UNMANNED SURFACE VEHICLES
FOR BATHYMETRIC DATA ACQUISITION
A LEADING PROVIDER OF INNOVATIVE UNMANNED SOLUTIONS
OUR SYSTEMS OPERATES UNMANNED IN THE AIR....

Maritime Robotics is a leading provider of innovative Unmanned Vehicle Systems (UVS) for maritime operations in harsh environments.

Our Unmanned technologies and products operate and collect data in the air, on the surface, and on the sea. Our products are within 3 main segments, Unmanned Aircraft Systems (UAS), Moored Balloon Systems (MBS) and Unmanned Surface Vehicles (USV).

With technology and products developed in cooperation with and on demand from civilian, governmental and military users, Maritime Robotics focuses on delivering high-quality system solutions and products that are cost-efficient, reduces HSE risk exposure and are highly deployable, in any conditions.

We believe that the future of maritime operations will enable more unmanned data acquisition, driving industry standards and broadening operational possibilities for these products.

Maritime Robotics’ headquarters are located in Norway’s technology capital Trondheim, staffed by a highly competent team of engineers and personnel. For our global clients and partners, our staff will at any time provide you with support and services, as well as assist you in finding the right solution for your maritime operations.

...AND ON THE SURFACE
USV FAMILY AT A GLANCE

Bathymetry is usually performed by sailing a boat with a multibeam sonar in a rather repetitive lawn-mover pattern. The data acquisition should ideally be going on 24/7, but when using manned survey boats this possibility may be limited due to crew HSE regulations. We believe that this is an ideal job for a robotic boat, that sails these repetitive patterns 24/7 with the result of saving both costs and reducing HSE risk for survey personnel. The cost-saving and HSE reducing motivations are even bigger in a shallow-water bathymetry surveying.

Maritime Robotics USV systems can be delivered on almost any hull that matches the user’s mission profile, and by listening to the market we have chosen 2 standardized sizes for a integrated USV bathymetry system, in addition to the possibility of converting almost any boat to an Unmanned Surface Vehicle with our USV Conversion System.

Size matters when it comes to sea-state capabilities and endurance, and for open-water and coastal missions the larger Mariner USV will be the obvious choice. Capable of open water operations (coastal and offshore) our Mariner USV offers a survey endurance of 2 days’ continuous operation and a speed range of up to more than 30 knots for rapid transit legs. Slightly below 6 m overall length, it can still fit into a standard cargo-freight container, which makes the Mariner USV a relatively deployable system.

A smaller vehicle can be more flexible and convenient when it comes to sheltered and calm waters. A small USV has obvious advantages, both during shipping and handling at the site of operation, making our new MiniUSV (of only 150cm length and 70kg weight) an obvious candidate for shorter duration surveys in lakes, canals, rivers, ponds and harbours. Compared to a bigger USV, the MiniUSV is also a lower price entry point for the users who are keen on starting with USV based surveying.

SHELTERED WATERS
Our small MiniUSV is a high deployable integrated turnkey system for bathymetry in sheltered waters such as small lakes, rivers, ponds and harbours.

OPEN WATERS
For open waters a larger USV would normally be preferred. The Mariner USV offers both the sea-state and the endurance you would need for 24/7 operations in open water areas.
MINIUSV

Turnkey USV system
The MiniUSV is our newest member of our USV family. With a logistic footprint of only 1,65x0,95m and a weight of 60kg, it is an easy deployable asset that can be transported in a van or even with normal airliners to where the job needs to be done. Electric propulsion and a tightly integrated bathymetric survey system, makes this system a cost-efficient and “ready from the box” option for bathymetric surveys in sheltered waters such as smaller lakes, canals, rivers, ponds and harbour areas.

Vehicle Control Station (VCS)
Maritime Robotics’ custom Vehicle Control Station (VCS) allows the surveyor to plan the missions in a maritime chart based graphical user interface and also to monitor the mission and the data acquisition quality while the USV is sailing. The VCS can be delivered on a ruggedized handheld control terminal.
Our Vehicle Control Station is created in cooperation with industry designers. An important feature is the easy-setup and ergonomy.
Mariner USV

The Mariner USV is a multipurpose vehicle with a length of 5.85m, designed for coastal and open water operations. Made of high density polyethylene material and with two independent pontoon chambers filled with expanded polystyrene, the Mariner USV is virtually unsinkable. A Volvo PentaD3 of 150hp and a Hamilton 241 waterjet gives both a speed range of up to more than 30 knots as well as being a well-proven propulsion line. A payload room of 1 m³ is located in the middle of the boat, and from there a 30 cm diameter moonpool provides access to the water column for a large variety of sensors for maritime data acquisition.

Vehicle Control Station (VCS)

The working environment is of crucial importance when performing a long endurance unmanned survey mission. Maritime Robotics custom Vehicle Control Station (VCS) allows the surveyor to plan the missions in a maritime chart based graphical user interface and also to monitor the mission and the data acquisition quality while the USV is sailing. Monitoring and controlling the USV is done over a customizable set of communication systems such as VHF/UHF, GPRS, SatCom and C-band links. The VCS collision avoidance aids consists of a customizable set of AIS object visualization, radar view and EO/IR camera view.

New to the market is also the ability to monitor the multibeam seabed footprint in real-time. This functionality will secure that no time and money is lost due to invalid or incomplete data sets.
Some users want the option of using their survey boat in an unmanned mode, while still having the option of manned use. Other users see a potential in using Unmanned Surface Vessels, but are not yet ready to take the cost of investing in a custom USV platform. For those users the Maritime Robotics USV Conversion System offers a unique opportunity to take advantage of the possibilities for unmanned surface operations.

The USV Conversion System includes the same Vehicle Control Station, Communication and On-Board-Systems as the more integrated Mariner USV system, but can also be highly customized for your special need and requirements.

For bathymetric survey we often see that many users have invested in customized smaller manned survey boats. These users can now transform their boat into unmanned operations and thus achieving the HSE and cost-saving features of unmanned operation.

The predecessor of the current Mariner USV was originally built around a converted PolarCirkel 560 with outboard engine.

Maritime Robotics has also converted conventional leisure crafts, such as this Viknes 830.

We have also converted military patrol-boats to unmanned operations. The conversion is normally done within 1-2 days.
For more than 5 years ago Maritime Robotics and the Norwegian University of Technology and Science (NTNU) demoed what we still claim was “the world’s first full-scale demo of unmanned formation controlled boats”. At that time, we clearly saw a potential, but did not yet have a clear view of all the possibilities this technology could open up for.

Since then, our internationally patented Formation Control System has been developed into a ready-to-go product for users who want to spread out sensor carrying boats over a larger water area, giving the possibility of controlling your fleet of multiple vessels like it was one single unit.

For multibeam bathymetry we have also improved the Formation Control System to use the information about the seabed footprint of the multibeam as a direct guidance input for the formation. The surveyor can then decide the required multibeam overlap that he wants, and then the Formation Control System takes care of the rest.

Our innovative Formation Control System has been accepted with a US patent no.9151858 B2, EP patent no. 2198355 B1 and NO patent no. 327433.