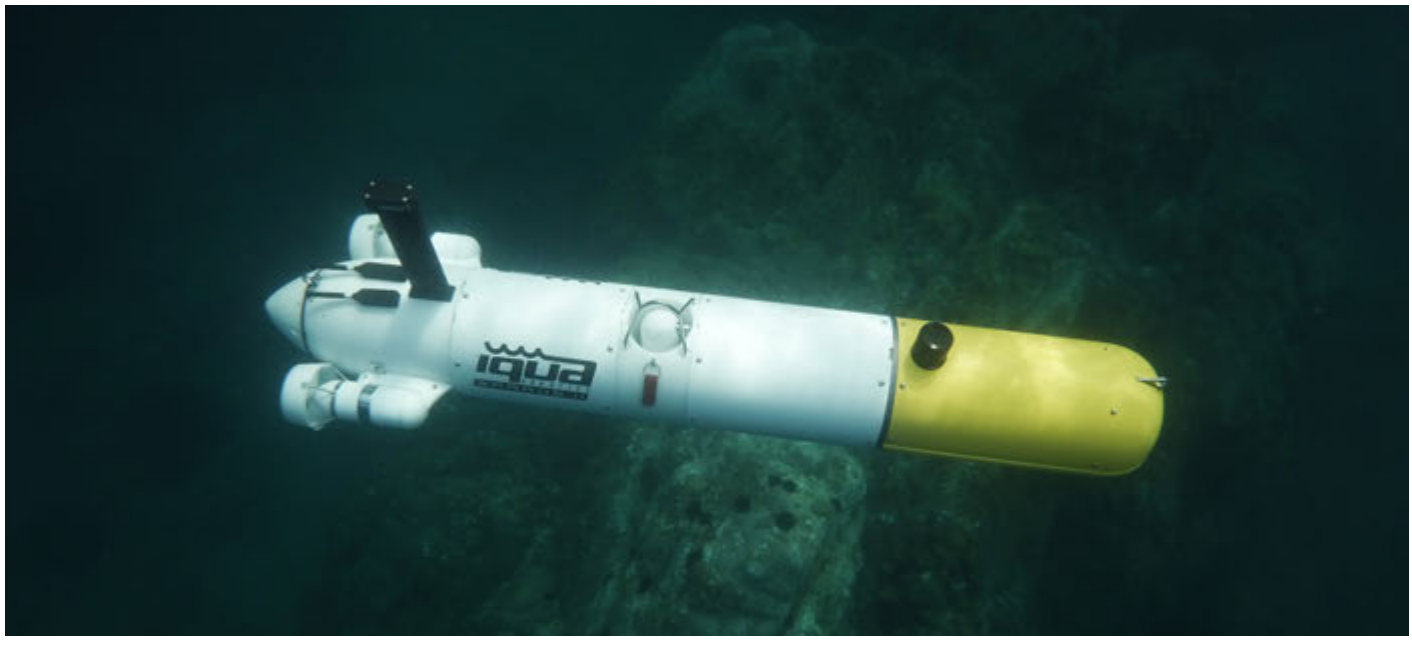
SPARUS II

Lightweight hovering AUV for smart mapping and inspection

Seabed mapping and inspection for a large number of applications from the scientific, industrial and defence sectors.



BASIC SPECIFICATIONS

Depth	Endurance	Velocity	Weight	Length	Width	Height	Hull diameter	Payload
200m	8–10h	0–3 knots	52Kg	1.6m	0.46m	0.49m	0.23m	8 liters

Hovering small-class AUV for a maximum depth of 200 meters. Conceived for surveying with the latest sensor technology, and inspecting at close distance for mapping the seabed with the best accuracy. Simple operation from a variety of vessels by a team of 2 persons.

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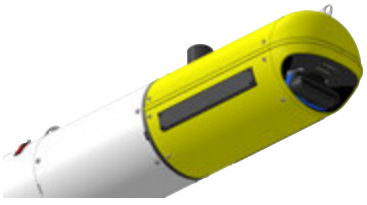
Configured to fit your applications

Using the basic platform, the vehicle can be configured with the most appropriate equipment for navigation, communication, safety, and perception. The company has extensive experience integrating oceanographic equipment from reputable suppliers. Specific equipment can also be integrated to maintain compatibility with existing systems. The frontal payload area is a wetted volume that allows for the easy integration of transducers, optical sensors, and water parameter measurement sensors to adapt the vehicle to each customer's application.



Lightweight but generous in capacity

SPARUS II can be easily operated by 2 persons, deployed manually with the help of its own trolley or using a small crane yet it features a generous payload area with enough space to house high-end equipment, state-of-the-art mapping sensors (multibeam echo sounders, side scan sonars, forward-looking sonars, cameras) and scientific instruments.

Hovering capability in a torpedo-shaped form factor

While featuring an hydrodynamic hull design that enables efficient survey transit, SPARUS II propulsion system ensures stability at slow speeds and offers enhanced maneuverability, being able to partially hover in place and perform precise turns.

Navigation accuracy adapted to your needs

SPARUS II can be equipped with a different suite of navigation sensors according to the application requirements, from MEMS-based navigation to high-grade FOG INS systems.

Competent operational performance

SPARUS II provides a level of endurance, autonomy and adaptability that make it well-suited for a wide range of applications. It is a versatile vehicle that can operate reliably underwater, thanks to its streamlined control and safety mechanisms.

Connectivity options for every scenario

SPARUS II offers a range of connectivity options to suit various operational needs. An acoustic modem ensures periodic data exchange while the vehicle operates autonomously underwater. Additionally, it includes an umbilical cable for indoor testing and high-speed data transfers, a surface WiFi buoy for real-time sensor data monitoring in shallow waters, and an RF controller for reliable long-range communication and robust control during deployment and recovery.

Advanced planning and monitoring software

Using the IQUAview interface and its plugins, missions for SPARUS II can be easily planned and monitored. IQUAview offers a high degree of flexibility in terms of mission customization and adaptability and handles the interplay with the vehicle before, during and after the execution of a mission.

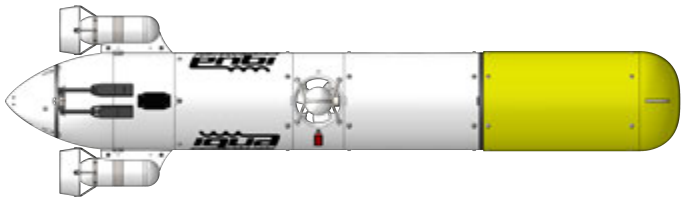
Quick mapping software to speed up the evaluation of collected data between missions

Sonar and image data collected with SPARUS II can be rapidly processed into informative products using SoundTiles or OpticTiles. This enables swift review of mission data, reducing the downtime between successive missions and maximising the vehicle's operational efficiency.

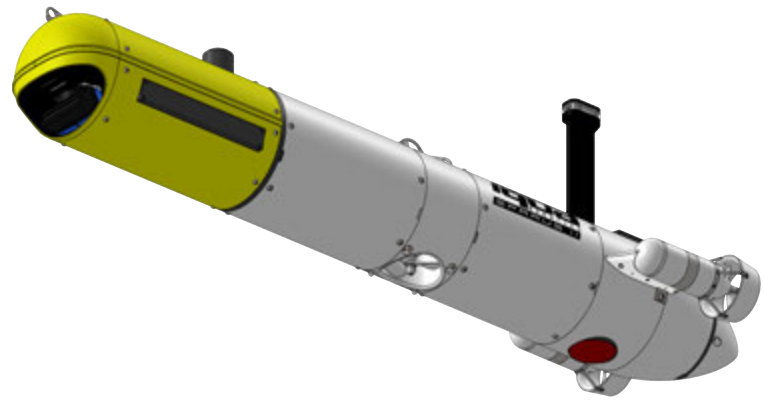
Open vehicle for new software and equipment integration

SPARUS II is an open platform that you can tailor to your applications. From integrating a new payload sensor to implementing a new advanced control behavior, the vehicle can be adapted on the customer end. By having direct access to the hardware and the ROS-based software architecture you can customise the system to meet specific mission requirements, ensuring that SPARUS II remains a versatile and future-proof solution.

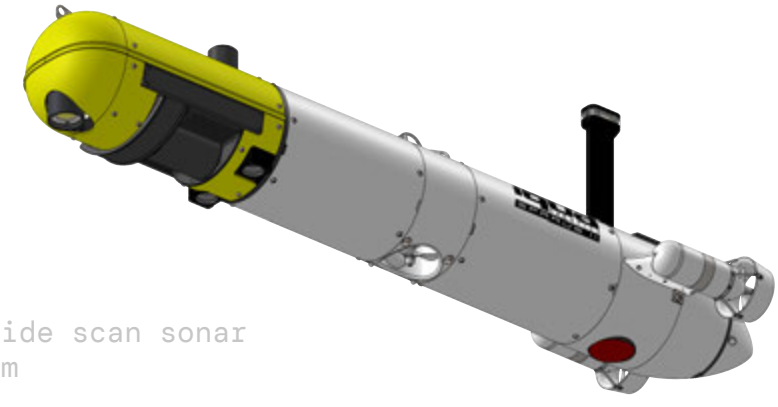
Size	0.49 x 0.46 x 1.6–1.7 m (Height x Width x Length), hull diameter: 230 mm.
Weight in air	50–60 Kg.
Depth rating	200 meters (pressure chamber certified).
Energy	1.9 kWh Lithium-Ion rechargeable battery (UN38.3 certified). Recharge time 6 hours.
Propulsion system	2x horizontal and 1x vertical thrusters (direct drive brushless DC motors with magnetic coupling).
Degrees of Freedom	Surge, heave and yaw. Partial hovering AUV, able to follow trajectories at low speed, keep position and move vertically.
Surge velocity	0–3 knots.
Endurance	8–12 hours, at 2–3 knots with standard payload.
Maximum range	40 km, at 2–3 knots with standard payload.
Structure	Modular aluminum and acetal hull. Main dry section (white) and payload wet section (yellow).
Payload	8 liters – 7 Kg in air of wet payload area for integration of sonar (side scan sonar, multibeam echosounder, forward looking sonar), optical camera system, CTD or water measurement sensors. Additional electronic board area in main dry section.
Payload interface	Gigabit Ethernet, RS-232 and DC-DC regulated voltages through underwater connectors.
Launch and recovery	Using trolley on small vessels or using a crane. Central hook for crane, front hook for towing and back hook for trolley operation.
Computer system	Embedded computer with Intel® CoreTM i7 Processor, 1TB SSD and Dual-LAN Gigabit Ethernet.
Communications	15–35 kHz acoustic modem, 869/900 MHz radio, 2.4 GHz WiFi and Gigabit Ethernet umbilical cable.
Navigation	Based on DVL, IMU or INS, pressure sensor, GNSS and USBL.
Antenna mast	Wifi, radio, GNSS, location flashing light and power status lights.
Acoustic beacon	Independent acoustic pinger with external directional receiver.
Software	ROS-based software architecture for AUV control (navigation, guidance, control and security) running on Ubuntu Linux.
Safety	Leak sensors, software automated recovery actions, manual recovery actions through acoustic comms and hardware enabled recovery under software/computer fault.
Control station	Laptop computer for mission definition and monitoring using IQUAview Graphical User Interface (GUI) running on Ubuntu Linux. Accessories for control station integration in vessel: WiFi access point, modem/USBL, GNSS and teleoperation gamepad.
Radio controller	869/900 MHz license-free digital radio controller for AUV teleoperation at surface, telemetry reception and execution of basic vehicle commands. Independent portable weatherproof equipment powered by internal lithium-ion battery.
Accessories	(1) battery charger, (2) 50m Gigabit Ethernet umbilical cable, (3) WiFi surface buoy with 15m cable, (4) trolley and (5) transportation box.



ONE AUV, MULTIPLE PAYLOAD CONFIGURATIONS



Side scan sonar and
forward looking sonar



Multibeam echosounder, side scan sonar
and optical vision system

IQUA Robotics produces and commercialises hovering Autonomous Underwater Vehicles (AUVs) and related technologies for comprehensive underwater exploration, precise mapping, and detailed inspection of the seabed.

The company develops AUVs with a variety of sensor payloads according to the customer needs and provides technical support to ensure successful implementation and operation of the technology throughout its lifespan. End-users make profit from a complete solution that goes from the operation of the vehicle till the data post-processing.

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