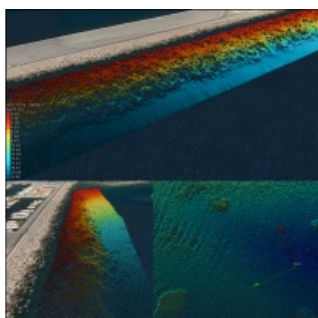
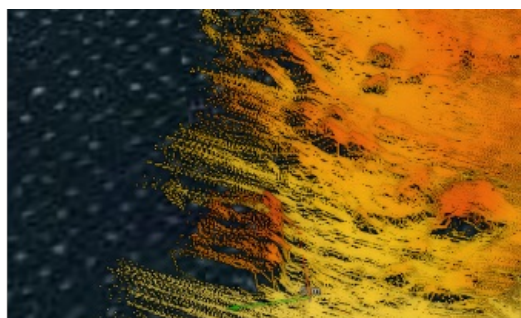


# THE SMALLEST AND MOST COST-EFFECTIVE DRONE WITH A MULTIBEAM SOUNDER

## The Ultimate USVs: Set to Sail



GPASEABOTS, a GPAINNOVA Group company located in Barcelona (Spain) and specializing in marine robotics and solutions for maritime and inland water operations, has recently developed a USV based on the WASSP S3r, one of the world's most cost-effective professional survey and mapping multibeam sounders available. Its unique characteristics and technology provide the perfect solution for applications such as hydrography, search and rescue (SAR) and mooring inspection.

To design and create this multipurpose platform, the SB 100 PRO model, GPASEABOTS combined WASSP's extensive technical knowledge with its own naval engineering and marine robotics know-how. As a result of this, the company was able to launch the smallest and most cost-effective USV with a multibeam echo sounder on the market. This means that several sectors will be able to benefit from a device that multiplies the functions offered by any other aquatic surface drone.

### Easy to Transport and Deploy

One of the main advantages of the new SB 100 PRO equipped with a WASSP S3r (an IHO S-44 standard Multibeam) in comparison to other USVs is its ease of deployment. Owing to its intuitive use and its fast and convenient transportation (103 cm x 75 cm x 56 cm and weighing 21 kg without accessories), it can replace traditional boats in calm waters, where precision and accuracy in the results prevail over covering large areas of water. The GPASEABOTS' USV, which is designed and manufactured under the "Ready to nav" concept, can be used in urgently needed bathymetries or similar interventions in commercial harbours, marinas, rivers and lakes.



Identification of blocks in maritime works.

For these missions, only a drone and a ground station are required. In addition, all the tasks can be carried out by a single operator, which saves resources and dramatically cuts operating costs without reducing effectiveness.

Once in place, the only procedure needed is to switch on the devices, the USV, the ground station and the controller. This is followed by a quick connection to our own RTK base or a NTRIP server to obtain the RTK corrections for the GPS. After quickly planning the mission, the drone is floated in the water in order to cover the maximum amount of area in the shortest time possible. As a result, it gets reliable data from the sea bottom instantly. Fortunately, GPASEABOTS' USVs have more than enough autonomy for everyday usage and to fulfil their tasks satisfactorily, without having to recharge.



This is why SB 100 PRO has proved that it is perfectly possible to implement field work in the morning, to obtain results at midday and to make consistent decisions in the afternoon.



Breakwater construction monitoring.

## Reducing Human Risk and Human Error

Drawing on GPASEABOTS' unmanned systems experience, its drones are especially designed to access confined, narrow and high-risk areas. Thus, these devices deliver enhanced performance to any operations and drastically lower risk to human life, which assures the safety of workers. The lack of training, inadequate breaks, working speed or unsuitable safety equipment can increase those risks.

These devices reach areas that cannot be covered by traditional ships. In addition, since the USV automates all sorts of missions, they significantly reduce the human factor error.



Mooring identifications for vessels inside port.

## Ready to Host all Types of Payloads

GPASEABOTS' experience shows that the combination of naval engineering, marine electronics and cutting-edge instrumentation can bring optimal solutions in very diverse fields.

The most common of these accessories are side scan sonars, single beam echo sounders, WASSP S3 (or S3r) multibeam echo sounders, Sound Velocity Sensors (SVSs), Sound Velocity Profilers (SVPs), created by Valeport; Acoustic Doppler Current Profilers (ADCPs), several types of cameras (thermal, underwater and for mooring inspection and control); multiparameter sounders to measure water parameters (including temperature, pressure, conductivity, salinity and turbidity); sub-bottom profilers, water samplers and winches for lowering and retrieving instrumentation into a water column. Inertial Measurement Units (IMUs) are manufactured by SBG Systems which provides motion and navigation solutions in highly compact and robust sensors available at different levels of performance: from miniature Ellipse sensors to mid-range Ekinox and high accuracy Apogee models.

SB 100 PRO is a USV that can integrate almost any type of marine instrumentation, depending on the goals pursued.



Inspection of a breakwater front.

## Best-in-class Equipment for Hydrography

A SB 100 PRO model equipped with WASSP S3r is suitable for almost all types of tasks in hydrography, the science that measures and describes the physical features of bodies of water, especially continental water resources. This drone is ready to create nautical and bathymetric charts and seabed characterizations to guarantee the sustainable management of fisheries. It will also help us to learn more about marine habitats, including ocean deserts or dead zones.

GPASEABOTS' USV can also perform high quality water analysis. With regard to this topic, it is worth highlighting that increasingly demanding environmental standards and regulations - for instance, the Spanish ROM 5.1-13, a Recommendation on Coastal Water Quality in Port Areas - are forcing a growing number of companies and institutions to take systematic samples and analyse the marine waters and sediments in harbours.



Multibeam bathymetry with WASSP S3 integrated in SB 100 PRO.

Aquatic drones are also extremely useful in dredging operations. Their use allows us to know the features of the seabed in advance. Additionally, USVs can continuously generate a map of the area, which helps in setting best procedure at any time.

Aquatic drones are also improving aquaculture, one of the fastest-growing sectors in the global economy and a key pillar in guaranteeing the planet's food resources. As stated in 2018 by the Food and Agriculture Organization of the United Nations (FAO), future demand for fish will come mainly from aquaculture. In this regard, USV missions can optimize fish farm results, while improving animal welfare and meeting consumers' concerns about food.

## Suitable for a Wide Range of Applications

GPASEABOTS' aquatic drones are suitable for visual or ultrasonic inspections in harbours and some other structures commonly related to engineering. They can successfully carry out missions in fields like security assessment, chain and mooring inspections, seabed clean-up activities and analysis of the impact of storms and natural disasters.

There is a growing demand for environmental studies, also known as environmental impact assessments (EIA), in order to prevent damage to the environment. USVs can support environmental studies with visual marine life inspection, marine habitat mapping and water sampling for studies on the physicochemical parameters.

Regarding tasks related to SAR, SB 100 PRO can search for people and artifacts in aquatic environments, guaranteeing the safety of those involved in the rescue mission at all times. Normally, these actions are carried out by emergency services teams and security forces (SF). Thanks to the multibeam sonar integration, the aquatic drones can cover a very large area in a short time for quick mapping, allowing safe emergency dive planning.



Point cloud obtained after postprocessing data.

Aquatic drones can also be used in underwater archaeology in seas, oceans, rivers and lakes, for the location, identification and recovery of submerged structures, sunken wrecks or anthropogenic artifacts. Sometimes, these discoveries may have a positive effect on the tourism sector and on outdoor sports activities.

With regard to water cleaning tasks in harbours, a well-equipped USV cuts operational and maintenance costs and eliminates human risk and eventual risks from human factors.

## Conclusions

To conclude, the results obtained by GPASEABOTS in pilot tests and the feedback given by clients demonstrate that the company's expertise, its USVs and the use of WASSP instrumentation are a winning combination. The union of SB 100 PRO and a WASSP S3 sounder creates a very complete and cost-effective product, whose main benefits are operating cost reductions, faster missions and greater accuracy in the final results.

### About GPASEABOTS

Founded in Barcelona in May 2019, GPASEABOTS' activities focus on facilitating the analysis, preservation and restoration of the marine environment through the development of highly sophisticated solutions. This goal is being achieved by adapting the latest technologies in various fields to a sector that has always been affected by operational barriers. Nowadays, its product range includes microplastic-capturing buoys and USVs.

GPASEABOTS belongs to the GPAINNOVA Group, one of the fastest growing organizations in Europe according to the Financial Times.

### More information

<https://www.gpaseabots.com>

<https://www.gpainnova.com>



WASSP S3 integrated on SB 100 PRO.

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<https://www.hydro-international.com/case-study/the-ultimate-usvs-set-to-sail>

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