility.

Suction capabilities 4 inch - 70 kpa using 162lpm (43 GPM) @ 206bar (3000psi)
 Suction capabilities 6 inch - 40 kpa using 162lpm (43 GPM) @ 206bar (3000psi)

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