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– Douglas Webb, Founder of Webb Research



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vLBV ROV

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 - SeaSafe Battery Module Charger
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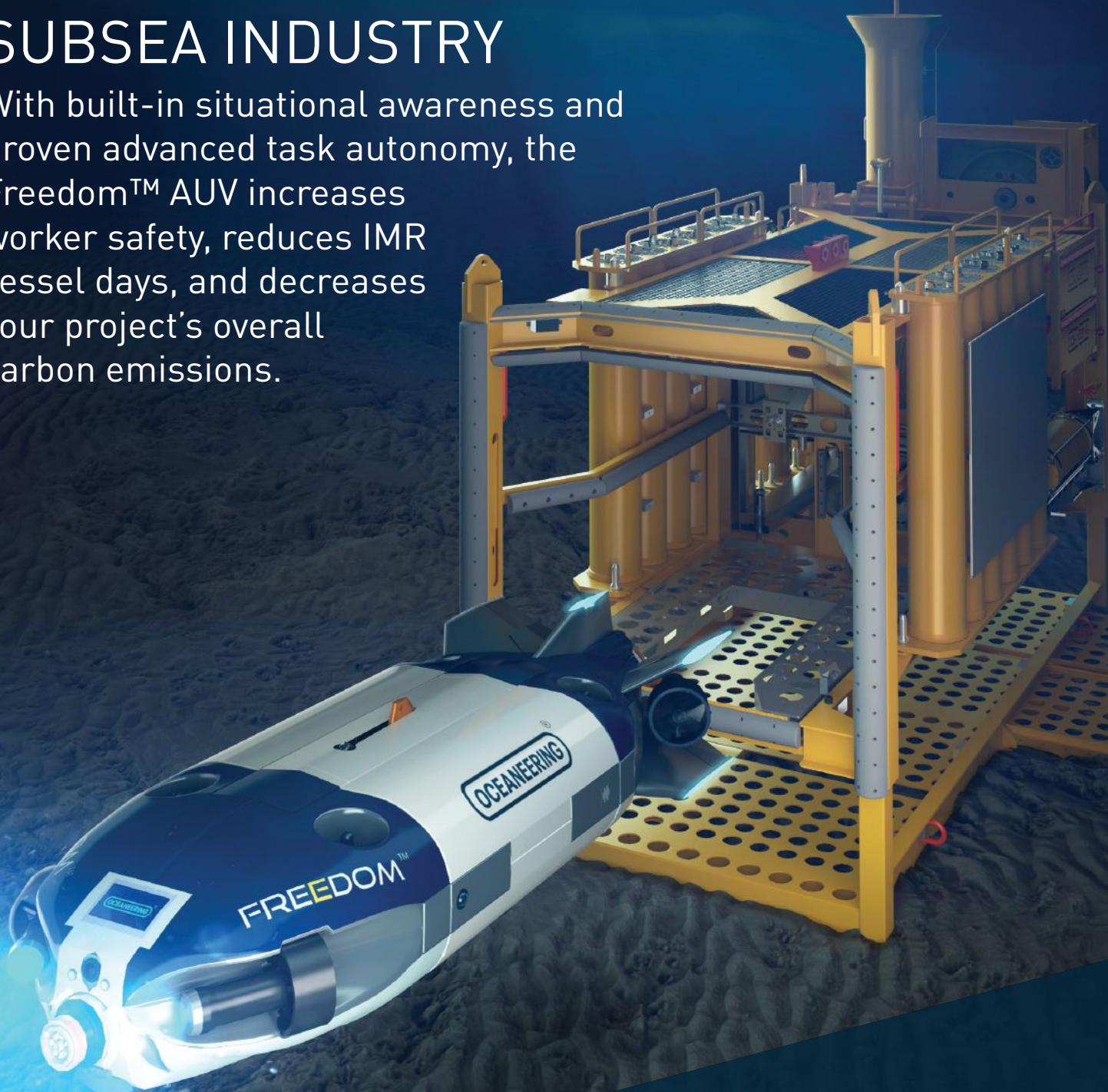
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UNCREWED VEHICLES SET PATH TOWARDS AUTONOMOUS OPERATIONS

BY ED FREEMAN

Managing Editor, ON&T

One topic is sure to shape the ocean technology seascape over the next five years—autonomous operations. This planned integration of A.I.-informed marine systems presents a dawning paradigm shift for the ocean industries, which will likely see decades of offshore convention—long-established best practices—streamlined by emerging data-fueled technologies, all in the name of more efficient, safer, and carbon conscious ways of working.

INFLECTION POINT

The recent uptick in investment, development, trial, and adoption of solutions engineered to incorporate Artificial Intelligence (A.I.) and the adaptive capacity of Machine Learning (ML) into standard offshore operating procedures is often characterized by the growing trial and adoption of uncrewed marine vehicles, namely Uncrewed Surface Vehicles (USVs), Autonomous Underwater Vehicles (AUVs), Remotely Operated Vehicles (ROVs), and other programmable platforms.

The underlying premise that unites this ecosystem of smart systems is their collective capacity to carry out relatively routine tasks in challenging marine environments, which, in turn, allows operators to scale back reliance on traditional in-field resources, such as expensive topside vessels, personnel, and other *in-situ* support.

A MILESTONE YEAR

Industry headlines in 2022 have been dominated by back-to-back high-profile company announcements—product launches, enhancements to existing models and components, and significant service contract awards—bolstered by unprecedented levels of industry collaboration and public policy, all geared towards market scalability and augmenting the navigation, range, payload capacity and function of uncrewed vehicles.

For example, April's demonstration of ORCA, a long-endurance X-Large Unmanned Underwater Vehicle (XLUUV) designed and built by a Boeing/HII consortium, hails a new era for automated subsea operations, including mine laying, mine countermeasures, intelligence gathering, antisubmarine operations, and electronic warfare. The US Navy is expected to take delivery of five of these multipurpose XLUUVs by the end of the year but a recent U.S. Congress report states that the U.S. Navy demands to commission 50 such XLUUVs over the coming decades.

Above the surface, the *Mayflower Autonomous Ship* (MAS400) arrived in Plymouth MA on June 30 after a 3,500-mile uncrewed Atlantic crossing. MAS400 left Plymouth (UK) in late April equipped with six A.I.-powered cameras, more than 30 sensors, and 15 Edge devices all programmed to input actionable recommendations for its "A.I. Captain"

to interpret and analyze. Backed by IBM and Promare, the MAS400 project represents a uniquely collaborative undertaking between industry and research partners—49 in total—all invested in exploring how autonomous operations will reimagine the maritime domain.

Despite these and other landmark achievements, the in-field reality is that the current application of A.I. and ML has limitations. A.I. is not able—yet—to discern things without extensive human training and supervision. Indeed, MAS400's voyage required two unscheduled pitstops in the Azores and Nova Scotia, course deviations that hinged on human intervention.

REMOTE OPERATIONS

So, for now, the successful integration of autonomous operations will rely not only on the capacity of uncrewed vehicles but an emerging breed of highly data-literate, supervisory roles. Where once personnel were transported offshore to execute tasks, today, thanks to failsafe communication and precise control systems, these very same specialists can "call the shots" from a remote command, leading to optimized operational efficiencies and diminishing CO₂ emissions.

The ability to control uncrewed assets and subsea infrastructure from established Remote Operations Centers (ROCs) therefore, represents one of the most practical gateways to autonomous operations. Whether for ocean surveillance or complex underwater intervention, operators can supervise vehicles carrying out routine tasks and intervene—by taking full control—as necessary. This constant data feedback between controller and vehicle is Machine Learning in real time.

The effectiveness of shore-based ROCs, alongside manufacturers' commitment to developing increasingly sophisticated uncrewed vehicles, will set out path to automating the way we work at sea. In time, the successful implementation of true A.I. will empower systems to determine when and where appropriate action is required.

UVBG 2022

Suffice to say, it is an exciting time to report on the ocean technology sector, and while the market for uncrewed marine vehicles has evolved considerably over the seven years since ON&T launched the Uncrewed Vehicle Buyers' Guide in 2015, the mission remains unchanged: to produce an intuitive guide to the broadening range of vehicles helping to accelerate ocean research, subsea exploration, and marine defense towards new frontiers.

Welcome to ON&T's UVBG 2022.



SMART SUBSEA SOLUTIONS

Delivering data in most adverse conditions: underwater acoustic modems with advanced communication technology and networking

Accurate USBL and LBL positioning of underwater assets

Modem emulator and other cost-saving developer tools

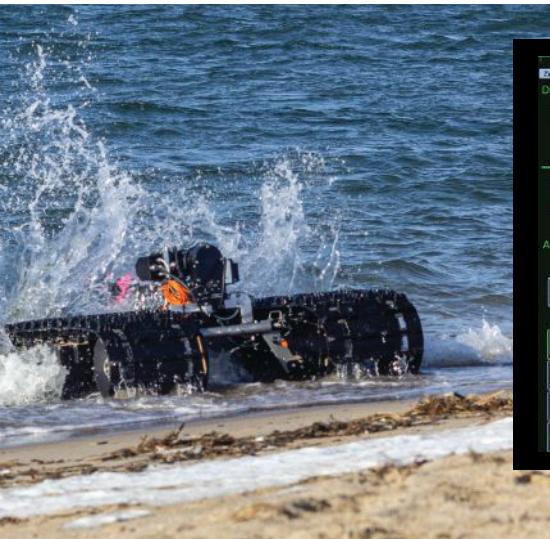
Autonomous surface vehicle for bathymetry, monitoring, search & rescue, and AUV support

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AVAILABLE
NOW

Accurate USBL positioning and data transfers,
just unfold and deploy:

the all-in-one device features a modem with USBL antenna, AHRS, GNSS and on-board PC with positioning software, all ready go in minutes.





» OPENSEA is used by Bayonet's range of surf zone amphibious crawlers for over-the-horizon command and control. (Photo credit: Bayonet Ocean Vehicles)



» OPENSEA was designed with a modular framework to facilitate the quick and easy integration of robotic systems. (Photo credit: Greensea)

COMMANDING ROBOTIC SYSTEMS AND UNMANNED VEHICLES

Marine robotics technology specialist Greensea Systems Inc. is a leading provider of the software suite that enables and advances underwater robotic systems and vehicles.

Greensea Systems began in 2006 when current CEO and President, Ben Kinnaman, founded the company with the aim to help deliver robust and precise integrated navigation and control systems for offshore vehicles, through a commercially available open architecture software platform.

The resultant software, OPENSEA, was designed and developed by Greensea's engineers, a highly specialized team with a background in robotics and electrical systems. OPENSEA offers an open architecture software platform with modular framework to facilitate the quick and easy integration of robotic systems, providing the end-user with an easy solution to deliver precision and accuracy to ROVs, AUVs, and other marine robotics/offshore vehicles.

BROAD APPLICATIONS

The OPENSEA platform provides a comprehensive and proven technology framework for a range of applications now and in the future:

Provides Capability: Autonomy, navigation, control, and communication – everything needed to make your hardware ready to deploy.

Drives Development: The modular nature of OPENSEA speeds development time and contains costs while relying on the robustness of thousands of OPENSEA deployments.

Supports Collaboration: Open architecture makes the OPENSEA platform infinitely collaborative. Expand the vehicle's current capabilities or prepare for future adaptations.

Fuels Innovation: Quickly stand-up commercial-grade robotic systems while focusing on higher-level technologies that will result in differentiation and advancement.

Leading OEMs across the world have built their innovative technologies on OPENSEA, trusting in a tough, adaptable, and well-proven foundation, thereby saving considerable cost, time, and risk. To date, the platform is being used as the basis for more than 2,500 systems across the subsea, surface, manned and unmanned sectors.

ABOVE AND BELOW THE WATERLINE

Examples of technologies built on the OPENSEA platform include Armach Robotics, an autonomous in-water robotic hull cleaning and surveying subscription service, and Bayonet Ocean Vehicles.

OPENSEA provides the precision navigation, autonomy, and long-range command and control to Armach's Hull Service Robot that is needed to support the in-water, pro-active cleaning. By choosing OPENSEA as its development platform, Armach was able to speed development of its novel solution by building with proven and tested tools.

Bayonet Ocean Vehicles manufactures the Bayonet range of surf zone amphibious crawling vehicles. Deployable from land or water independent of weather, the Bayonet crawlers have been designed to transit along the ocean floor as well as on land, making them the only robotic platform in the world capable of working the surf zone, between 109 yards (100 meters) of seawater and all the way up the beach.

Built on the OPENSEA platform, the crawlers offer precision navigation, payload integration, autonomy, and over-the-horizon command and control, and cover a wide range of possible payloads and applications, including environmental, oceanographic, hydrographic, benthic and industry specific sensors to accommodate numerous commercial and military applications.

For more information, visit: www.greensea.com.

OBSERVATION ROV

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OCEAN RENEWABLES



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AC-ROV 100

The AC-ROV is the most capable and portable underwater inspection system on the market. A complete system comes in one rugged waterproof hand carry case with an all up weight of just 18kg. It defines the "HAND CARRY" single operated class in underwater inspection systems. (Customizable)



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AC-ROV 3000

The AC-ROV 3000 is the first ever deep ocean micro ROV. To maximise its capability it comes fully packaged with a Tether Management System (TMS) allowing it to operate as a 3000m depth rated "Fly-Out" from many types and size of host submersible.



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ARGUS REMOTE SYSTEMS AS

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ARGUS MINI

Observation class ROV that can be fitted with an open/close or a 5 function manipulator. (Customizable)



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BLUEROBOTICS

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Sales | sales@bluerobotics.com



BLUEROV2

Ocean research, exploration, and adventure are all made easily accessible by our flagship product, the BlueROV2. It provides the capabilities of a high-end commercial miniROV at the price of the most basic commercial ROVs, making the BlueROV2 the world's most affordable inspection and research-class subsea vehicle.



BOXFISH

WWW.BOXFISH.NZ



BOXFISH LUNA

The only next-generation professional cinematography ROV integrating a full-frame camera capable of shooting up to 4K ProRes RAW video at 30p and 50MP stills. The actively stabilised vehicle can travel and orientate itself in any direction, ensuring super-smooth and creative shots. The surface console also enables precise management of camera settings.



DEEP OCEAN ENGINEERING, INC.

WWW.DEEPOCEAN.COM

Sales | sales@deeppocean.com



PHANTOM® L6

Phantom® L-SERIES

The Phantom® L-Series is an inspection-class underwater remotely operated vehicle, designed for use in numerous applications across a spectrum of industries. The Phantom® L6 is designed with four vectored horizontal and two vertical Tecnaidyne® thrusters, which provide significant control and propulsion in current.



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PHANTOM® T-SERIES

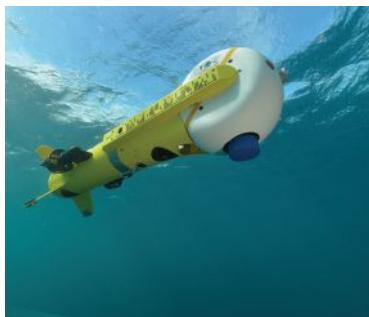
The Phantom® T-Series ROV provides powerful maneuverability, incorporates an open architecture, integrates with a wide variety of sensors and is hand-built on a rugged, resilient, non-corroding polypropylene chassis that can accommodate heavier payloads. In addition, the Phantom® T5 Defender package is engineered to include navigation software, an Inertial Navigation System (INS), Doppler Velocity Log (DVL), GPS, imaging sonar, a single-function manipulator, and our patented underwater breech for explosive ordnance disposal. (Customizable)



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ECA GROUP

WWW.ECAGROUP.COM | Anthony Penn | sales.robots@ecagroup.com



K-STER

The K-STER vehicle is a lightweight expendable mine disposal vehicle dedicated to underwater mine warfare missions. This MIDS solution allows to remotely neutralize a sea mine while keeping crews out of the minefield. The user-friendly command and control software offers auto piloting functions and allows to conduct the operation in a safe way from deployment to the final firing. It is fitted with a shape charge in a tiltable head to aim at the target to dispose of.



DEEP TREKKER INC.

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DTG3

DTG3 ROV is designed with the operator in mind, making inspections and surveys in the harshest environments easier than ever before. This package provides everything operators need to get started with inspections, with plenty of modular options to enhance the ROV's capabilities. (Customizable)



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PIVOT ROV

The PIVOT ROV strikes the perfect balance between size and power. Equipped with 6 strong thrusters to provide users with stability, power, speed and unmatched control (Customizable)



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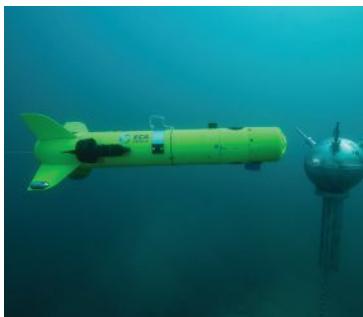
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VEHICLE STATION KEEPING

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SEASCAN MK2

The SEASCAN MK2 is a light weight self-propelled ROV dedicated to inspection missions. Its unique architecture ensures second to none performances in terms of hovering capability and stability in turbulent water. Easy to deploy from any kind of platform, the user friendly command and control software offers auto piloting functions to improve mission efficiency.



EPRONS ROV LTD.

WWW.EPRONS.LV/EN/

info@eprons.eu



ALPHAROV D150

EPRONS produces a series of modern digital surface powered underwater remotely operated vehicles (ROV models) designed for observation, inspection, exploration or search & rescue missions. Working depth till 150 meters. Tether length 150 meters (up to 300 m). Full HD 1080P 2MP Color camera. 4 Brushless thrusters : 2 Horizontal; 1 Vertical; 1 Lateral.



OBSERVATION ROV

EPRONS ROV LTD

WWW.EPRONS.LV/EN/ | info@eprons.eu



ALPHAROV D200

Working depth till 200 meters. Tether length 200 meters (up to 600 m). Full HD 1080P 2MP Color camera. 5 Brushless thrusters: 2 Horizontal; 2 Vertical; 1 Lateral.



ALPHAROV D300

Working depth till 300 meters. Tether length 300 meters (up to 1200 m). Front: Color Full HD and B/W cameras. Rear: additional color/BW camera Full HD 1080P 2MP. 7 Brushless thrusters: 4 Horizontal; 2 Vertical; 1 Lateral. Vectored thrusters configuration available for this model.



ALPHAROV D500

Working depth till 500 meters. Tether length 500 meters (up to 5000 m). Front: Color Full HD and B/W cameras. Rear: additional color/BW camera Full HD 1080P 2MP. 7 Brushless thrusters: 4 Horizontal; 2 Vertical; 1 Lateral. Vectored thrusters configuration available for this model.



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JW FISHERS MFG. INC

WWW.JWFISHERS.COM | Brian Fisher | info@jwfishers.com



SEAOTTER-2 ROV

For over 53 years, JW Fishers has specialized in the design and manufacture of underwater search equipment. Their product line includes underwater metal detectors, cable trackers, pipe trackers, video systems, lights, magnetometers, sonars, ROVs, and pingers. Fishers ROVs are in use by commercial diving companies, universities, police & military worldwide.



SEALION-2 ROV

For over 53 years, JW Fishers has specialized in the design and manufacture of underwater search equipment. Their product line includes underwater metal detectors, cable trackers, pipe trackers, video systems, lights, magnetometers, sonars, ROVs, and pingers. Fishers ROVs are in use by commercial diving companies, universities, police & military worldwide.





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AGEOTEC ROV SIRIO

Leveraging more than two decades experience in coastal and offshore surveying and construction characterising the AGEOTEC product line, the ROV Sirio presents itself as the first model of L3Harris' wide range of remotely operated vehicles. Sirio features a modular chassis manufactured in high impact resistant polypropylene, totally maintenance-free and non-corroding. (Customizable)



VC&L | A&T

MARISCOPE MEERESTECHNIK

WWW.MARISCOPE.DE

Niklas Becker | n.becker@mariscope.de



PEEWEE 100

The world's first hybrid of its type, combination between a ROV and a towed vehicle. Robust stainless steel TIG hand welded frame but easy to carry by hand, incorporates a Full HD camera and with a pair of high output LED spotlights, both installed on a tilting system. Lifetime warranty. (Customizable)



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MARINE IMAGING TECHNOLOGIES

WWW.MARINEIMAGINGTECH.COM

David Ullman | david@marineimagingtech.com



PIXEL

The original Cinema class ROV, Pixel boasts live stream imaging and control of forward facing 4k and HD video and 45mp stills along with 4k video downward facing. Conceived by a cinematographer, Pixel's original purpose was to be the ideal system for subsea documentaries. She has since expanded into research and exploration, adding photogrammetry to her list of skills. (Customizable)



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MARISCOPE MEERESTECHNIK

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Niklas Becker | n.becker@mariscope.de



MS2

Evolved, depth rated to 500 meters. 35 kg and 4 thrusters. Hydro dynamic shape in a stainless steel frame (AISI 316L) manually TIG-welded, equipped with high end components (Full HD Cam with laser pointers and others) and customizable accessories, offers maximum operating stability, high maneuverability and easy maintenance. Lifetime warranty. (Customizable)



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OUTLAND TECHNOLOGY

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ROV 500

1000 ft (300 meter) rated. With LED lights. The ROV-500 utilizes brushless DC flooded thrusters. Outland designed a control system around these thrusters to maximize the power, giving the ROV-500 a high thrust to weight ratio. Tilting Camera forward is 1080p High Resolution. Standard system ships with 330 ft (up to 1000ft cable max).



ROV 1000

Brushless DC, Magnetically Coupled Thrusters. Easy deployment and operation. All digital control of camera, lights, thrusters and grabber.



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PLIANT ENERGY SYSTEMS

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Pietro Filardo | filardo@pliantenergy.com



C-RAY ROV

Pliant Energy Systems anticipates the release of its C-Ray class vehicle for sale in 2022/3. The C-Ray ROV utilizes the company's unique, proprietary undulating drive instead of propellers. The fins undulating drive give the vehicle superior maneuverability and the ability to pass through debris-filled water or mud. C-Ray has the ability to move across solid surfaces and can make the transition from water to land and it can glide over solid ice using the same fins it uses for swimming and crawling. (Customizable)



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WWW.SRSFUSION.COM
Nick Devine | info@srsfusion.com



FUSION

The Next Generation UUV - FUSION is an expeditionary ROV with a bespoke suite of high-end sensors delivering a highly capable and intelligent system. A self-contained (no generator required) system augmented by clever automation and supervisory control through an unparalleled, intuitive user interface establishes a new benchmark in UUVs.



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SEAMOR MARINE LTD.

WWW.SEAMOR.COM
Robin Li | sales@seamor.com



STEELHEAD ROV

The STEELHEAD inspection-class ROV is a portable, lightweight and stable underwater system that is easily operated through intuitive flight controls. A small profile allows this vehicle to inspect confined spaces and be easily stowed. The compact STEELHEAD is easily deployed and recovered from small vessels and docks—no need for hoists or cranes. (Customizable)



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SEAROVER

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» US Navy - Rich Arrieta, Naval Information Warfare Center (NIWC), Unmanned Maritime Vehicles Lab.
(Photo credit: VideoRay)



ADVANCING ROV TECHNOLOGY WITH HUGE COMMERCIAL IMPLICATIONS

VideoRay is working with the U.S. Navy to develop innovative Perception and Autonomous technology for ROVs. This technology helps keep vessels and personnel safe and out of harm's way during explosive ordnance disposal (EOD) missions.

This Artificial Intelligence (AI) technology also makes VideoRay's Mission Specialist systems easier to use. Perception technology can locate and identify objects before human operators can—saving time and money. Autonomous control adds functionality by using the system's sensor data to better understand and react to the environment. Autonomy is not only being applied to navigation tasks, but also to complex intervention tasks including cleaning and manipulation.

Mission Specialist Modules

VideoRay will roll out these new solutions over the next 3-12 months by introducing new Mission Specialist modules. The Autonomy Engine module is a subsea Edge processor that enables system control at the vehicle. Subsea vehicle batteries provide power at the vehicle instead of at the surface through the umbilical. This will enable the ROV to operate and "return home" if the umbilical is severed. This battery technology will enable tether-less ROV operations.

Perception and Autonomous technology is valuable for most Defender uses—from

Defense to Offshore Oil & Gas to Renewables Inspection and Aquaculture.

Available later this year is an advanced camera system that builds a 3D point cloud model of a target object from camera images. These models provide operators with valuable, precise information even in poor visibility. This 3D model enables an operator to continue their inspection after the mission and even perform precise measurements. Autonomous technology will navigate the system to collect the data on assets. Point cloud modeling will change how underwater inspections are performed, saving time, and providing ROV operating companies with better, more detailed deliverables.

Rapid Deployment

The VideoRay Mission Specialist Defender ROV system utilizes interchangeable, modular components residing on a single platform. Operators can quickly and easily integrate tooling, sensors and payloads in the field to meet mission objectives and maximize uptime.

Because VideoRay ROV customers can be up and running quickly—completing successful missions within just a few weeks of purchase—they enjoy a rapid return on their investment. In addition, they also protect their investment. Every system from VideoRay can be upgraded to integrate these technologies at any time—without having to buy a new system.

About VideoRay

VideoRay delivered its first ROV system in 2000 and has since become the world's leading manufacturer of underwater, portable, inspection-class ROVs. VideoRay ROVs help prevent terrorism, find and retrieve objects, inspect infrastructure both inland and offshore, and keep divers safe from hazardous conditions. Operators prefer VideoRay systems because they are optimized for intuitive operation, performance, size, weight, payload, and deployment speed.

For more information, visit: videoray.com or call +1 610-458-3000.



» Office of Naval Research, Naval Information Warfare Center (NIWC), Unmanned Maritime Vehicles Lab. (Photo credit: VideoRay)

OBSERVATION ROV

SUBSEA TECH

WWW.SUBSEA-TECH.COM

Gregory Maurin | gregory.maurin@subsea-tech.com



MINI-ROV TORTUGA

The Mini TORTUGA is a 300m depth rated underwater inspection robot inspired from the Tortuga ROV. Built on the same principles and following similar form factor, the Mini-Tortuga is lighter and smaller than the standard Tortuga. Each one of the 4 horizontal thrusters develops a 2.5 kgf thrust and is manually adjustable to preset orientation configurations (vectored, in line, lateral). This system allows operating the ROV in strong current conditions up to 3 knots, regardless of the direction.

(Customizable)



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WWW.GNOMROV.COM

info@gnom-rov.com



SUPERGNOM

The most advanced model Super Gnom can be equipped with the manipulator (grabber), scan sector sonar (Micron TriTech or analogue) and USBL positioning system. More powerful thrusters & additional illumination are installed on this ROV. It can be modified for operation at depths up to 200m.



UNDERWATER ROBOTICS, LLC

WWW.GNOMROV.COM | info@gnom-rov.com



GNOM BABY

The ROV GNOM Baby is a micro sized vehicle that has all the main features inherited from larger underwater systems. The vehicle combines low cost with the full set of GNOM capabilities.



GNOM STANDARD

The GNOM Standard is a basic model of compact ROVs GNOM. It has small size, thin umbilical cable and very high maneuvering capability which allows operating in hard-to-reach places including inside sunken wrecks.



VIDEORAY LLC

WWW.VIDEORAY.COM | Sales | sales@videoray.com



VIDEORAY PRO 4

The VideoRay Pro 4 is one of the most advanced, capable, and versatile small ROVs on the market today. Completely computer-driven by VideoRay Cockpit, a sleek, intuitive, and powerful software platform, the Pro 4 is the most advanced ROV in its class. Its advanced technology and software platform makes it easy to incorporate advanced features such as vehicle autonomous control, the latest imaging sonar, upgraded positioning hardware and software as well as other sensors and tools.

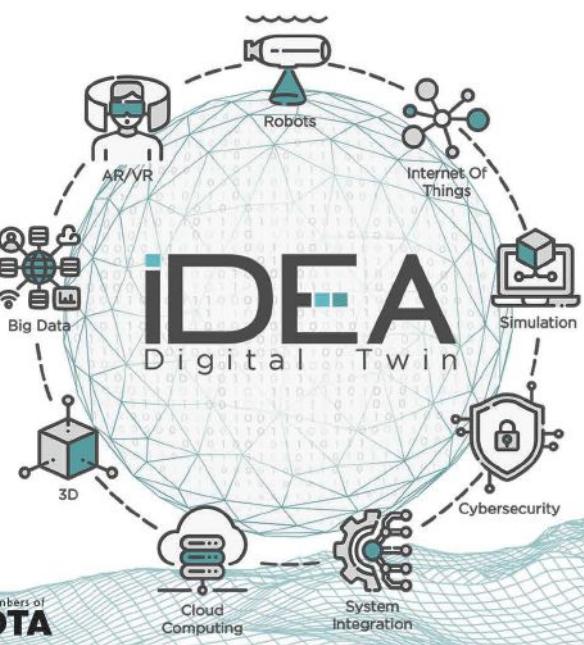
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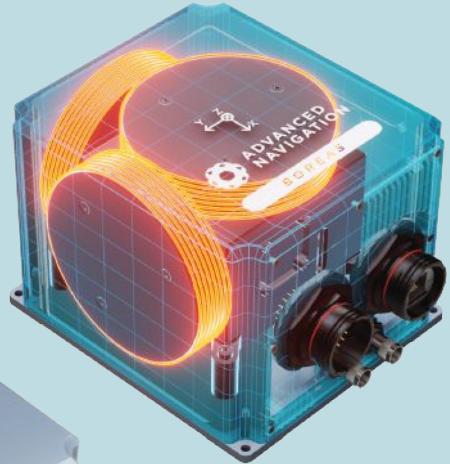
3D Interactive, Digitally Connected,
multi-sector testbeds for collaborative
R&D of manual mechanical systems to
advanced autonomy, artificial
intelligence and advanced data
analytics.





BOREAS INCORPORATES REVOLUTIONARY DFOG TECHNOLOGY

» Designed and built for reliability and high performance, Boreas components are tested to safety, environmental (IP67) and Mil-Spec standards. (Image credits: Advanced Navigation)



» The shrinking of critical optical components onto a single chip proved a key factor in reducing SWaP-C and improving reliability and performance of the Boreas DFOG.

Boreas takes the fiber-optic gyroscope (FOG) into a new era with patent-pending digital fiber-optic gyroscope (DFOG) technology. Three different, yet complementary, technologies have been developed from over two decades of collective research in conjunction with two renowned academic institutions to create DFOG.

- **Digital Modulation:** A specially developed digital modulation technique passes spread spectrum signals through the coils. This allows in-run variable coil errors to be determined and removed from measurements, making DFOG significantly more stable and reliable than FOG. It also allows a shorter coil length to achieve the long coil accuracy.
- **Optical Chip:** Integrating several sensitive components into a single chip and removing fiber splices, size, weight, and power are reduced considerably while significantly improving reliability and performance.
- **Optical Coil:** A specially designed closed-loop optical coil takes full advantage of the digital modulation techniques. This optimizes in-run variable coil error detection and provides high levels of protection for optical components against shock and vibration.

Professor Arnan Mitchell, Director of the Integrated Photonics and Applications Centre at RMIT University, was a key partner in developing DFOG with Advanced Navigation. Professor Mitchell, a noted authority on microtechnology and nanotechnology, worked on shrinking fiber-optic gyroscope components onto a single chip, which proved a key component of DFOG. This innovation enabled a significantly lower SWaP-C than similar devices, while delivering higher accuracy and improved reliability.

"By printing optical components onto a tiny chip, we are creating more compact and reliable fiber-optic gyroscopes with Advanced Navigation" says Professor Mitchell.

Boreas is capable of measuring rotation of the Earth, which enables it to determine heading in moments, without GNSS or magnetometers. Advanced Navigation's north-seeking algorithm allows the system to

acquire accurate heading in both static and dynamic conditions, and at high latitudes.

Advanced Navigation's revolutionary sensor fusion algorithms are foundational to Boreas and provide marked improvements in accuracy and precision over typical and extended Kalman filtering. The system utilizes deep artificial intelligence neural network capabilities that extract significantly more information from sensor data and enables high performance machine learning. System performance is rated at roll and pitch of 0.005°, heading of 0.01° seclat, bias instability of 0.001°/hour, and position accuracy of 10 mm. The result is an ultra-high accuracy, strategic-grade inertial navigation system (INS), offering a 40% reduction in size, weight, power, and cost relative to competing systems.

"Boreas is the first product on the market to offer our patent-pending DFOG technology. DFOG represents a step-change for fiber optic gyroscopes. With Boreas ultra-high accuracy and strategic-grade performance combined with the reduction of size, weight, power, and cost by 40%, we will be able to enable new industries and applications that were never possible before," said Xavier Orr, CEO and co-founder of Advanced Navigation.

Like all Advanced Navigation products, Boreas is designed and built for reliability and high performance. All components are tested to safety, environmental (IP67) and Mil-Spec standards, with a mean time between failure (MTBF) of 500,000 hours. The system is extremely resilient to shock and vibration, allowing it to be used in the most extreme conditions.

Additional features include Ethernet, CAN and NMEA protocols, and a disciplined PTP time server. A feature rich embedded web interface provides full access to internal functions and data, with internal storage capable of a year of data logging. Boreas is targeted at applications requiring high availability, ultra-high accuracy orientation and navigation, including marine, surveying, underwater, aerospace, robotics, and space.

For more information, visit: www.advancednavigation.com.

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ARGUS REMOTE SYSTEMS AS

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ARGUS ROVER

Observation class ROV that can do light work. Can be fitted with 1 or two manipulators for light work. (Customizable)



VC&L | NDT | A&T



ARGUS MINI

Observation class ROV that can be fitted with an open/close manipulator. (Customizable)



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BLUELINK, LLC

WWW.THESARBOT.COM | Jeff Conger | jeff_conger@hotmail.com



SARBOT

Designed specifically for First Responders, the SARbot™ (Search & Recovery Robotic System) is a highly capable & low-cost tool for searching, locating and identifying submerged targets in marine environments. Designed from a base ROV platform that has more than 3000 systems in the field, the SARbot™ has been optimized to allow the operator to work in low to zero visibility conditions, recover targets and work with an unlimited search time. (Customizable)



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BOXFISH RESEARCH

WWW.BOXFISH.NZ | Vera Bronza | info@boxfish.nz



BOXFISH ALPHA

A reliable and versatile best-in-class ROV for asset inspection and light intervention work at depths of up to 300m. Customised to optimise functionality but reduce cost, Alpha delivers 4K live video, 20MP stills, 6x true 4K zoom, 3-12 hours power endurance, and is upgradeable with up to three add-ons. (Customizable)



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BOXFISH LUNA

The only next-generation professional cinematography ROV integrating a full-frame camera capable of shooting up to 4K ProRes RAW video at 30p and 50MP stills. The actively stabilised vehicle can travel and orientate itself in any direction, ensuring super-smooth and creative shots. The surface console also enables precise management of camera settings. (Customizable)



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BOXFISH ROV

Industry-leading actively stabilised, highly-manoeuvrable ROV for underwater research delivering 4K live video and 20MP photos from depths of up to 1,000m with near-zero latency. This lightweight and portable vehicle is easily operated with pilot-assist features and deployable by hand with two crew. The system offers integration of up to eight sensors. (Customizable)



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COPENHAGEN SUBSEA A/S

WWW.COPENHAGENSUBSEA.COM
Sales | sales@copenhagensubsea.com



GORILLA ROV

The Gorilla from Copenhagen Subsea is particularly robust and reliable in challenging subsea environments in the offshore industry. It is equipped with an intelligent state-of-the-art Dynamic Positioning (DP) system and is based on Copenhagen Subsea's successful rim-driven thruster technology and standard electronic components from OMRON, making it easy to maintain. (Customizable)



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PHANTOM® FIREFLY

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(Customizable)



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PHANTOM® P-150

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PHANTOM® S-SERIES

The Phantom® S-Series is a portable high performance ROV that combines superior power, telemetry, and payload with ease of use, ruggedness and reliability. This provides a powerful overall performance envelope and versatility compared to other vehicles of its class. The S-Series can be configured with either 6 or 8 thrusters that enable aggressive lift capabilities and significant control in harsh conditions while reaching depths up to 1,000 meters. (Customizable)



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REVOLUTION ROV

The REVOLUTION is the most intuitive and stable ROV for underwater surveys and inspections, built tough to survive harsh underwater conditions to accomplish complex missions.



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PHANTOM® L6

PHANTOM® L-SERIES
The Phantom® L-Series is an inspection-class underwater remotely operated vehicle, designed for use in numerous applications across a spectrum of industries. The Phantom® L6 is designed with four vectored horizontal and two vertical Tecnadyne® thrusters, which provide significant control and propulsion in current. (Customizable)



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ECA GROUP

WWW.ECAGROUP.COM | Anthony Penn | sales.robots@ecagroup.com



H300 MK2

ECA Group's H300 MK2 is a man portable and compact size remotely controlled vehicle (ROV) for subsea operations up to 300m depth. In its basic version, it is already equipped with a high performance viewing system; furthermore, its modular design permits the easy incorporation of options such as a wide range of sonar, manipulator arms, tools and any type of sensors.



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H300V

Observation Class ROV with 4 horizontal vectored thrusters for inspection missions in very harsh environments, up to 300 m depth. Modular design and easy configuration thanks to a wide range of cameras, sonars, manipulator arms, tools, and any type of sensors.



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3 LEVELS OF DVR SPECIFICATION



Digital Edge Subsea is a world leader in offshore digital video recording (DVR) and inspection systems.

Digital Edge Subsea develops and manufactures DVR products for use throughout the offshore oil and gas industry including diving, remote operated vehicle (ROV) and topside operations.

Our EdgeDVR is currently used worldwide by most of the major ROV and diving contractors.

The EdgeDVR is an essential part of any ROV system and can be integrated into both work-class and eyeball ROV systems, it's simple to use and full of very useful features. There are currently over 500 units in the field with a truly established proven history of reliability.

DIGITAL EDGE SUBSEA

www.digitaledgesubsea.com

OBSERVATION ROV WITH PAYLOAD OPTION

ECA GROUP

WWW.ECAGROUP.COM | Anthony Penn | sales.robots@ecagroup.com



H800

Observation Class ROV and light duty work system for subsea observation, inspection and surveillance in strong currents, up to 1000 m depth. Modular design and easy configuration thanks to a wide range of cameras, sonars, manipulator arms, tools, and any type of sensors.



R7

Fast, modular and easy to deploy, the R7 is designed for oceanographers, hydrographers, fish farmers and operators of submerged structures for all their underwater missions up to a depth of 300 m, including inspection, observation, surveillance, maintenance and object recovery. The R7 incorporates the expertise accumulated by ECA GROUP over more than 40 years as a supplier of autonomous underwater vehicles for civilian and military applications.



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FORSSEA ROBOTICS

WWW.FORSSEA-ROBOTICS.FR
Gautier Dreyfus | gdreyfus@forssea-robotics.fr



ARGOS

ARGOS ROV embraces the latest advances in ROV technology that the industry has come to demand and expect from modern ROV design. ARGOS is compact in design and is primarily suited to inspection and light intervention tasks. The vehicle is powerful enough to perform maintenance and repair duties with use of the optional electric five function manipulator arm and tooling skid interfaces. (Customizable)



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FORSSEA ROBOTICS

WWW.FORSSEA-ROBOTICS.FR
Gautier Dreyfus | gdreyfus@forssea-robotics.fr



ATOLL

ATOLL (patented system) is an observation class-ROV deployable from a light vessel. The system can perform a fully autonomous approach and docking based on embedded control algorithms. Once the link is obtained to the seabed target, ATOLL can either transfer power & data, or mechanically engage the target for recovery back to surface and valve manipulation. (Customizable)



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FORUM SUBSEA TECHNOLOGIES

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COMANCHE

Comanche is the logical choice when seeking the ultimate 'all around' electric ROV. Offering a generous auxiliary hydraulic package for work class manipulation and tooling combined with an advanced and powerful control and diagnostics package for survey and other data collection missions, the Comanche offers high performance, high reliability and high adaptability.



MOHICAN

Mohican was specifically developed to cope with the fast moving and unpredictable turbid waters of the southern North Sea. The 'dynamic vector' feature enables the operator to adjust thruster angles on the fly for agile maneuvering and the 3000v 400Hz power system is particularly suited to long tether excursions and deep liveboating operations.



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SUPER MOHAWK

Super Mohawk is a robust, durable and long proven ROV system designed for high payload, with plenty open deck space and skid mounted options.



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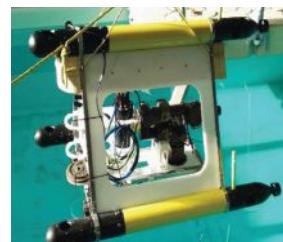
FUGRO BLUE VOLTA (EROV)

The world's most advanced remotely operated vehicle (ROV), with deployment from an uncrewed surface vessel (USV), and equipped with the latest in electronic hardware, software and artificial intelligence (AI). Whilst retaining the capability to be operated conventionally from an ROV survey vessel, barge, platform or rig, the Blue Volta is also the world's first ROV designed to be remotely controlled from Fugro's global network of ROCs as an over-the-horizon ROV without needing a parent vessel or ROV pilot nearby.



GRAAL TECH

WWW.GRAALTECH.COM



R-300

R-300 is the ROBUST vehicle of the X-300 family, designed for carrying bulky and heavy payloads. It is constituted by three short X-300 AUVs which are attached to a triangular aluminium frame supporting the installation of many different equipment of interest. A connection module mounted at the bow of each X-300 provides a common power and data link among the three composing AUVs and enables their effective motion coordination. As a result, R-300 is an extremely agile vehicle with high maneuverability, that can operate either as a standard AUV, or as a ROV thanks to the available fiber-optic tether.



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EXRAY

Truly wireless mini-ROV for inspections of complex confined submerged infrastructure. EXRAY can be remote-controlled and send live HD video back to the pilot, no tether attached. It offers 6 DOF, hovering, modular payload bay (for UT or gripper) and up to 6 hours of autonomy. Multi-camera system for SLAM navigation. (Customizable)



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KYSTDESIGN

WWW.KYSTDESIGN.NO

Sales | post@kystdesign.no



SURVEY ROV

KYSTDESIGN has over the past years developed two specialised ROV's for survey purposes. The Surveyor Interceptor was developed for a joint venture between Reach Subsea and MMT. The Superior was developed for DeepOcean. Both ROV's are developed with focus on high speed and high capability for carrying survey sensors.



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L3HARRIS

WWW.L3HARRIS.COM

Giuseppe Ranieli | Calzoni.Sales@L3Harris.com



AGEOTEC ROV ANTARES

L3Harris' AGEOTEC ROV Antares features as many as two HD cameras. It is equipped with as many as four 4K lumen LED lights and supports up to 14 Kg payload. The vehicle can reach 400 msw depth and it's operated using a portable control unit, contained in a trolley suitcase. (Customizable)



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L3HARRIS

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AGEOTEC ROV LYRA

The ROV Lyra features an exceptional payload capacity and an amazing weight-to-power ratio for an observer class remotely operated vehicle. Reaching up to 300 msw depth, Lyra features a modular chassis manufactured in non-corroding high impact resistant polypropylene. (Customizable)



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AGEOTEC ROV PEGASO

Representing the ideal light-work class solution. The Pegaso reaches 2000 msw depth and is capable of 150kg payload. Its dedicated skid - suitable for any kind of survey equipment - can be accessorized with a 7 function manipulator. Pegaso it's perfect for inspecting, monitoring, surveying, target detecting and construction supporting. (Customizable)



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AGEOTEC ROV PERSEO

Perseo represents the perfect multitasking solution. With as many as 25 kg payload and as many as three real-time cameras, the vehicle is equipped with an inertial measurement unit providing high accuracy heading position. It can reach a 600msw depth and can be customized using a wide range of accessories. (Customizable)



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L3HARRIS

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AGEOTEC ROV PERSEO GTV

The Perseo GTV is a multi-purpose class ROV capable of amazing performances. Reaching a 1500 msw depth, the Vehicle supports up to 40 kg payload and is equipped with multiple HD real-time cameras. Perseo GTV can be customized using many accessories, including sonar and multi-beam echosounder. (Customizable)



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MARINER UNDERWATER ELECTRONICS

WWW.MARINER.GR

Marinos Pittas | marghe@otenet.gr



MARINER MRM 230 R.O.V.

The MARINER MRM 230 R.O.V. is one of the latest additions in our range of products for Underwater use. It can operate to a depth of up to 250 meters and has been designed so as to be used for professional inspection and survey works in offshore waters. Orientated to ease of use and meticulousness, MRM serves as a powerful tool to the professional operator.



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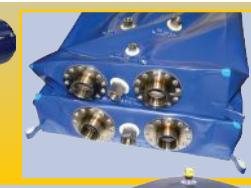
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- Wide Selection of Fittings & Attachments



MARISCOPE MEERESTECHNIK

WWW.MARISCOPE.DE | Niklas Becker | n.becker@mariscope.de



DIAVOLO III

The next evolution of the FO III adding a lateral thruster to improve the side-wards movement, with the same 24/7 work capabilities. Its open frame construction allows an easy adaptation of accessories and allows an easy maintenance.

Diavolo III can be adapted following the customer's requirements. Lifetime warranty. (Customizable)



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CHAMELEON

The Chameleon is a pure scientific ROV specially developed taking into account the applications and needs of the scientific community. Completely modular in structure and equipment, the Chameleon is configured with the client according to the tasks and scientific research missions that need to be carried out. Lifetime warranty. (Customizable)



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OBSERVATION ROV WITH PAYLOAD OPTION

MARISCOPE MEERESTECHNIK

WWW.MARISCOPE.DE

Niklas Becker | n.becker@mariscope.de



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FO III

Manufactured in stainless steel, manually TIG-welded, equipped with powerful thrusters, designed to 24/7 use, easy to maintain, robust and stable. Full HD/4K cameras and high output LED-lights. With its open frame, can be equipped with additional accessories like electric manipulators, lasers, sonars and tracking devices. Wireless steering console. Lifetime warranty. (Customizable)



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WWW.SEASAM.NOTILOPLUS.COM

Solène Guéré | contact@notiloplus.com



OCEANBOTICS

WWW.OCEANBOTICS.COM

Sales | sales@oceanbotics.com



OCEANBOTICS SRV-8 ROV

The SRV-8 is designed for superior performance, equipped with RJE's exclusive 8 thruster DVCTM (Dynamic Vector Control) for the most advanced maneuverability on the market today. Operating the vehicle is easy with a simple set up, one-person portable system and the ability to deploy in 3 minutes or less. (Customizable)



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OCEANEERING

WWW.OCEANEERING.COM



GLOBAL EXPLORER ROV

The Global Explorer ROV offers a complete suite of scientific tools for mid-water and benthic sampling, including: detritus sampler, rotary suction sampler, jet pump, push cores/quivers, and an insulated bio box. The Schilling ORION seven function spatially correspondent manipulator arm extracts fragile coral and artifacts with delicate precision.



OBS | SUR | VC&L



OMNI MAXX ROV

The Omni Maxx ROV is a true deepwater observation and inspection system that operates independently and provides high-definition images of subsea environments. The system consists of the ROV and a tether-management module with up to 820 ft (250 m) of tether cable.



OBS | INS | SUR



Smooth and connected.



Extend your missions
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Salinity, density, speed of sound, and more, the **RBR/legato³ C.T.D.** extends the measurement capabilities of gliders and AUVs. The CFD-optimized, pump-free design uses 90% less power than traditional CTDs and is unaffected by surface contaminants or freezing conditions. This enables longer deployments or high-resolution sampling in a wider range of environments. The **RBR/legato³ C.T.D.** can also seamlessly integrate and control additional sensors to simplify integration, configuration, and data management.

RBR

SENSORS | LOGGERS | SYSTEMS | OEM

rbr-global.com

OBSERVATION ROV WITH PAYLOAD OPTION

OCEANEERING

WWW.OCEANEERING.COM



SEA MAXX ROV

The Sea Maxx satellite ROV is designed and built to work in tandem with work class ROVs at depths up to 14,400 fsw (4,400 msw). The system enables inspection of difficult-to-reach and confined areas, and is deployed from a separate housing welded beneath the work class ROV.



OBS | INS | SUR

OUTLAND TECHNOLOGY

WWW.OUTLANDTECH.COM | Jeffrey Mayfield | jeff@outlandtech.com



ROV 2000

"OUTLAND 2000". 1000 ft (300 meter) rated. Now with LED lights. The ROV utilizes brushless DC, magnetically coupled thrusters. Outland designed a control system around these thrusters to maximize the power. Tilting Camera forward give High Resolution and low light Color in one small package. A rear fixed camera is standard. The ROV can now use a 1000 ft cable. Standard system ships with 500 ft.



OBS | SUR | INS



ROV 2500

"OUTLAND 2500". 1000 ft (300 meter) rated. Now with LED lights. The ROV utilizes brushless DC, magnetically coupled thrusters. Outland designed a control system around these thrusters to maximize the power. Tilting Camera forward give High Resolution and low light Color in one small package. A rear fixed camera is standard. The ROV can now use a 1000 ft cable. Standard system ships with 500 ft. (Customizable)



OBS | SUR | INS

POSEIDON ROBOTICS, LLC

WWW.POSEIDONROV.COM | Peter Schubert | Peter@poseidonrov.com



LANAI

Designed by ROV operators for complicated operations. The Lanai offers more uptime and more payload. Ready to use in a capable and affordable package. (Customizable)



OBS | SUR



LANAI PRO

Everything You Need, and MORE POWER. With all the Options of the Lanai, the Pro is Designed to handle Higher Currents and provides an Extra Video Input, 2kW of Power, and a 22in HD Monitor integrated into the Console. (Customizable)



OBS | SUR



MAUI

Designed with Large Payloads in mind. This system is ideal for Survey Work or Heavy Lifting and can be fitted to carry a Coda Octopus 3D Sonar, INS, Multibeam Profilers, or Sub Bottom Profilers. (Customizable)



SUR

SAAB SEA EYE

WWW.SaabSEAeye.COM | James Douglas | solutions@saabseaeye.com



SEA EYE FALCON

The Falcon is the most successful underwater electric robotic system of its class and is proven in numerous intricate and demanding missions across many commercial, security and scientific sectors. The Falcon is lightweight, sized just one metre long and is rated to a depth of 300m or 1000m. (Customizable)



OBS | INS | SUR | VC&L | A&T | NDT



SEA EYE FALCON-DR

The Falcon concept is the most successful underwater electric robotic system of its class and is proven in numerous intricate and demanding missions across many commercial, security and scientific sectors. The Falcon-DR is lightweight, sized just over one metre long and is rated to a depth of 1000m. (Customizable)



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SEA EYE LYNX

The Lynx is a leading observation and inspection vehicle for missions in water depths of up to 1,500m. It is fitted with two vertical and four horizontal thrusters making it a very stable platform with exceptional manoeuvrability. A wide range of tools and sensors are available as well as interchangeable tooling skids. (Customizable)



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SEA EYE TIGER

Widely regarded as the leading observation and inspection vehicle within the oil and gas industry, the Tiger is also increasingly chosen by defence and marine science seeking increased capability in deep water. The Tiger is a very stable platform, with excellent manoeuvrability and performance in strong currents. (Customizable)



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OBSERVATION ROV WITH PAYLOAD OPTION

SEAMOR MARINE LTD.

WWW.SEAMOR.COM

Sales | sales@seamor.com



SEAMOR CHINOOK ROV

The Chinook is an industrial grade inspection ROV with a wide range of capabilities. The Chinook offers a stable platform yet remains compact and can be rapidly deployed with ease by two people. (Customizable)



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SEATRONICS

WWW.SEATRONICS-GROUP.COM

Jamie Neilson | jamie.neilson@seatronics-group.com



SEAMOR MAKO

With a large open frame design and versatile mounting options, this vehicle can carry a variety of accessories and has the power capacity to run them all at once. The Mako's payload (14 kg standard, upgradable to 22.5 kg) allows users to install heavy instrumentation, including multi-beam imaging sonars. Users can easily mount and position accessories without any special tools. The ample space in the accessory bay also improves flow-through, which ensures maximum thruster efficiency, making it easy to fly the Mako no matter the payload.



OBS | SUR | INS



VALOR

The VALOR is one of the lightest yet most powerful Observation ROVs available. 300m depth rated, however the unique design allows the vehicle to be extended up to 1000m. The VALOR versatility is limitless given the significant payload, unrivalled power capability and available bandwidth allowing the ROV to manage complex tooling and sensor packages. (Customizable)



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SHARK MARINE TECHNOLOGIES INC.

WWW.SHARKMARINE.COM | Sales | sales@sharkmarine.com



BARRACUDA

Designed for speed and power, the Barracuda is very capable in high current applications. Constructed using high-tech plastics, anodized aluminum and syntactic foam, it is small and maneuverable. It is also large enough to support the easy addition of mission specific accessories (e.g. sonar and video systems). All accessories fit inside the frame to avoid entanglement issues. The built in Total Navigation System, and DiveLog software, give the it full geodetic positioning and autonomous capabilities.



SEA-WOLF 5

The SeaWolf-5 is a ROV unlike any other. A true light/medium work class ROV, the SeaWolf-5 packs a lot of power and modularity into a small frame. Customers can choose from a 4 or 6 thruster model or upgrade at any time. The SeaWolf-5 operates autonomously or semi-autonomously using Shark Marine's "DiveLog".



SUBMERSIBLE SYSTEMS INC.

WWW.SSIROVS.COM | Wolfgang Burnside | office@ssirovs.com



TRV-005

The Ultimate ROV for serious Offshore Platform Inspections and Pipeline Survey Work, no other ROV comes close to the rugged, reliable and incredibly maneuverable TRV-005.



TRV-M

A versatile vehicle often undertaking Workclass tasks in areas that prohibit access to larger Vehicles. The moderate payload also allows the secure attachment of additional Equipment/ Sensors to the T6061 Aluminum frame. The TRV-M high mass / Thrust ensures easy transitions from the Surface to the Seabed to either its standard depth rating of 1000m or to the optional 3000m depth rating.



TELEDYNE SEABOTIX

WWW.TELEDYNEMARINE.COM | SeaBotix_Inquiries@teledyne.com



VLBV300

The SeaBotix vLBV® represents an evolution in small, capable, vectored MiniROV systems. Four powerful 100 mm (4 in) horizontal thrusters, arranged in a vectored format, offer nearly equal horizontal thrust in all 360-degrees of flight. (Customizable)



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SUBSEA TECH

WWW.SUBSEA-TECH.COM

Grégory Maurin | gregory.maurin@subsea-tech.com



TORTUGA

Tortuga has 4 horizontal thrusters (4x20kgf) fitted with a unique azimuthal control system allowing operations in currents up to 4 knots, regardless of the direction. With an unrivaled 1.8 thrust to weight ratio and a fully integrated acoustic imaging solution, Tortuga is the ultimate vehicle for underwater inspections in harsh operational conditions. (Customizable)



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VLBV950

The SeaBotix vLBV® represents an evolution in small, capable, vectored MiniROV systems. Four powerful 100 mm (4 in) horizontal thrusters, arranged in a vectored format, offer nearly equal horizontal thrust in all 360-degrees of flight. Standard features include a high-resolution color camera, powerful LED lighting, depth, heading and temperature sensors, auto-depth, auto-heading and thruster trim, low-drag neutrally buoyant tether, and fully ICC with daylight-readable monitor. (Customizable)



OBS | INS | SUR

OBSERVATION ROV WITH PAYLOAD OPTION

VIDEORAY

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MISSION SPECIALIST PRO 5

The VideoRay Mission Specialist Pro 5 configuration is designed for speed and efficiency, weighing in at 10kg (22lb). The three-thruster system has forward speed of over 4.4 knots, and utilizes a system of interchangeable, modular components residing on a single, intelligent network. The Pro 5 is designed to handle missions with size, space, weight, and deployment speed constraints, such as infrastructure inspections beyond the reach of divers, search & recovery, exploring the ocean floor up to 305m, and various others. The Pro 5 builds on the strengths of the Pro 4, with more thrust, longer tether lengths, higher resolution video, and the advantages of the MSS modular systems.



OBS | SUR | INS | VC&L | A&T



MISSION SPECIALIST DEFENDER

The Mission Specialist Defender configuration is designed for more precise control of the vehicle position and orientation, heavier payloads, and demanding intervention, such as rendering unexploded ordinance safe or cleaning nets for offshore fish farms. With seven thrusters, the Defender is able to move in any direction, and maintain active pitch to face the vehicle in an upward or downward orientation. The addition of third party control and navigation software from Greensea Systems or Seabyte makes the Defender a popular configuration for dangerous or heavy-duty missions. (Customizable)



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CUSTOM MISSION SPECIALIST

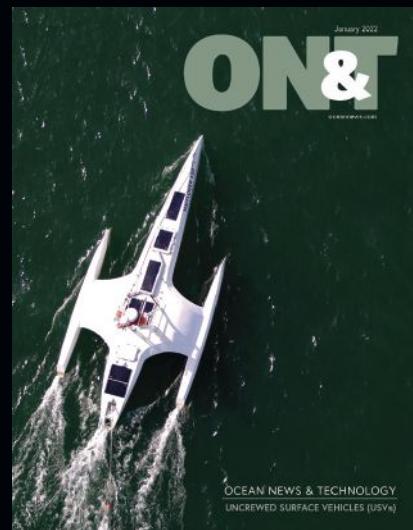
The modularity of VideoRay's Mission Specialist technology enables easy maintenance, fast repairs, simple upgrades, and seamless integration across configurations. Each configuration consists of several modules developed by VideoRay or our tool and sensor specialist partners so you know that you're receiving the highest quality parts made exactly for your system. (Customizable)



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» Isurus ROV fleet has yet to encounter a current that could shut down operations.
(Photo credit: Oceaneering)

DESIGNING WORK CLASS ROVs FOR THE FUTURE

As the offshore industry looks toward sustainable energy production, remotely operated vehicles (ROVs) will need to respond to new industry challenges by featuring a more robust design, increased functionality, and a lower carbon footprint.

Oceaneering was challenged to increase the current conditions at which a work class ROV can operate. Traditional work class ROV systems are designed to operate powerful tooling in deep water environments, but they struggle to operate in tidal currents exceeding 1.5 knots.

Without an ROV to monitor or execute operations, work stops, and the offshore support vessel is put on hold until conditions improve, leading to cost overruns. The

benefits of expanding an ROV's operating window in harsh currents are apparent when one considers that the typical cable lay or construction vessel day rate averages approximately US\$250,000.

HIGH-SPEED WORK CLASS ROV

Working with clients, we identified a hydrodynamic work class ROV form factor that could significantly increase its speed in water and enable projects to continue in currents exceeding 2.5 knots. Oceaneering introduced the Isurus™ ROV, a high-speed, work class system in 2019.

Since its launch, the vehicle has demonstrated its ability to improve economics for offshore renewables projects by expanding the operating currents and vehicle speeds beyond those achieved by traditional work class ROVs.

To design the vehicle, we used our Magnum® Plus ROV to leverage its existing powertrain design, turning it into a hydrodynamic vehicle with increased operational capabilities and the ability to achieve speeds up to 5 knots. Unlike other high speed ROVs, the Isurus is a fully capable work class system with two hydraulic manipulators that can deliver the same hydraulic and electric power for tools and payloads as the Magnum® Plus vehicle.

INNOVATIVE SOLUTION FOR RENEWABLES

Thanks to its success, the Isurus fleet has grown to six systems that are currently in operation in Northwest Europe and East

Asia. The vehicles are supporting offshore wind and tidal project construction and have not encountered currents that exceed the systems' capabilities to maintain station and execute work class tasks.

Prior to the implementation of Isurus, regular work class ROVs were often unable to execute these same construction tasks for a period of up to 25% of any given day due to severe tidal currents.

Shallow water environments also present visibility challenges for traditional work class ROV systems. Isurus includes an innovative solution that supports switching between multiple high resolution imaging sonars during operations to enable work to continue even in highly turbid environments.

After more than two years in operation, the Isurus ROV fleet has yet to encounter a current that could shut down operations. With 2,139 days of operations accumulated across six systems since November 2019, the Isurus fleet has amassed over 11,000 dive hours with 99.7% uptime.

Oceaneering's Isurus ROV continues to provide differentiated project economics to the global offshore renewables market. The Isurus ROV provides a direct replacement solution to today's work class systems while increasing operational windows, project efficiency, and lowering carbon footprint.



» The Isurus fleet has amassed over 11,000 dive hours with 99.7% uptime. (Photo credit: Oceaneering)

For more information, visit:
www.oceaneering.com.

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AKVA GROUP | SPERRE ROV TECHNOLOGY

WWW.SPERRE-AS.COM | post@sperre-as.com



FLYING NET CLEANER 8

Remote operated net cleaner easy to operate, auto functions thruster propulsion (no damages from wheels, belts or nozzle minimal waste).



INT



SUB-FIGHTER 10K

The SUB-fighter 10K is a powerful ROV and a "work horse". We have delivered more than 40 systems of this type of ROV that are being used for all kinds of work and inspection down to 3000 meters.



SUR | INS | CON | INT



SUB-FIGHTER 15K

The offshore version of SUB-fighter 15k is an ROV with vectorized horizontal thrusters tailor designed for use with subsea installations together with TMS.



CON | INT



SUB-FIGHTER 30K

SUB-fighter 30K is our most powerful ROV. The system has been delivered to Hydro and NTNU, amongst others.



SUR | INS | CON | INT



SUB-FIGHTER 3000

ROV designed for tough conditions. Reliable and well proven design. Quick and easy mobilization. Very good stability. Plenty of power.



SUR | INS | CON | INT



SSUB-FIGHTER 5500

The SUB-fighter 5500 has been produced for Norwegian environments. This is a ROV with a lot of options at a low cost.



SUR | INS | CON | INT

ALERON LIMITED

WWW.ALERON-GROUP.COM

info@aleron-group.com



MULTIROV

The MultiROV was designed to offer the operator a flexible solution to subsea remote operations and can be configured to meet changing and demanding operational requirements. MultiROV is simple to operate with an advanced control system and 4k video wall display together with class-leading performance, reliability and ease of maintenance. (Customizable)



SUR | INS | CON | INT | VC&L | A&T | NDT VSK



AUXROV

The latest system was built as a 300HP system for power Mass Flow Excavations systems in deep water. The AUXROV system has a SWL of 20t and has been load tested to 3G. New applications for the system are still being identified but so far, we have operated Mass Flow Excavation Systems, Hydraulic Tine Grabs, Hydraulic Clam Shell Grabs, shear cutters, rock bag deployment, and to operate a vast range of survey sensors. (Customizable)



CON | INT

ARGUS REMOTE SYSTEMS AS

WWW.ARGUS-RS.NO | Sales | sales@argus-rs.no



ARGUS MARINER XL

Medium Work class ROV that can be fitted with 2 x 7 function manipulators and has a separate HPU for manipulator and tooling. (Customizable)



SUR | INS | CON | INT



ARGUS WORKER

Heavy Work class ROV for deepwater. Can be fitted with 2 x 7 function manipulators and has a separate HPU for Manipulator and tooling. (Customizable)



SUR | INS | CON | INT



ARGUS WORKER XL

The Argus Worker XL, the powerful and flexible work class ROV. The Argus Worker XL is a powerful electric WROV. Ideal for drill support, survey and IMR (inspection, maintenance & repair). (Customizable)



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DEPOCEAN ENGINEERING

WWW.DEPOCEAN.COM

Sales | sales@deepocean.com



PHANTOM X-SERIES

The Phantom® X-Series is an electric, light work-class, vehicle that packs a robust design for deep sea maneuverability and power. Configured with six vectored horizontal and two vertical Tecnadyne brushless thrusters, the Phantom® X8 has complete control and authority in any given direction, even in the toughest currents.



SUR | INS | CON | INT

An advertisement for Xeos Technologies featuring their NEMO-V submersible data relay. It includes the Xeos logo, a red 'NEW PRODUCT' banner, the product name 'NEMO-V', and a call-to-action button 'LEARN MORE'. The background shows an underwater scene with a submersible vehicle.

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WORK CLASS VEHICLES

DOER MARINE

WWW.DOERMARINE.COM | info@doermarine.com



H2000

DOER's H2000 is a ultra compact work class ROV. Designed for multi-mission use from a variety of platforms, the H2000 can be used for underwater tasks including survey, sampling, search/recovery, NDT and inspection. H2000 is rated for 2000m standard with options for 1000m and 3000m. This versatile, powerful vehicle is designed to take advantage of changing technology to provide years of service and upgradability. (Customizable)



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H6500

Compact work class ROVs ranging from 10-100 hp and depths from 2000m to 6500m. TMS typically used with deeper system. DOER also offers five function manipulators, hydraulic pan/tilt, valve packs, thrusters and a wide variety of sampling, cleaning and custom tools. These systems have a great degree of flexibility in design and can be customized to suit client needs.



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H3000

Compact work class ROVs ranging from 10-100 hp and depths from 2000m to 6500m. TMS typically used with deeper system. DOER also offers five function manipulators, hydraulic pan/tilt, valve packs, thrusters and a wide variety of sampling, cleaning and custom tools. These systems have a great degree of flexibility in design and can be customized to suit client needs.



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ECA GROUP

WWW.ECAGROUP.COM

Anthony Penn | sales.robots@ecagroup.com



H2000

Work Class ROV dedicated to missions up to 2000 m depth: offshore survey and underwater works, search and rescue, object recovery, wrecks inspection. Equipped with high performance viewing system, sonars, and 2 manipulator arms.



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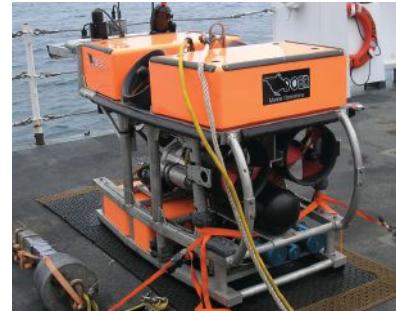


PAP MK6

PAP MK6 is a self-propelled ROV dedicated to mine warfare with a high carrying capacity (NATO Mine Disposal Charge, Cutter). A robust and reliable design with high powered propulsion enables to manoeuvre in strong current and to withstand harsh environmental conditions. User friendly command and control software offers auto piloting functions.



SUR | INS | INT | VC&L | A&T | CD | NDT | VSK

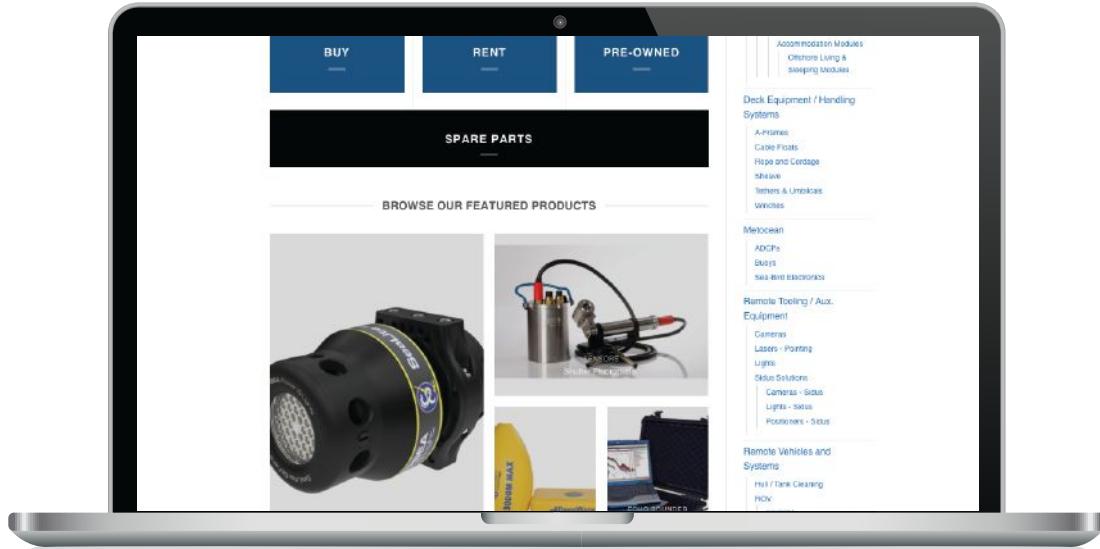


OCEAN EXPLORER

DOER's Ocean Explorer 1000m is a mid size electric ROV. Its open frame architecture is designed to accommodate various sensor and tools with minimal integration effort. Typical applications include survey, sampling, search/recovery, tunnel/pipeline intervention and inspection.



SUR | INS



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WORK CLASS VEHICLES

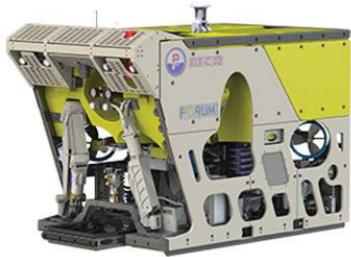
FORUM SUBSEA TECHNOLOGIES

WWW.F-E-T.COM | Sales | rov.sales@f-e-t.com



XLX EVO ULTRA HEAVY DUTY ROV SYSTEM

The Forum Energy Technologies Perry XLX Evo ROV represents the latest evolution in the highly successful Perry XL series. The XLX Evo features significantly enhanced performance across the full range of demanding intervention and survey tasks without compromise to the outstanding reliability for which the XL series of vehicles is renowned throughout the world.



XLX-C HEAVY DUTY ROV SYSTEM

The Perry® XLX-C is a compact heavy-duty work-class hydraulic ROV, complementing the Perry® XLX 150-250 series of larger heavy-duty work-class ROVs.



KYSTDESIGN AS

WWW.KYSTDESIGN.NO | Åge Holsbrekken | post@kystdesign.no



CONSTRUCTOR

This is a general purpose hydraulic work class ROV. The system is characterized by a compact and integrated mechanical architecture, powerful and accessible hydraulic functions and a user friendly real time control system. The CONSTRUCTOR can be delivered with depth rating down to 6000m. It is uniquely designed for carrying and operating large tools and modules. (Customizable)



SUR | INS | INT | CON | VC&L | A&T | CD WT | NDT | VSK



SUPPORTER

SUPPORTER is a general purpose hydraulic work class ROV. The system is characterized by a compact and integrated mechanical architecture, powerful and accessible hydraulic functions and a user friendly real time control system. The system can be delivered with depth rating down to 6000m. (Customizable)



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INTERNATIONAL SUBMARINE ENGINEERING LTD. (ISE)

WWW.ISE.BC.CA | Sales | info@ise.bc.ca



ISE HYSUB

The ISE HYSUB Remotely Operated Vehicle (ROV) is a fully customizable work class ROV which is optimized for your operational profile. Select your payloads, depth, power, and frame size to receive your customized HYSUB in as little as 6 months! Every HYSUB is designed to last for decades in harsh conditions and is easy to modify and upgrade when new technology becomes available. The HYSUB is available from 25-250 hp in depth ratings to 6000m. (Customizable)



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ISE TRAILBLAZER

The ISE Trailblazer is a tethered, high speed, remotely operated vehicle. It is capable of operating to depths of up to 1500 meters in tidal currents, while carrying out a variety of military, scientific, industrial, or mine countermeasure missions. The system has executed trials under operational conditions and has proven its effectiveness in the location, identification, and disposal of underwater objects.



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KYSTDESIGN AS

WWW.KYSTDESIGN.NO

Åge Holsbrekken | post@kystdesign.no



STEALTH CLEANER

StealthCleaner is a full 6 Degrees of Freedom vehicle that can move swiftly and under full control in any direction, which makes it to the most efficient cleaner ROV in the fish farming industry.

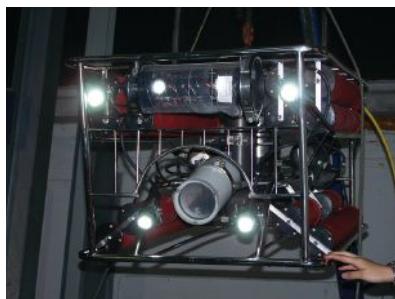


INT

MARISCOPE MEERESTECHNIK

WWW.MARISCOPE.DE

Niklas Becker | n.becker@mariscope.de



COMMANDER MK II

The smallest of these vehicles equipped with 5 thrusters of 300/600 Watt of power each. Depth rated to 500m it can be equipped with a variety of oceanographic sensors, cameras, lights, manipulators and others in order to customize the vehicle according to the individual task and use. Lifetime warranty. (Customizable)



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MARINER UNDERWATER ELECTRONICS

WWW.MARINER.GR | Marinos Pittas | marge@otenet.gr



IPPODAMUS

The MARINER IPPODAMUS ROV is one of the latest additions in our range of products for Underwater use. It can operate to a depth of up to 750 metres and has been designed so as to be used for professional inspection and survey works in offshore waters. It can carry sensors as well as small manipulators making our vehicle a very useful tool in the hands of experienced and professional operators. (Customizable)



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Established in 1957, we design, test and produce Electro Optical Mechanical Cables withstanding the harshest of environments. Our cables support a wide range of ocean applications; from Towed Arrays to Side Scan Sonar's, ROV Tethers and Umbilicals to Seismic Lead-in's and MUX BOP Control cables.

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- scientific and
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SubCtech GmbH
www.subctech.com
info@subctech.com

WORK CLASS VEHICLES

MARISCOPE MEERESTECHNIK

WWW.MARISCOPE.DE | Niklas Becker | n.becker@mariscope.de



COMMANDER MK III

With six thrusters of 300/600 Watt each, disposed in a vectorized manner. 1000 meters operational depth. Its newly developed hydrodynamic design and completely enhanced construction increases the ROVs efficiency. Can carry out all kind of tasks, with special emphasis on searches, rescues, scientific studies and inspections. Lifetime warranty. (Customizable)



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FLUNDER

With six thrusters of 400 Watt each, disposed in a vectorized manner. 500/1000 meters operational depth. Hydrodynamic design and completely enhanced construction with power, speed and maneuverability. Can carry out all kind of tasks under the most adverse situations. Lifetime warranty. (Customizable)



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OCEANEERING INTERNATIONAL, INC.

WWW.OCEANEERING.COM



eNOVUS ROV

The compact work class eNovus ROV is the newest addition to our fleet and is powered by an environmentally conscious, 150-kVA electric (235-hp hydraulic equivalent) propulsion system. This vehicle maintains work class manipulator capabilities via a dedicated hydraulic circuit. (Customizable)



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FREEDOM™ ROV

Freedom provides a new level of flexibility and efficiency while performing common ROV tasks, including survey, inspection, valve and torque tool operations, manipulator-related activities, and underwater inspection in lieu of drydocking (UWILD) operations.



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OCEANEERING INTERNATIONAL, INC.

WWW.OCEANEERING.COM | Sales | rov-services@oceaneering.com



ISURUS™ ROV

The Isurus™ ROV builds on the success of the Magnum® Plus by combining experience, reliability, and full work class capabilities with best-in-class performance in high-current environments. The Isurus™ ROV enables activities in severe current conditions and is ideal for renewables and high-speed ROV surveys.



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LIBERTY E-ROV

The Liberty E-ROV is a 100 kW battery-powered work class resident system that will go subsea with a surface buoy. It is an electric vehicle with hydraulic power to support its manipulator functions. It is well-suited for inspection, maintenance, and repair (IMR), commissioning, and underwater intervention activities. (Customizable)



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MAGNUM® PLUS ROV

The powerful Magnum Plus ROV delivers enhanced flight control in a smaller package. Reliable and easily maintained, it provides a 170-hp, high-thrust, tophat- or cage-deployed system designed for subsea intervention and deepwater tooling. (Customizable)



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MILLENNIUM® PLUS ROV

This powerful ROV features a dual-manipulator, 220-hp work class system with an enhanced thruster configuration that increases lift capacity by more than 50% compared with the standard Millennium ROV system. (Customizable)



OBS | SUR | VC&L | A&T | NDT



NEXXUS ROV

Our high-power, heavy work class ROV system meets the API Standard 53 requirements for BOP intervention. With heavily increased tooling capabilities, the NEXXUS ROV is designed to meet next-generation intervention requirements. (Customizable)



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WORK CLASS VEHICLES

ROVOTICS

WWW.ROVOTICS.AE | Tamer El Essawy | sales@rovotics.ae



SHARK G2R ROV

The Shark G2R ROV features a high-power-to size ratio, with over 80kg of bollard pull while fielding a 35kg payload. With a strong aluminium and polypropylene construction, it is rated for operation at up to 500m, with an optional upgrade extending this to 1000m. The ROV is powered by six high-reliability SPE-75 thrusters. (Customizable)



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SHARK G3R ROV

The Shark G3R ROV features a high-power-to size ratio, with 130kg of bollard pull while fielding a 100kg payload. With a strong aluminium and polypropylene construction, it is rated for operation at up to 500m, with a series of optional upgrades extending this to 1000m, 2000m or 3000m. The ROV is powered by six high-reliability SPE-250 thrusters. (Customizable)



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SHARK G4R ROV

The Shark G4R is Rovotics' largest and most versatile ROV, providing 244kg of bollard pull while fielding a 280kg payload. This light-work-class ROV is rated for operation at up to 500m, with a series of optional upgrades extending this to 1000m, 2000m or 3000m. The Shark G4R can be equipped with a 7-function and a 5-function manipulator. (Customizable)



OBS | SUR | INS | VC&L | A&T | NDT | WT | VSK

SAAB SEAEDGE

WWW.SaabSeaeye.com | James Douglas | solutions@saabseaeye.com



SEAEDGE COUGAR-XT COMPACT

The Cougar XT Compact, is the shallow water version of the Cougar XT. An extremely powerful vehicle, it is ideal for inspection applications where strong tidal currents are experienced. The smaller chassis significantly reduces drag which, in combination with a high-performance thruster arrangement and a small diameter tether, offers unrivalled performance for its size. (Customizable)



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SEAEDGE COUGAR-XTI

The Cougar XTi is 3000m rated and features Saab Seaeye's iCON™ intelligence control system. The proven capabilities of the Cougar XT combined with the use of iCON™ and a high frequency, high voltage, power supply system make the Cougar XTi a formidable 3000m observation vehicle with significant work capabilities. (Customizable)



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SEAEDGE EWROV

The latest addition to Saab Seaeye's underwater portfolio, the eWROV is a full-sized Class III B ROV system. Electrification is the key to improved performance, and the eWROV takes electric underwater vehicle capabilities to the next level. (Customizable)



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SAAB SEAEDGE

WWW.SAABSEAEDGE.COM | James Douglas | solutions@saabseaeye.com



SEAEDGE LEOPARD

The Leopard is an exceptionally powerful compact electric work class vehicle with a minimal 20ft x 8ft LARS footprint. It is fitted with up to 11 thrusters to provide a forward thrust of over 500kgf, has a 200kg payload and is controlled by Saab Seaeye's iCON™ intelligent control system. (Customizable)



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SEAEDGE PANTHER-XT PLUS

The high current shallow water survey and light work vehicle, the Panther XT Plus is a 1000m depth rated vehicle fitted with ten 500 Volt DC thrusters, providing it with exceptional handling and speeds of up to four knots. It is ideal for tasks that include drill support, pipeline survey, IRM and salvage. (Customizable)



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SEATOOLS

WWW.SEATOOLS.COM

Sales | sales@seatoools.com



ROHP II - INSPECTION ROV

The ROHP II, developed on behalf of Rijkswaterstaat, is a multipurpose inspection ROV designed for inspection, sampling, survey, and light intervention tasks in waters with strong currents and poor visibility, such as the North Sea. Because the ROV should be able to perform a wide variety of tasks, Seatechs developed two different modes: the hanging mode and the free-flying mode. As this was never done before, the project posed a significant challenge to our engineers. (Customizable)



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SEATOOLS

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ROCKPIPER - FALL PIPE ROV

Significant operational efficiency gains thanks to revolutionary integrated survey rov technology. Our client Boskalis approached Seatechs with a proposition to integrate a survey ROV into their main fall pipe ROV in order to eliminate the need for separate post-process surveys. The result is a highly automated fall pipe ROV that integrates a survey ROV. The survey ROV features full DP functionalities, and can dock and undock fully automatically so as to facilitate direct post-process surveys that yield major cost savings. (Customizable)



SUR | INS | CON | INT

ROV 7 - FALL PIPE ROV

A state-of-the-art fall pipe rov that achieves extremely reliable rock installation operations. The ROV 7 fall pipe ROV, which was built for Van Oord, integrates all of Seatechs' knowledge and capabilities in the field of fall pipe ROVs, and represents the state of the art in the field of ROV engineering. The conceptual design process recognized ROV reliability and availability as key requirements. Seatechs performed an FMEA study, and designed an ROV architecture that facilitates very high levels of system reliability. (Customizable)



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SMD

WWW.SMD.CO.UK

John McCann | john.mccann@smd.sg



ATOM

Atom is an ultra-compact work class ROV comparable in size to a large electric ROV. The vehicle is suitable for renewable applications, drill support, survey and light construction duties and can be mobilised on vessels and rigs with limited deck space. Atom's high power to size ratio makes it an effective performer in high currents. (Customizable)



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SMD

WWW.SMD.CO.UK | John Mccann | john.mccann@smd.sg



FLO

SMD have developed Flo, a survey and inspection ROV optimised for high speed survey and high current operations. SMD understand the challenges operators face when conducting ROV survey, inspection and maintenance work. These challenges are often in relation to reduced operating windows, high currents and the time it takes to do a task. All have the potential to add cost and risk to a project.



SUR | INS



QUANTUM

Quantum has class leading payload, thrust and tooling power figures. It is designed primarily for heavy construction and salvage work but can also be used as an effective survey platform. Space within Quantum's frame for mounting tools and instruments is exceptional. This flexibility means better in-water performance and current holding capabilities when measured against rivals that need to use a skid. (Customizable)



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QUASAR

The Quasar is the medium size vehicle in SMD's Q Series work class ROV range. Utilising the latest multi-platform Curvetech™ components, the vehicle offers class-leading in-current performance, tooling and instrument space and access for maintenance. Quasar is an excellent all round performer capable of survey, construction and drill support operations. (Customizable)



SUBMERSIBLE SYSTEMS INC.

WWW.SSIROVS.COM

Wolfgang Burnside | wolfgang@ssirovs.com



TRV-HD

The TRV-HD Extreme is a serious, compact Workclass vehicle with a very small footprint. When offshore real estate is at a premium the TRV-HD is the only logical choice. Most Manipulator options are available.



TECHNIPFMC ROBOTICS

WWW.TECHNIPFMC.COM | Hamish Stewart | hamish.stewart@technipfmc.com



ROBOTICS HD ROV

The 150hp HD ROV is an advanced modular design with a 60-minute maintenance philosophy, tooling integration and high-integrity hydraulic system. Standard features include flight automation systems including StationKeep, Auto Track and Auto Displacement, in addition HD Ethernet Video, Auto follow manipulator camera, rapid repair systems and onboard diagnostics are features to aid productivity of the vehicle, pilot and overall operation. (Customizable)



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TECHNIPFMC ROBOTICS

WWW.TECHNIPFMC.COM | Hamish Stewart | hamish.stewart@technipfmc.com



ROBOTICS GEMINI® ROV

The GEMINI® ROV System is an advanced WROV providing unprecedented productivity and reliability for the most complex deepwater intervention tasks. GEMINI® is equipped with dual next-generation manipulators enabling the ROV to exchange tools subsea and a fluid pumping and storage system enabling the ROV to remain at depth to complete numerous tasks without the need to recover the ROV to surface. Equipped with digital video suite and the latest StationKeep™ V2 the ROV can perform high-precision intervention tasks without the need to anchor and stabilize the ROV to a subsea asset. (Customizable)



CON | INT| VC&L | A&T | NDT | VSK



ROBOTICS UHD-II ROV

The UHD-II vehicle delivers market leading performance for the most arduous deepwater construction tasks, and offers enhanced flexibility for survey and IRM applications. (Customizable)



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NDT VSK



ROBOTICS UHD-III ROV

The 250hp UHD-III ROV features a software controlled auxiliary pump capable of delivering dual fluids/types at various pressures/outputs. Modular design enables the UHD-III to carry 100 US Gals inboard negating the requirement for fluid intervention skids to support construction and drill support activities. Standard features include flight automation, HD Ethernet Video, rapid repair systems and onboard diagnostic to aid productivity of the vehicle, pilot and overall operation. (Customizable)



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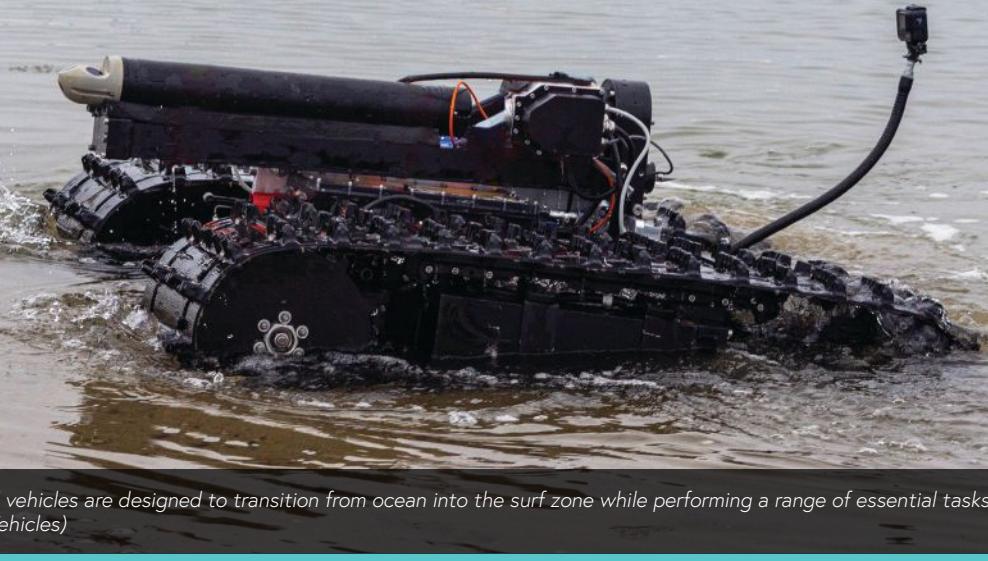
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» Bayonet's amphibious tracked vehicles are designed to transition from ocean into the surf zone while performing a range of essential tasks.
(Photo credit: Bayonet Ocean Vehicles)

A NEW CLASS OF AMPHIBIOUS VEHICLE HAS LANDED

Headquartered in Richmond, Vermont with operations based in Plymouth, Massachusetts USA, Bayonet Ocean Vehicles manufactures a series of amphibious tracked vehicles that can perform numerous tasks including transitioning from deep ocean into the surf zone and onto the beach, making them a powerful tool for operators working in multiple marine environments.



» The crawlers can be fitted with a variety of environmental, oceanographic, hydrographic, benthic and industry specific sensors to support coastal survey.
(Photo credit: Bayonet Ocean Vehicles)

Deployable from land or water, independent of weather, the new Bayonet crawlers have been designed to transit along the ocean floor as well as on land, making them the only robotic platform in the world capable of working the surf zone, at ocean depths of up to 100 meters, and all the way up the beach.

THE BAYONET LINEUP

Bayonet Ocean Vehicles offers three vehicle sizes, the Bayonet 150, 250 and 350. Customers are able to scale the vehicle size, configuration and power to meet the demands of the payload, operation duration, and environment.

The Bayonet 150 is a two-person portable vehicle for non-heavy weather, small boat deployment and smaller payloads. Standard dimensions are 33 x 20 x 10 inches with a deployment weight—with batteries—of 125lbs. The unit has a dry range of 22 miles, 10 miles for wet operations.

The Bayonet 250 also offers two-person portability and tool-free assembly in the field. With a deck capacity of 250lbs, it is designed to resist heavier weather and support more substantial payloads. Standard dimensions are 48 x 52 x 14 inches.

The Bayonet 350 is the largest model of the portfolio, capable of handling the harshest conditions and the heavier payloads, with a deck capacity (dry) of 350lbs. Standard dimensions are 5 x 6 x 1 ft, weighing in at 600 lbs. Capable of speeds of 1.8 km/p/h, the unit is depth rated to 100 meters.

Each model is available in a heavy duty configuration which supports heavier payloads with more torque.

STABLE & ADAPTABLE

All three models of amphibious crawler are built on OPENSEA from Greensea Systems which provides the vehicles with the most stable and adaptable operating system in marine

robotics. This collaboration gives a Bayonet vehicle owner access to important capabilities such as precise navigation, vehicle autonomy, remote operation, component, and payload integration not currently offered by anyone else in the tracked vehicle market.

The crawlers can easily work in the surf zone, carrying larger sensor payloads on the seafloor, and can be fitted with a variety of environmental, oceanographic, hydrographic, benthic and industry specific sensors to accommodate numerous commercial and military applications.

These can include hydrographic survey, wind farm survey and maintenance, littoral warfare such as mine detection and clearance, coastal dredging support, environmental monitoring of the seafloor, beach zone, rivers and marshes, and wharf inspections.

For more information, visit: www.bayonetoceanc.com.

TOWED & BOTTOM CRAWLING VEHICLES

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TOWED & BOTTOM CRAWLING VEHICLES

ALERON GROUP

WWW.ALERON-GROUP.COM
info@aleron-group.com



TRACK ROV

The TRACKROV system is designed to deploy and operate the Pangeo Sub Bottom Imaging system. It can also be equipped with large dredge pumps and a suite of survey sensors such as imaging sonars, magnetometers, cameras, lights and manipulators to perform closer inspections of potential targets during the survey. The system can be either deployed with the vessel crane or via a small independent marine crane. (Customizable)



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BAYONET OCEAN VEHICLES

WWW.BAYONETOCEAN.COM | Nick Hartman | sales@bayonetcean.com



BAYONET 150

125lb autonomous crawling robot for a range of environmental, commercial and military tasks in nearshore, estuarine and inland locations. Two person portable vehicle for non heavy weather, small boat deployment and smaller payloads. Dimensions: 33 x 20 x 10 inches. Standard Open Deck Space: 24 x 6 inches. Weight (with batteries): 125 lbs Duration Dry / Wet: 22 / 10 miles. Deck Capacity: 350 lbs. Ground Pressure – Dry / Wet: 0.15 / 0.08 psi



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BAYONET OCEAN VEHICLES

WWW.BAYONETOCEAN.COM
Nick Hartman | sales@bayonetcean.com



BAYONET 250

Medium payload autonomous crawling robot for a range of environmental, commercial and military tasks in nearshore, estuarine and inland locations. Tool free in field assembly for two person portability and design allows heavier weather and larger payloads. Standard Dimension: 48 x 52 x 14 inches. Heavy Duty Dimension: 60 x 60 x 16 inches. Weight (with batteries): 250 lbs. Duration Dry / Wet: 24 / 10 miles. Deck Capacity: 850 lbs (max component 75 lbs). Drawbar Pull: 800 lbs. (Customizable)



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BAYONET 350

High payload, modular autonomous crawling robot performs a vast range of tasks in beach, surf or deep-water conditions. Capable of handling the harshest conditions and largest payloads. Dimensions: 5 x 6 x 1 ft (1.5 x 1.8 x 0.3m). Weight: 600 lbs (272kg). Modular, fits in subaru. Weight (with batteries): 125 lbs. Depth: 109 yards (100m). Speed: 1.8km/hr. Deck capacity – dry: 1102 lbs (500kg). (Customizable)



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BELLAMARE, LLC

WWW.BELLAMARE-US.COM

info@bellamare-us.com



REMOTELY OPERATED TOWED VEHICLES - ROTVS

Passive sleds are best suited for deeper applications, and when depth of operation is controlled by how much cable is paid in and out. Active sleds are fitted with dive wings and/or elevons that the operator can control from the ship. They are used when the applications call for frequent undulations or altitude keeping, etc. (Customizable)



DEEP TREKKER INC.

WWW.DEEPTREKKER.COM | Sales | sales@deeptrekker.com

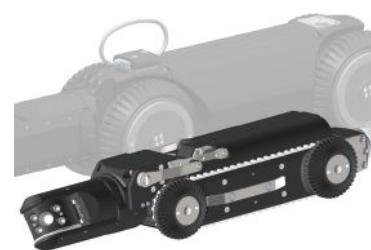


CCTV PIPE CRAWLERS

Pipeline inspections have never been easier to conduct. Say goodbye to a dedicated truck and hello to a reliable and robust system. Pilot through wet or dry pipes using the hand-held controller and don't worry about using a generator, as our pipe crawlers are completely battery operated. (Customizable)



OBS | VC&L



DT320 MINI PIPE CRAWLER

Meet the battery powered mini pipe crawler inspection system. This mini CCTV sewer inspection camera is capable of inspecting 6-inch lined pipes (152 mm) and even undersized 6-inch diameters. It is constructed with the same design as the larger DT340; rugged stainless steel aluminum body, durable sapphire glass lens cover and clear HD pan/tilt camera. (Customizable)



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WT WORK TOOLS

DEEP TREKKER INC.

WWW.DEEPTREKKER.COM | Sales | sales@deeptrekker.com



PIPE TREKKER

Utilizing design principles from building underwater robotics, our pipe crawlers are built to last, so you have less downtime with crawlers in the shop and more time in the field. Pipe Trekker crawlers are also extremely intuitive, so your operators need less training to be able to deploy it and various crews, whether it is the pipe cleaning, lining, or televising crews, can operate the crawler instead of relying a dedicated TV truck crew for all inspections. (Customizable)



OBS | VC&L | A&T | VSK



DT640 MAG MAGNETIC CRAWLER

The DT640 MAG Crawler is the most versatile inspection vehicle of its kind. The sleek, three-wheel submersible comes with a magnetic option, creating the ideal vehicle for an array of underwater work. Compact for transportation and extremely portable, our Utility Crawlers have been designed to launch immediately for any location, and with the efficiency of internal batteries, they can provide up to 8 hours of work in a single 1.5 hour charge. Work underwater up to 50m (164ft), all with live video streaming to the surface. The Utility Crawler is your go-to tool for a multitude of remote inspections, with application-specific add-ons for pressure washing, vacuuming, thickness testing, and more both above and below the water. (Customizable)



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TOWED & BOTTOM CRAWLING VEHICLES

ECA GROUP

WWW.ECAGROUP.COM | Anthony Penn | sales@ecagroup.com



CEP75

Multidirectional remotely operated electric crawler for operations inside pipes or pools. Watertight up to 20 m, it can transport a 75 kg payload. Its modular design allows embarking up to 3 TV cameras, and a mini electric manipulator arm.



PIPE CRUISER

Designed for inspection in any type of pipes (diameter 150 to 2000 mm, up to 500 m length), this multidirectional modular system avoids obstacles, turns in curves, swivels and moves back to deliver real-time exceptional quality videos and measurements. Watertight up to 10 m.



ROVING BAT

Hybrid ROV and crawler, Roving Bat can swim as a ROV and, thanks to 4 vertical thrusters, it tilts, rolls and sticks well onto vertical surfaces, such as ship hulls. Then it crawls along to perform inspection, cleaning operations and NDT measurements. Roving Bat is the optimal solution for UWILD applications.



T18-M

T18-M is a self-powered towed interferometric synthetic aperture sonar (SAS) for Real Time Detection, Classification and Mapping (SCM) of seabed and moored mines. It is equipped with a thinner umbilical cable and a lighter equipment for easier deployment from a USV or another platform. The T18-M is specifically designed to meet all recommendations related to mine warfare operations (particularly the detection or classification phases).



TOWSCA

With a 30 year-long experience in towed sonars (DUBM 41 & 42, MJ 2000, ...), ECA Group proposes a range of towed sonars (Side Scan Sonars & Synthetic Aperture Sonars) designed to be automatically deployed and retrieved by USVs. Towsca is one of them.



EDGETECH

WWW.EDGEtech.COM | Sales | info@edgetech.com



EDGETECH 2050

The EdgeTech 2050-DSS is the latest product to combine EdgeTech's highly successful line of side scan sonars and sub-bottom profilers into one fully integrated system. This is especially useful where high resolution sub-bottom profiler data, that requires the system to be towed near the seabed, is required.



EDGETECH 2400

EdgeTech's 2400 Series is a fully integrated combined side scan sonar (with optional wide swath MPES bathymetry) & sub-bottom profiling system designed for deep water operation in depths up to 6,000m. The 2400 can be completely configured by the user to best suit the applications at hand. The system comes with a dual simultaneous frequency side scan sonar with a choice of 75 kHz, 120 kHz or 410 kHz frequencies; any of which can be paired together. The 2400 also comes with the choice of a wideband sub-bottom profiler. Frequency options for the sub-bottom profiler are 1-10 kHz, 2-16 kHz or 4-24 kHz.



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EDGETECH 3400

EdgeTech 3400 provides users many enhancements to current sub-bottom profiler systems. The 3400 is a wideband Frequency Modulated (FM) sub-bottom profiler utilizing EdgeTech's proprietary Full Spectrum CHIRP technology. The system generates high resolution images of the sub-bottom stratigraphy in oceans, lakes, and rivers and provides excellent penetration in various bottom types. The EdgeTech 3400 comes in a dual 2-16 kHz transducer configuration. The EdgeTech 3400 Sub-bottom Profiling System comes as a complete package and includes a towfish, cable and a topside processor running EdgeTech's DISCOVER sub-bottom acquisition & processing software.



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EDGETECH 2300

EDGETECH 2300 COMBINED SIDE SCAN SONAR & SUB-BOTTOM PROFILER- This deep-water system integrates the highly successful line of side scan sonars, sub-bottom profilers and (optional) MPES bathymetry into one fully integrated 2,000 meter rated system.



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EDGETECH 4125I

EdgeTech's 4125i Side Scan Sonar System was designed with both the Search & Recovery (SAR) and shallow water survey communities in mind. The 4125i utilizes EdgeTech's Full Spectrum® CHIRP technology, which provides higher resolution imagery at ranges up to 50% greater than non CHIRP systems operating at the same frequency. This translates into more accurate results and faster surveys, thus cutting down on costs. Two dual simultaneous frequency sets are available for the 4125i depending on the application. The 400/900 kHz set is the perfect tool for shallow water survey applications, providing an ideal combination of range and resolution. The 600/1600 kHz set is ideally suited for customers that require ultra high resolution imagery in order to detect very small targets (SAR).



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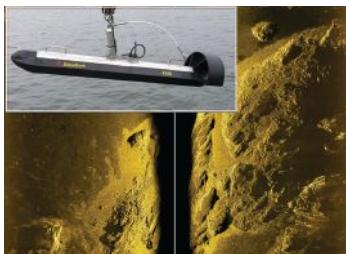
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TOWED & BOTTOM CRAWLING VEHICLES

EDGETECH

WWW.EDGEtech.COM | Sales | info@edgeTech.com



EDGEtech 4205

The next generation 4205 is a versatile side scan sonar system that can be configured for almost any survey application from shallow to deep water operations. The 4205 utilizes EdgeTech's Full Spectrum® CHIRP technology to provide crisp, high resolution imagery at ranges up to 50% greater than non-CHIRP systems; thus allowing customers to cover larger areas and save money spent on costly surveys. In addition to the high-resolution imagery that EdgeTech is known for, the 4205 comes with a number of new features which makes the system even more flexible and powerful in offshore operations.



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EDGEtech 6205

The 6205, a Multi Phase Echo Sounder (MPES) produces real-time, high resolution, three dimensional (3D) maps of the seafloor while providing co-registered simultaneous dual frequency side scan imagery. Utilizing EdgeTech's Full Spectrum® technology, the 6205 exceeds IHO SP-44, NOAA and USACE specifications for feature detection and bathymetric point data uncertainty. Near shore and shallow water hydrographic surveys are completed faster and safer utilizing the 6205 due to the wide swath (over 200° view angle).



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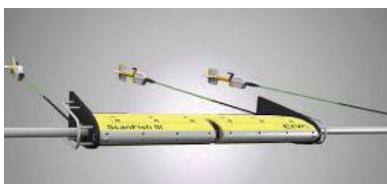
EDGEtech 6205s2

The EdgeTech 6205s2 is our 4th generation fully integrated Wide Swath Bathymetry and Dual Frequency Side Scan Sonar System that produces real time, high resolution, side scan imagery and three-dimensional maps of the seafloor. The 6205s2 overcomes the limitations of Multi Beam Echo Sounders (MBES) and Interferometric (Phase Differencing) systems in shallow water by using EdgeTech's unique Multi-Phase Echo Sounder (MPES) technology.



EIVA A/S

WWW.EIVA.COM | Eiva Sales Department | eiva@eiva.com



SCANFISH KATRIA

The ScanFish Katria is an intelligent wide-sweep Remotely Operated Towed Vehicle (ROTV) solution for time-efficient magnetometer surveys. As it comes with high-sensitivity magnetometers for maximum target detection efficiency, it is an effective tool for detection of sub-bottom magnetic anomalies. (Customizable)



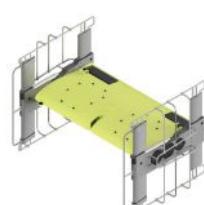
SCANFISH ROCIO

The ScanFish Rocio is a multi-purpose ROTV solution covering a wide variety of oceanographic survey disciplines. Its high payload allows you to fit several different pieces of equipment. This versatile platform will meet your specific needs and streamline your survey operations by combining all survey tasks in one flexible solution. (Customizable)



SCANFISH TROPHEUS

The ScanFish Tropheus is an ROTV especially designed for UXO detection that eliminates data uncertainty with high-quality seabed imaging. It functions as depressor of any side-scan sonar and is the optimum solution in terms of quality, efficiency and safety. (Customizable)



SCANFISH XL

ScanFish XL is the largest and latest addition to EIVA's family of ScanFish remotely operated towed vehicles (ROTVs). Designed to host a payload of up to 400 kg, ScanFish XL offers freedom from sensor and instrumentation limitations of a typical ROTV, enabling comprehensive multi-instrument data collection with every runline. (Customizable)



FORUM SUBSEA TECHNOLOGIES

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PERRY XT300



PERRY XT500



PERRY XT600



XT1200/1500

The Perry® XT range of trencher vehicles are designed to meet the demanding trenching requirements of both strong soils and deep flowline burial protection over long stretches. Capable of operating in free-fly, skid-based trenching and survey modes, these vehicles represent extremely capable, high-performance product burial solutions.



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TOWED & BOTTOM CRAWLING VEHICLES

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ISE AURORA SONAR TOWFISH

The Aurora Towfish is actively stabilized using 4 independently actuating aft planes and actuated main wing capable of generating up to 50kN of downforce. It collects high resolution data at up to 12 knots, with faired or unfaired cables, down to depths of 200m while navigating in either depth or terrain follow mode. The Aurora Towfish can carry full size AUV payloads including SSS, SAS, MBES, etc., shown here with Klein 5900 and R2Sonic 2024. (Customizable)



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JW FISHERS MFG.

WWW.JWFISHERS.COM

Brian Fisher | info@jwfishers.com



SBP-1 SUB BOTTOM PROFILER

Fishers SBP-1 is an economical sub bottom profiler that shows the strata layers beneath the ocean floor as well as objects buried in the bottom.



KRAKEN SONAR SYSTEMS INC.

WWW.KRAKENROBOTICS.COM

Shauna Cotie | scotie@krakenrobotics.com



KATFISH™

KATFISH™ is an intelligent towed SAS system. This product acquires over 3 billion pixels per 3km² per hour of area coverage rate. That's 30 times more detail than conventional side scan sonar. Advanced algorithms perform thousands of adjustments per second to ensure every pixel displays data with incredible clarity. (Customizable)



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MACARTNEY

WWW.MACARTNEY.COM

Lars Jørgensen | lj@macartney.com



FOCUS 2

Based on the original and successful FOCUS, the FOCUS 2 system operates in depths of up to 400m at speeds of up to 10kn with fully pre-programmable horizontal and vertical movement. The high speed, capacity and stability of FOCUS 2 enable operators to increase productivity while decreasing total project costs. (Customizable)



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MACARTNEY

WWW.MACARTNEY.COM | Lars Jørgensen | lj@macartney.com



FOCUS 3

FOCUS 3 represents the third generation FOCUS vehicles in the family of ROTV systems by MacArtney. The FOCUS 3 vehicle is constructed using carbon fibre technology for the wing sections, whereas the instrumentation pods are made from anodised aluminium, allowing for operations at depths of up to 1000m. (Customizable)



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MACARTNEY

WWW.MACARTNEY.COM

Lars Jørgensen | l@macartney.com



TRIAXUS

TRIAXUS is developed for highly efficient oceanographic data acquisition. TRIAXUS is able to operate at 1-350m operational envelope, speeds of up to 10kn and at vertical velocities of up to 1m/s. TRIAXUS features a strong, light-weight hydrodynamic carbon fibre hull boasting a powerful control system and a high payload capacity. (Customizable)



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QINETIQ NORTH AMERICA

WWW.QINETIQ-NA.COM | Ken Heller | Ken.heller@qinetiq-na.com



C-TALON

Underwater derivative of the US Military fielded TALON platform. This platform is geared towards research and exploration users who are looking for an Underwater Crawler to operate in the Surf Zone, Riverine Environments or Limited-Access Harbor Areas. The platform is designed specifically for customization and tuned to customer specific needs.



MARISCOPE MEERESTECHNIK

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Niklas Becker | n.becker@mariscope.de



MINI OBSERVER/OBSERVER III

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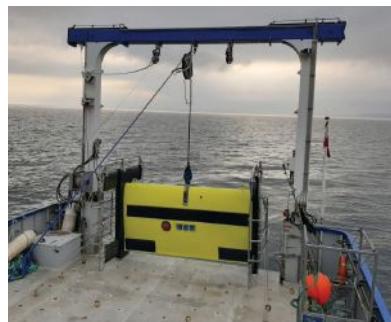


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SEAROBOTICS CORPORATION

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Sales | info@searobotics.com



SABRETOOTH

SabreTooth is a submersible, magnetic, hull crawling robot used for a wide range of shipboard inspection and maintenance tasks. Its robust and flexible design makes SabreTooth capable of handling critical and often dangerous surveillance and reconnaissance operations - all while keeping personnel out of harms way. This hull-crawler robot features high-quality sonar imaging sensors used to inspect and identify potential threats.



HULLBUG

Semi-autonomous hull grooming system that deploys a series of integrated sensors and magnetic drive wheels to navigate a ship's hull and disrupt the early presence of biofouling. Light brushes gently detach accumulated biofouling while a submersible suction pump removes and captures it altogether, resulting in fuel efficiency gains and cleaner waters.



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TOWED & BOTTOM CRAWLING VEHICLES

SEAROBOTICS CORPORATION

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TANKBUG

Underwater tank cleaning system that removes divers from dangerous situations by inspecting, cleaning, and removing heavy or dense sediment from water tanks. This detailed inspection also identifies any hidden corrosion or structural compromise, helping operators to safeguard against individual risk and costly maintenance or repairs.



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SMD

WWW.SMD.CO.UK | Rob Eddon | rob.eddon@smd.co.uk



BFP - BACKFILL PLOUGH

The backfill plough (BP) is designed for compatibility with the VMP trenching plough to cover rigid pipes or flexible umbilicals in the oil and gas industry. SMD has supplied pipeline ploughs for over 35 years to various customers and projects. The BP incorporates design features to allow it to operate on very soft soils without significant sinkage including large support skids and minimum weight. (Customizable)



CBT1100

Provides a soft to hard ground burial solution in one neat package. Fully amphibious 800kW vehicle. Equipped with a powerful chain cutter, dredge pump and jet legs. A well proven chain cutter deployment system allows post lay burial of cable up to 300mm and 4.0m MBR. (Customizable)



CBT2100

Draws on SMD's experience of track driven vehicles, trenching and cable handling subsea to provide a soft to hard ground burial solution. A fully amphibious vehicle equipped with interchangeable tooling cassettes including powerful chain cutter, dredge pump and jet legs. (Customizable)



CBT3200

Provides a soft or hard ground burial solution in one neat package. Also available as a burial tractor configured for pipeline burial. Equipped with a selection of powerful chain cutter trenching tools, dredge pumps and jet legs. Well proven chain cutter deployment systems allow pre or post-lay burial of cables up to 300mm diameter and 5.0m MBR, and pipelines up to 1.5m diameter. (Customizable)



HD3 - 200

Based on proven SMD plough technology, the HD3-200 inter array plough provides a high performance trenching solution for large diameter power cables up to 200mm. Using patented technology, the plough is designed to minimise pull force requirements and provide effective trenching capability up to 2.4m depth. The diverless loading and unloading system allows post lay burial in deepwater.



HD3 - 300

Based on the proven SMD plough technology, the HD3-300 flexibles plough provides a high performance trenching solution for large diameter flexible umbilicals and power cables. Using patented technology, the plough is designed to minimise pull force requirements and provide effective trenching capability up to 3.3m depth and up to 3.0m of cover. The diverless loading system also allows post lay burial in deepwater.



**MD3 - 160**

A high-performance trenching solution for large diameter flexible umbilicals. Using patented technology the plough is designed to minimise pull force requirements and provide effective trenching capability up to 3.0m depth. Coupled with a tow winch, umbilical and LARS SMD are able to supply a turnkey flexible solution.

**PLP - PRE-LAY PLOUGH**

The newest addition to SMD's plough range is the multi-function pre-lay plough offered in a number of configurations for boulder clearing, trenching and/or backfill. Available with a 150Te and 200Te tow load, this one plough can be set up to carry out any combination of these processes making it economical in both cost and time, minimising lay risk and maximising lay speed. (Customizable)

**QTRENCHER 400**

Uses high voltage supply to provide effective cable maintenance and other specialised tasks. Purpose designed to provide maximum jetting and thrust performance. Has reputation for reliability and ease of maintenance & has become an essential part of any cable installation vehicle suite. Turnkey cable maintenance solution including LARS and umbilical. (Customizable)

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QTRENCHER 500

The Q-Trencher 500 ROV provides high power trenching capability for the burial of cables up to 3m deep. The ROV uses variable high flow or high pressure jetting to optimise the trenching to suit the conditions. It can also deploy a rear eductor to enhance burial of large diameter product. Using a forward jet tool it can manoeuvre to bury tight loops. Its high thrust enables rapid post lay survey. It can also be fitted with a suite of tools for maintenance operations. SMD offer a turnkey, integrated solution including SMD designed high sea state LARS and umbilical system. (Customizable)



QTRENCHER 600

Uses high voltage supply to provide effective cable maintenance with other specialised tasks. Purpose designed for maximum jetting and thrust performance. Optimised with a single 4.1kV hydraulic power unit to achieve 600hp in a compact package. Turnkey solution including SMD designed high sea state LARS and umbilical. (Customizable)



QTRENCHER 800

Using variable high flow or high pressure jetting, the QTrencher 800 can optimise trenching in a number of soil conditions. In addition it can also deploy a rear educator or backwash sword to enhance burial of large diameter products and provides high thrust enabling rapid post lay survey. (Customizable)



QTRENCHER 1000

Provides high power trenching capability for the burial of cables, umbilical and small diameter pipes up to 3m deep. Uses variable high flow or high-pressure jetting to optimize the trenching to suit the conditions. Can also deploy a rear eductor to enhance burial of large diameter product. With its high thrust, the ROV can perform rapid post lay survey. Can also be fitted with a suite of tools for maintenance operations. (Customizable)



QTRENCHER 1400

High powered free-swimming jet trencher. Optional track drive for enhanced burial capability. Optional tracked skids for bespoke tool deployment. More than 1.0 megawatt of total power. Delivers 0.75 megawatts of variable high pressure jetting power for trenching and up to 200kw of low pressure water jetting for trench backwash, eduction or trench collapse. (Customizable)



QTRENCHER 1600

The Q-Trencher 1600 is a high powered free-swimming jet trencher, with optional track drive for enhanced burial capability and optional tracked skids for bespoke tool deployment. With 1.2MW of total power, the trencher delivers 800kW of variable high pressure jetting power for trenching and up to 300kW of LP water jetting for trench backwash, eduction or trench collapse. (Customizable)



SMD

WWW.SMD.CO.UK | Rob Eddon | rob.eddon@smd.co.uk



QTRENCHER 2800

The 60Te QTrencher (QT) 2800 remotely operated vehicle (ROV) is the world's most powerful free-swimming jet trencher. With more than 2 megawatts of total power, the trencher delivers 1.5 megawatts of jetting power. The complete system spread sets a new standard in severe weather deployment and operation. (Customizable)



SD2 160

SMD's standard plough is a lightweight, lower cost, high quality option for cable ploughing for use in most soils. It has the added benefit of a secondary share for effective repeater burial. The standard plough can create a trench up to 1.5 metres deep in water depths up to 2000 metres. (Customizable)



VMP - VARIABLE MULTIPASS PLOUGH

Building on SMD's reputation for the continuous development of plough technology, the Variable Multipass Plough range introduces further improvements and optimisation of the well proven SMD multipass pipe plough. These models offer enhanced variable multipass capability, allowing the operator to remotely adjust the depth during trenching.



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Ian McMillan | ian.mcmillan@subcimaing.com



TOW CAMERA SYSTEM

Durable, high-performance system to capture and store underwater observations in 4K & HD. Reliable alternative to expensive AUV and ROV deployments. Collect thousands of high-quality seafloor images, hours of video, and data. Includes 410m of kevlar tow cable, real-time video feed, LEDs, and lasers for precision and superior footage.



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SUBSEA TECH

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ASPIROV

AspiROV is an ultra-portable robot especially designed for visual inspection and cleaning of fire fighting, industrial and potable water tanks. Based on the Guardian mini-ROV design, it can be operated in inspection mode (navigation in open water) or in cleaning mode thanks to its rolling skid. (Customizable)



INT

TELEDYNE SEABOTIX

WWW.TELEDYNEMARINE.COM

Jamie Carrig | jamie.carrig@teledyne.com



VLBC - VECTORED LITTLE BENTHIC CRAWLER

Unmatched in versatility, the SeaBotix vlBC is a revolutionary approach to ship hull and infrastructure inspection for a wide range of military and commercial applications. With no magnets or thrusters (churning the water, impeding visibility), SeaBotix Crawlers employ the patented Vortex Generator to attach to any relatively flat, hard surface with up to 22+ kgf (48 lbf) of attraction force. With no relative motion between the inspection surface and the sensors, output data is the highest quality possible and operator fatigue is greatly reduced. (Customizable)



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SEASAFE SUBSEA BATTERIES

SWE SeaSafe batteries allow subsea vehicles, subsea oil and gas IMMR, and more to go deeper with longer operating endurance.

THE CASE

A family of subsea battery modules, that are easy-to-configure and use, were pioneered, researched, and developed by SouthWest Electronic Energy (an Ultralife company). The Texas-based battery manufacturer, commonly called SWE, created these lithium-ion polymer battery modules—known as SWE SeaSafe®—to offer improvements in safety, reliability, and size flexibility.

There are two variations of the battery to serve different customer use case needs: the first are contained in oil-filled pressure equalized enclosures (SeaSafe® II) and the second can be placed direct-in-water (SeaSafe® Direct). Both incorporate a patented battery management system (BMS) that allows subsea vehicles, subsea oil and gas IMMR or production systems to go deeper, operate for longer, benefit from increased endurance and reliability, and achieve more advanced subsea missions at greater depths with the utmost efficiency.

THE COMPANY

Since 1964, Southwest Electronic Energy (SWE) has been a leader in innovative battery solutions, serving the specific needs of original equipment manufacturers. SWE serve a broad industrial

customer base including subsea, oceanographic, oilfield services and pipeline inspection. In 2019, SWE was acquired by Ultralife Corporation, expanding its global capabilities and market reach into the military and medical arenas.

What has not changed is SWE's focus on developing long lasting customer relationships and delivering high standards of service, quality and reliability. SWE's facility in Houston, Texas is one of seven Ultralife locations worldwide to boast both ISO 9001:2015 and ISO 13485 quality certifications. Over 300 customers benefit from top quality direct ship-to-stock programs.

THE TECH

SWE's SeaSafe® lithium-ion battery solutions were developed to meet the needs of Woods Hole Oceanographic Institution (WHOI) and other subsea equipment and vehicle innovators. Now, subsea vehicles, control systems, and oceanographic equipment can be powered safer and longer with 4X the energy of a sealed lead acid (SLA) battery. Pressure tolerant to 6,000-meter depth; both SeaSafe® II and SeaSafe® Direct batteries include SWE's patented battery management system (the SeaSafe® BMS).

The BMS has the brainpower to assure safe operation, protect

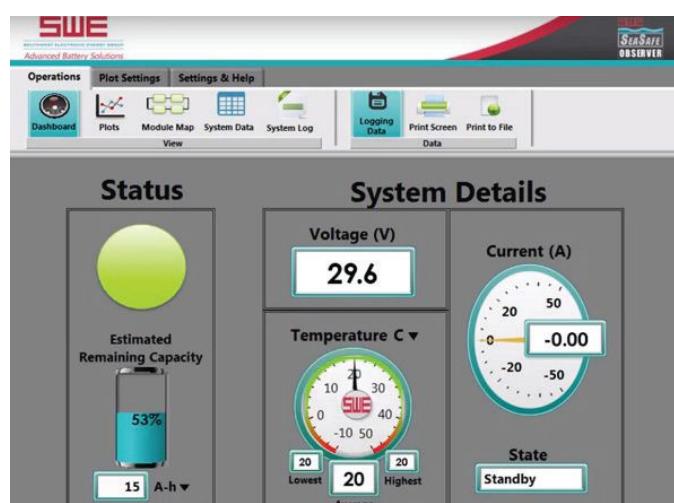
the module's cells from damage, allow reliable distributed battery system architecture, and prolong battery life. Rechargeable with a standard CC/CV DC power supply, SeaSafe® smart battery modules are easy-to-use battery building blocks for customers to integrate into their own battery system. Connecting modules in series increases battery system DC voltage, and in parallel increases battery system DC Power or Ah Capacity.

The new SeaSafe® Endurance offers a version that can provide even higher Ah capacity and lower cost when used within a cylindrical pressure vessel. Available in 37VDC, 30VDC, or 24VDC sizes, all SeaSafe® battery modules are RS485

Modbus software compatible and ID addressable to uniquely report run-time data on demand (including gas gauge, current, voltage, temperature and state-of-health data).

SeaSafe® Observer software can be used to easily monitor SeaSafe® battery systems with a Windows PC. Other SeaSafe® peripherals, such as the SeaSafe® battery charger, cables, and Diode ORing modules can be provided to make battery system configuration and operation easy and reliable. SeaSafe® batteries are American Bureau of Shipping (ABS) certified.

For more information, visit: <https://www.swe.com/seasafe>.



» SeaSafe® Observer software is MS Windows compatible and allows users to monitor battery performance. (Photo credit: SWE)

AUVs

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WEBSITE

3D AT DEPTHWWW.3DATDEPTH.COM

Sales | USASales@3datdepth.com

**CUVIER DEEP**

3D at Depth's containerized, fully integrated ROV Subsea Vehicle Inspection and Survey Solution designed to optimize mobilizations by transforming an open deck vessel to a survey and inspection platform in less than 18 hours. Deepwater assets and Offshore wind operators, owners and Energy providers can now reduce expenditures and risks while lowering offshore man-hours, decreasing carbon footprint without sacrificing quality by providing measurable and enhanced information.



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ADVANCED NAVIGATIONWWW.ADVANCEDNAVIGATION.COM | Sales | sales@advancednavigation.com**HYDRUS**

Hydrus takes the drone revolution underwater, with the most advanced navigation and communication systems of any subsea vehicle. It contains a DVL, USBL, INS, acoustic and optical modem, all tightly integrated. This enables highly reliable, fully autonomous underwater missions at your fingertips. It also provides obstacle detection and collision avoidance.



VC&L

ANDURILWWW.ANDURIL.COM | contact@anduril.com**DIVE-LD**

The DIVE-LD is tailor made for littoral and deep-water survey, inspection & ISR. It allows for rapid configurations to meet mission-specific needs, applicable to a wide range of defense and commercial mission sets. (Customizable)



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ATLAS ELEKTRONIKWWW.UK.ATLAS-ELEKTRONIK.COM | info@atlas-elektronik.com**SEACAT**

SeaCat is a hybrid AUV/Rov System with a FOC Link of 1000m. It can be supplemented by a multitude of sensors, located in a flooded bow section. The SwapHead - is exchangeable in the field within minutes and allows a wide range of high demanding missions that otherwise would require different types of vehicles.

**SEAFOX®**

This fibre-optic guided, one shot mine disposal vehicle is used for semi-autonomous disposal of naval mines and other ordnance found at sea. It is able to automatically relocate previously acquired positions of underwater objects within minutes with the integrated homing sonar. After relocating, these objects can be identified using the onboard CCTV camera and destroyed by the use of a built-in, large caliber shaped charge. The one-way concept significantly reduces the disposal time and extends the operational envelope.



BAE SYSTEMS

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Paco Santana | riptide@baesystems.com



MICRO-UUV

BAE Systems' Riptide family of autonomous undersea vehicles provide a sustainable and scalable platform to advance technology development and undersea operations. Our mission agnostic and modular system design enables easy modification, while multiple energy source options allow for maximum flexibility for endurance, safety, shipping, and mission optimization.



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CELLULA ROBOTICS LTD.

WWW.CELLULA.COM | info@cellula.com



IMOTUS

Imotus is a hovering autonomous underwater vehicle (HAUV) with six degrees of freedom for inspection & data acquisition missions in confined and open water environments. Imotus uses scanning sonars and proprietary SLAM algorithms to provide navigational control and spatially referenced survey data. (Customizable)



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BEDROCK OCEAN AUV

Bedrock has engineered a new generation of portable, autonomous underwater vehicles (AUVs), allowing us to acquire seafloor data more efficiently than traditional ship or surface-based methods. Our portable AUVs support missions in water depths less than 300m and/or 90km from shore. At a speed of 2-3 knots, our AUVs have a low chance of animal or environmental damage as they're transiting.



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BOSTON ENGINEERING

WWW.BOSTON-ENGINEERING.COM

Alex Wallace | info@boston-engineering.com



BIOSWIMMER UUV

The BIOSwimmer UUV applies the dynamics of biological fish to advance underwater search, inspection, and to operate in constricted areas inaccessible by other vehicles. The BIOSwimmer addresses maritime capability gaps in littoral waters by increasing data collection in confined areas and using multi-payload support to perform a breadth of missions. (Customizable)



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ECA GROUP

WWW.ECAGROUP.COM

Sales | sales.robots@ecagroup.com



A9 (A9-M / A9-E)

A man portable AUV for environmental monitoring and survey as well as surveillance for Defense and Security applications. This AUV is easy to deploy and operate from shore or any other platform. Dedicated data management software for civil and military missions are available.



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ECA GROUP

WWW.ECAGROUP.COM | Sales | sales.robots@ecagroup.com

**A18 (A18D / A18-E)**

Deep water modular and flexible mid-size autonomous underwater vehicle (AUV) for high resolution 3D survey. Thanks to its accurate navigation system and its SAS sonar, this AUV brings you the highest quality data. A dedicated Launch & Recovery System is available as well as a dedicated software suite for data management. ECA Group provides AUV Services based on A18D.

**A27 (A27-E / A27-M)**

Long endurance modular and flexible platform for high resolution 3D survey. A27-M with reduced acoustic signature for Mine Countermeasures (MCM) missions, A27-E for civil applications.

**ALISTAR 3000**

ALISTAR 3000 is the right solution for the challenging deepwater survey and inspection operations. This long endurance and highly efficient power solution Autonomous Underwater Vehicle, AUV, is a modular system capable of carrying out multiple accurate sensors. These provide operators greater flexibility and overall faster operations. Easy to deploy and operate from various ships make these AUV's ideal choices.

**EDGELAB SRL**

WWW.EDGEGLAB.EU | Lavinio Gualdesi | edgelab@edgelab.eu

**AMOGH**

Amogh is a third generation Autonomous Underwater Vehicle (AUV), developed in collaboration with Larsen & Toubro, Mumbai, India and Edgelab. Amogh is designed to comply with the International Hydrographic Organization standards for hydrographic surveys and IMO regulations for navigation safety. The containerized design with integrated LARS-Launch & Recovery System, and the maintenance support system is suitable for ease of implementation and installation. Amogh is equipped with the latest state-of-the-art sensors, payloads, propulsion and energy system, making it a first-class AUV for hydrographic and underwater surveillance and recognition operations.

**U_MAPPER****U-MAPPER**

Smart, low-cost, heavy-duty, cooperative swarm navigation, modular approach for easy integration of AUV size payloads, customized, high quality maps from better image reconstruction methods and improved location accuracy of AUVs, fast and low cost horizontal surveys of large areas with multimodal sensing, monitor changes via back-to-the-site missions, hybrid usage ROV/AUV.

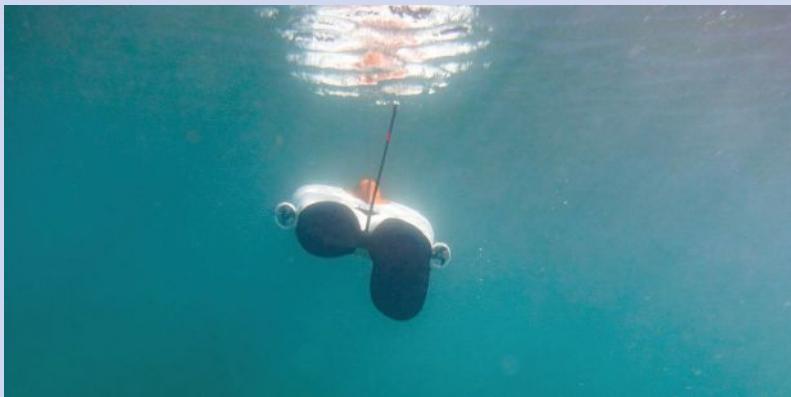
**U-TRACKER**

Designed with modularity common criteria to make simple and immediate testing of new sets of sensors. Connections between various models realized with a simple, interchangeable mechanical interface system. Payload is customizable as with Webcam, CTD, Side Scan Sonar, other AUV-class sensors. High maneuverability with 2 azimuthal + 2 lateral ducted propellers.



EVOLOGICS

WWW.EVOLOGICS.DE | Francisco Bustamante | sales@evologics.de



POGGY AUV

Poggy is a bionic autonomous vehicle based on the Fin-Ray® technology. The AUV is a one of a kind, novel bionic design with two propulsion thrusters and two independent flexible "tails" that give the robot unique mobility features. Its dual-tail construction is an original idea that stemmed from previous work on EvoLogics' Manta Ray AUV and its lifelike "flapping wing" propulsion system. The design was simplified and optimized - the robot lost the wings, and its tail was divided in two. Both parts of the dual-tail use independent bionic Fin-Ray® drives and allow for precise heave, pitch and roll adjustments, enabling dynamic climbs and dives, leveled gliding and bottom following.



QUADROIN AUV

The Quadroin is a next generation AUV with low-drag bionic design. Innovative spindle-shaped flow bodies, modeled after penguins, achieve ultra-low drag coefficients in the water. The technical design choices maintain the shape and contour of an idealized penguin-like body without protruding parts to facilitate the highest drag efficiency. Driven by four rear thrusters, this AUV shows excellent hydrodynamic performance and maneuverability. It is up to 10 knots fast and highly energy efficient.



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GENERAL DYNAMICS MISSION SYSTEMS - BLUEFIN ROBOTICS PRODUCTS

WWW.GDMISSIONSYSTEMS.COM | Jonathan Lesser | Jonathan.Lesser@gd-ms.com



BLUEFIN™-9 UNMANNED UNDERWATER VEHICLE (UUV)

The General Dynamics Mission Systems Bluefin™-9 autonomous unmanned underwater vehicle provides unmatched high-resolution data, leading navigation, data processing and mission turnaround time in a two-man portable UUV. Featuring a full carbon fiber body, a carefully selected and smartly integrated suite of sensors, latest generation communications and navigational components, and new onboard processing capabilities.



SUR | VC&L



BLUEFIN™-12 UNMANNED UNDERWATER VEHICLE (UUV)

Advanced, Mission-Ready and Modular The Bluefin™-12 is a lightweight medium-class UUV designed to deliver mission critical data and complete high-consequence and changing missions. Built with robust core capabilities, increased modularity, embedded intelligence, data processing, and extended operational range, the Bluefin-12 is ready for today's mission and prepared for tomorrow's threats. (Customizable)



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BLUEFIN™-21 UNMANNED UNDERWATER VEHICLE (UUV)

The Bluefin-21 is a highly modular autonomous underwater vehicle able to carry multiple sensors and payloads at once. It boasts a high energy capacity that enables extended operations even at the greatest depths. The Bluefin-21 has immense capability but is also flexible enough to operate from various ships of opportunity worldwide. (Customizable)



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GRAAL TECH

WWW.GRAALTECH.COM



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X-300 AUV

X-300 is a torpedo-shaped Autonomous Underwater Vehicle (AUV) capable of executing a wide variety of missions in the fields of O&G, Defense & Security, Oceanography and Environmental Monitoring. It is made up of a pair of carbon fiber cylinders connected to two terminating wet sections where steering and propelling thrusters are located, together with a bladder enabling variations of the vehicle buoyancy. (Customizable)



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X-300 EXPLORER

X-300 Explorer is a customization of X-300 AUV specifically designed for underwater inspection tasks and search operations of objects on the seabed. The short configuration makes the vehicle even more manoeuvrable and easier to be deployed and recovered. The available optic fibre tether provides real-time images from the on-board sensors and allows the user to take control of the AUV for manoeuvring it like an ROV, whenever a closer look to a detail of interest is required. (Customizable)



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HUNTINGTON INGALLS INDUSTRIES

WWW.HYDROID.COM

Sales | sales@hydroid.com



REMUS 100

The REMUS 100 is one of the most prolific small class AUVs with over 400 sold worldwide. This two-man portable, low logistics AUV is outfitted with various sensors and payloads to collect data and imagery in the ocean. (Customizable)



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HUNTINGTON INGALLS INDUSTRIES

WWW.HYDROID.COM | Sales | sales@hydroid.com



REMUS 300

The new REMUS 300 is a small class, modular AUV that provides maximum payload flexibility while remaining two-man portable. This 300 meter depth rated, open architecture AUV offers field-swappable energy options allowing up to 29 hour mission duration. (Customizable)



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REMUS 600

The REMUS 600 is a medium class, modular AUV that can carry advanced sensors and payloads. This 600 meter depth rated AUV supports the growing need for operations requiring endurance, increased payload capacity and greater operating depth. (Customizable)



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REMUS 6000

The New Generation REMUS 6000 AUV boasts the same proven software and electronic subsystems found in our highly successful REMUS 100 AUV, with a depth rating, endurance and payload that allows for autonomous operations in up to 6000 meters of water. (Customizable)



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RBR



» CTD instruments, such as the RBRlegato³, are designed for integration into ocean gliders, profiling floats, and AUVs to measure sound velocity, density, and salinity. (Photo credit: RBR)

CTD TECHNOLOGY DELIVERS HIGH-PERFORMANCE SENSOR HUB FOR AUTONOMOUS VEHICLES

With almost 50 years of experience in designing and manufacturing precise oceanographic instrumentation, RBR is committed to driving product innovation that puts our users' needs first. Offering a wide suite of robust and versatile sensors, loggers, and integrated systems, RBR instruments have been deployed into every ocean by major oceanographic centres worldwide. They have performed to the highest standards in the most extreme environments. A reliable presence, our adaptable sensor packages seek to optimize operational efficiency and deployment cost.

Designed for integration into ocean gliders, profiling floats, and AUVs, the RBRargo³, RBR/legato³, and RBRcentauro³ C.T.D instruments measure sound velocity, density, and salinity, while providing a high-performance sensor hub with ultra-low power consumption. This now proves to be crucial to the next generation of vehicles that are expected to sample for longer periods, at faster sample rates, and carry more sensors.

A NEW STANDARD IN CTD

At the heart of these RBR instruments is the naturally-flushed inductive conductivity cell, a new standard in high-accuracy CTD technology. The unpumped design boasts a power consumption that is 90 percent lower than pumped CTDs, without sacrificing performance. On Argo floats, the low-power measurement reduces the cost-per-profile while allowing the floats to profile more rapidly for high-resolution operations or measure longer for long-term monitoring programs. This innovative design has no moving parts, eliminating vibrations and noise. For gliders

and AUVs, the completely silent operation is ideal for low-power, stealth missions, and passive acoustic listening.

ACCURACY IN NEAR-SURFACE WATERS

In addition, RBR CTDs are well-suited to measurements in near-surface waters. Unlike electrode-based cells, which are highly susceptible to even microscopic amounts of fouling, the inductive conductivity cell is unaffected by trace amounts of contaminants like surfactants and oils. The technology has demonstrated stability, accuracy, and resolution over time, and retains its calibration accuracy in extreme measurement conditions, including freezing. RBR CTDs withstand shock and impact forces due to their robust construction, and are easy to transport, clean, and maintain.

NURTURING RESPONSIVE PARTNERSHIPS

Since its introduction in 2000, thousands of CTDs with inductive conductivity cells have been built at RBR. The Argo-approved RBRargo³ C.T.D has been integrated with nearly every autonomous float manufacturer. Similarly, RBR/legato³ and RBRcentauro³ C.T.D instruments can be found on ocean gliders, AUVs, and ASVs from a growing number of manufacturers. The dedicated OEM technical team at RBR develops responsive partnerships with vehicle manufacturers and system integrators by listening carefully to the challenges and bringing electronics, mechanical, and scientific expertise to the solution.

For more information, visit rbr-global.com.

HYDROMEAWWW.HYDROMEA.COM

Alexander Bahr | alexander.bahr@hydromea.com

**INDEPENDENT ROBOTICS**WWW.INDEPENDENTROBOTICS.COM

info@independentrobotics.com

**AQUA 2**

The Aqua2 is an amphibious hexapod robot capable of propelling itself on land or through the water. The use of six independently controlled thrusting surfaces makes the unit very maneuverable and produces minimal disturbance to the surrounding environment. The Aqua2 is programmable and configurable, can be deployed for tethered or untethered use, and is an ideal platform for submersible robotics projects, environmental monitoring, and propulsion research. (Customizable)

**INTERNATIONAL SUBMARINE
ENGINEERING LTD. (ISE)**WWW.ISE.BC.CA | Sales | info@ise.bc.ca**ISE EXPLORER AUV**

The ISE EXPLORER Autonomous Underwater Vehicle (AUV) collects IHO compliant data at a rate of 750 to 1100 km per week of ship time with all sensors operating and is the most modular and maneuverable AUV in the world today. The modular design of the EXPLORER enables it to carry multiple payloads in its spacious, swappable, and customisable payload section. The Explorer is available in 3000m, 6000m and other custom depth ratings. (Customizable)



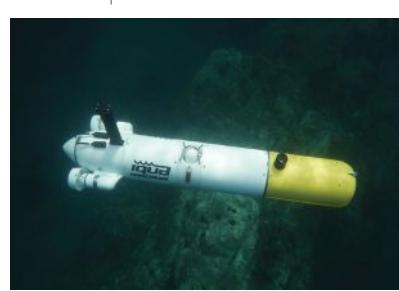
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**INTERNATIONAL SUBMARINE
ENGINEERING LTD. (ISE)**WWW.ISE.BC.CA | Sales | info@ise.bc.ca**THESEUS AUV**

ISE commenced development of the Theseus AUV, another in a long line of advanced robotic systems, under contract with the Canadian Department of National Defence as part of the joint US-Canada Spinnaker project. The requirement driving the development of Theseus was the laying of long lengths of fiber-optic cable under the Arctic ice pack. The project was successfully completed with two deployments to the Arctic with the second culminating in the laying of several 220 km cables in 600 meter water depths under a 2.5 meter thick ice pack, establishing an AUV endurance record of over 60 hours – all under ice.



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IQUA ROBOTICSWWW.IQUAROBOTICS.COM | Joseta Roca | joseta.roca@i quarobotics.com**GIRONA 500 AUV**

The Girona 500 is a reconfigurable autonomous underwater vehicle (AUV) designed for a maximum operating depth of up to 500 m. The vehicle is composed of an aluminium frame which supports three torpedo-shaped hulls of 0.3 m in diameter and 1.5 m in length as well as other elements like the thrusters. This design offers a good hydrodynamic performance and a large space for housing the equipments while maintaining a compact size which allows to operate the vehicle from small boats. The most remarkable characteristic of the Girona 500 is its capacity to reconfigure for different tasks. (Customizable)



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SPARUS II AUV

SPARUS II AUV is a lightweight hovering vehicle with mission-specific payload area and efficient hydrodynamics for long autonomy in shallow water (200 meters). It combines torpedo-shape performance with hovering capability. It is easy to deploy and to operate. The payload area can be customized by the end user and it uses an open software architecture, based on ROS, for mission programming. Its flexibility, easy operation and openness makes the SPARUS II AUV a multipurpose platform that can adapt to industrial, scientific and academic applications. (Customizable)



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Whatever the mission...

Okeanus designs and manufactures mission-critical ocean equipment for commercial and government agencies throughout the world. We harness breakthrough Science and Technology to equip clients with the tools and trusted support they need for the rigors of ocean exploration.

Our comprehensive product portfolio—from customized deck equipment, including winches, LARS and A-Frames, to our extensive range of underwater survey and sampling equipment—is available for purchase or rent, and rapid deployment.

Whatever your mission, Okeanus has turn-key solutions to make it a success.

okeanus.com



KONGSBERG MARITIME

WWW.KM.KONGSBERG.COM | Sales | km.sales@kongsberg.com

**EELUME**

Eelume underwater Intervention vehicles are basically self-propelled robotic arms whose slender and flexible body can transit over long distances and carry out light inspection, maintenance and repair jobs in confined spaces not accessible by conventional underwater vehicles. It will be equipped with several types of sensors and tools needed to fulfil its mission.. (Customizable)

**HUGIN**

HUGIN is the most commercially successful AUV in the world, having completed over 600,000 line kilometres of paid survey. Proven by operations in harsh operations. Proven by operations in harsh open ocean conditions from Africa to South America HUGIN is the most robust AUV platform providing IHO standard data quality. (Customizable)

**HUGIN ENDURANCE**

HUGIN Endurance can be configured with a range of sensors focused on mission capabilities and situational awareness. This includes the proven hydro-acoustic instruments for mapping and inspection purposes, such as the KONGSBERG HISAS family of synthetic aperture sonars and the EM® family of multibeams. Both underwater and surface awareness sensors are used for autonomous decision making. (Customizable)

**SUPERIOR**

The HUGIN Superior AUV System is the most capable commercially available AUV. It offers the best data quality and coverage coupled with the most accurate navigation and positioning solution there is. Packaged as a complete system, HUGIN Superior carries more sensors than ever before over greater distances enhancing productivity and cost effectiveness. HUGIN Superior is simply the best AUV you can get. (Customizable)

**L3HARRIS**

WWW.L3HARRIS.COM

Jim Kirk | IVER.sales@L3Harris.com

**IVER3**

Iver3 is the first commercially developed family of low-cost AUVs. Iver3 is single man-portable and is ideal for coastal applications such as sensor development, general survey work, sub-surface security, research and environmental monitoring. Iver3 benefits from 15 years of experience in building reliable systems with well over 300 AUVs shipped. (Customizable)



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**IVER3 EP**

Iver3 EP open system AUVs incorporate all standard Iver3 features along with options for added forward payload sections and an intuitive API for remote helm applications. Iver3 EP is an open system where the users can install their hardware and make software extensions to the vehicle without a custom design. (Customizable)



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L3HARRIS

WWW.L3HARRIS.COM | Jim Kirk | IVER.sales@L3Harris.com



IVER4 580

The Iver4 580 offers users a 200-meter depth survey system featuring hot-swappable battery sections that can be changed in the field without any special tools. The Iver4 580 offers users a 200-meter depth survey system featuring hot-swappable battery sections that can be changed in the field without any special tools. (Customizable)



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OCEAN AERO

WWW.OCEANAERO.COM
info@oceanaero.us



TRITON

Triton is the world's only wind and solar powered, intelligent autonomous vehicle that both sails and submerges for unparalleled data collection and intelligence gathering in some of the hardest-to-reach-places on the planet. Intelligently designed with advanced materials, Triton can be configured to carry an almost infinite variety of payloads to complete any mission. (Customizable)



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IVER4 900

The Iver4 900 UUV offers users a 300-meter workhorse system featuring extended duration capability of 20+ hour run times for long ingress/egress missions. The Iver4 900 carries the highest performing navigation and imaging sensors available, while using swappable battery chemistries that meet flexible mission needs. (Customizable)



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OCEANEERING INTERNATIONAL, INC.

WWW.OCEANEERING.COM



OCEAN SURVEYOR

Standard Equipment: C-Nav L-Band DGPS | Inertial Navigation | Simrad HiPAP USBL | RDI Navigator Doppler Velocity Log | Kalman Filter | Digiquartz Depth Unit | SBE 49 FastCAT CTD Sensor | Multibeam Echosounder: Kongsberg Simrad EM 2040 | EdgeTech / Side Scan Sonar: 120 / 410 kHz Chirp AUV | EdgeTech / Sub-bottom Profiler: 2-16 kHz Chirp | Black and White High Resolution Digital Camera | 2G Robotics / ULS-500 Pro Laser Line Scanner | Magnetometer Battery: Lithium Ion. (Customizable)



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 **EdgeTech**
The Leader in Underwater Technology

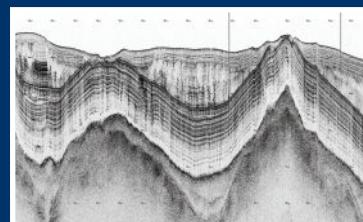
Clearly Superior Imaging

SONAR SYSTEMS

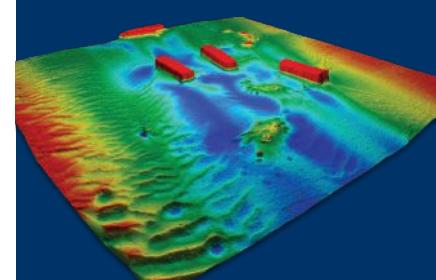
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**LAUV**

Lightweight AUV targeted at innovative research. The LAUV is a rugged, cost-effective, Lightweight Autonomous Underwater Vehicle, designed to be simple to deploy, operate, and recover by one person. The open source software, makes easy the integration of new payload and algorithms. The LAUV is used worldwide by Navies and R&D institutions. (Customizable)



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QINETIQ NORTH AMERICA

WWW.QINETIQ-NA.COM
Knut Streitlien | knut.streitlien@qinetiq-na.com

**SEA SCOUT**

Sea Scout™ is a general purpose UUV that can be deployed with a standard A-size sonobuoy launch container. It can have up to two optional payload sensors.

**RTSYS**

WWW.RTSYS.EU
Sales | info@rtsys.eu

**COMET 300**

COMET 300 is a cost-effective operational AUV with real-time positioning and acoustic communication system, designed to meet the current needs of marine research and industry. It can be used in swarm mode to communicate with other drones to position themselves and realize joint missions. Furthermore, RTsys has developed a module that allows drones to dock into a station. (Customizable)

**RTSYS**

WWW.RTSYS.EU
Sales | info@rtsys.eu

**NEMOSENS**

NemoSens is a micro-AUV with an open Linux architecture which can embark various payloads such as CTD probe, echosounder or side-scan sonar. Light and portable, it is less than one meter long and can last up to 8 hours at 4 knots during mission time. It can also navigate in swarm and reposition itself thanks to acoustic communications. (Customizable)



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SAAB SEAEDGE

WWW.SaabSeaeye.com
James Douglas | solutions@sabseaeye.com

**SEAEYE SABERTOOTH**

The Sabertooth is a hybrid AUV / ROV capable of working in deep water either as an autonomous vehicle or via a tether. Its power, tether-free operation and 360° hovering manoeuvrability make the Sabertooth an ideal option for autonomous inspection or maintenance and repair tasks as well as offshore survey work. (Customizable)



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SEATOOLS

WWW.Seatoools.com
Sales | sales@seatoools.com

**ACTDM - INSPECTION AUV**

On request of Alcatel-Lucent, Seatoools performed a conceptual design study on an AUV capable of accurately monitoring and recording a cable's touchdown point. The autonomous vehicle is capable of traveling down the cable and subsequently maintains station at a predefined altitude near the touchdown point. During cable laying, the vehicle maintains this position and continuously measures and records the cable touchdown point. (Customizable)



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STRATEGIC ROBOTIC SYSTEMS

WWW.SRSFUSION.COM

Jesse Rodocker | jesse@srsfusion.com



FUSION-HYBRID

FUSION The FUSION is a multipurpose UUV with both AUV and ROV functionality. Complete with a full suite of sensors including side scan, forward looking multi-beam, HD video, DVL and USBL. The highly intuitive control system coupled with the compact footprint and ability to conduct tethered or untethered missions make the FUSION a versatile system. (Customizable)



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SUBSEA TECH

WWW.SUBSEA-TECH.COM

Sales | st.sales@subsea-tech.com



TORPEDO

The Torpedo AUV is an autonomous underwater vehicle specially designed for the internal inspections of pipelines and tunnels at distances up to 5000m. The vehicle is equipped with a front HD color video camera with integrated LED lighting and can be also fitted with various other sensors such as multibeam sonar (acoustic imaging) and acoustic profiler. (Customizable)



SUR

TELEDYNE GAVIA

WWW.TELEDYNEMARINE.COM/GAVIA

Sales | gavia_sales@teledyne.com



GAVIA AUV

THE GAVIA AUTONOMOUS UNDERWATER VEHICLE (AUV) is a self-contained, low logistics, modular survey platform capable of delivering high quality data while operating from vessels of opportunity or from the shore. (Customizable)



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VOYIS 

AUV LASER SCANNING & IMAGING PAYLOADS

**See the depths
like we see
the surface.**

- ✓ Simplified AUV integration
- ✓ Increased survey efficiency by enabling autonomy
- ✓ Capture optical data at high speeds
- ✓ Gain deeper understanding with high-res data

www.voyis.com



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OSPREY AUV

The Osprey™ is a survey grade 2000m depth rated autonomous underwater vehicle (AUV) capable of inspection and survey work. The long endurance Osprey hosts a wide variety of sensor packages including sidescan sonar, multibeam sonar, and synthetic aperture sonar; and maintains the same modularity as the Teledyne Gavia for low logistics and multi-mission support. (Customizable)



SUR

**SEARAPTOR AUV**

The SEARAPTOR™ is a survey grade deep water autonomous underwater vehicle (AUV) designed to operate at abyssal depths. A wide range of sensors allow the SeaRaptor™ to complete several types of missions including: broad area search with side-scan sonar, hydrographic survey with multibeam and sub bottom profiler, and high resolution inspection survey with camera and acoustic sonar. (Customizable)



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TRANSMARK SUBSEA AS

WWW.TRANSMARK-SUBSEA.COM

Marcel Bras | marcel@transmark-subsea.com

**ARV-I**

ARV-i provides its customers with a range of operational configurations. As a resident vehicle, ARV-i will spend its time entirely underwater, for up to 12 months per deployment. The vehicle is designed to be autonomous, using prior programming and onboard intelligence to locate and observe underwater assets. When its battery is low, ARV-i will return to its proprietary docking station for wireless battery charging and transfer of data collected from the completed excursion.



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YSI INTEGRATED

WWW.YSI.COM

ysi.systems@xyleminc.com

**I3XO ECOMAPPER AUV**

The Iver3-580 options include Side Scan, Bathymetric, Environmental Sensors, User 2nd CPU, Camera, Iridium, Modem and Handheld Remote.



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Seathe Difference

Photos: Aft deck and control room of CSA's R/V Dolphin

From Coastal
to Deep Sea



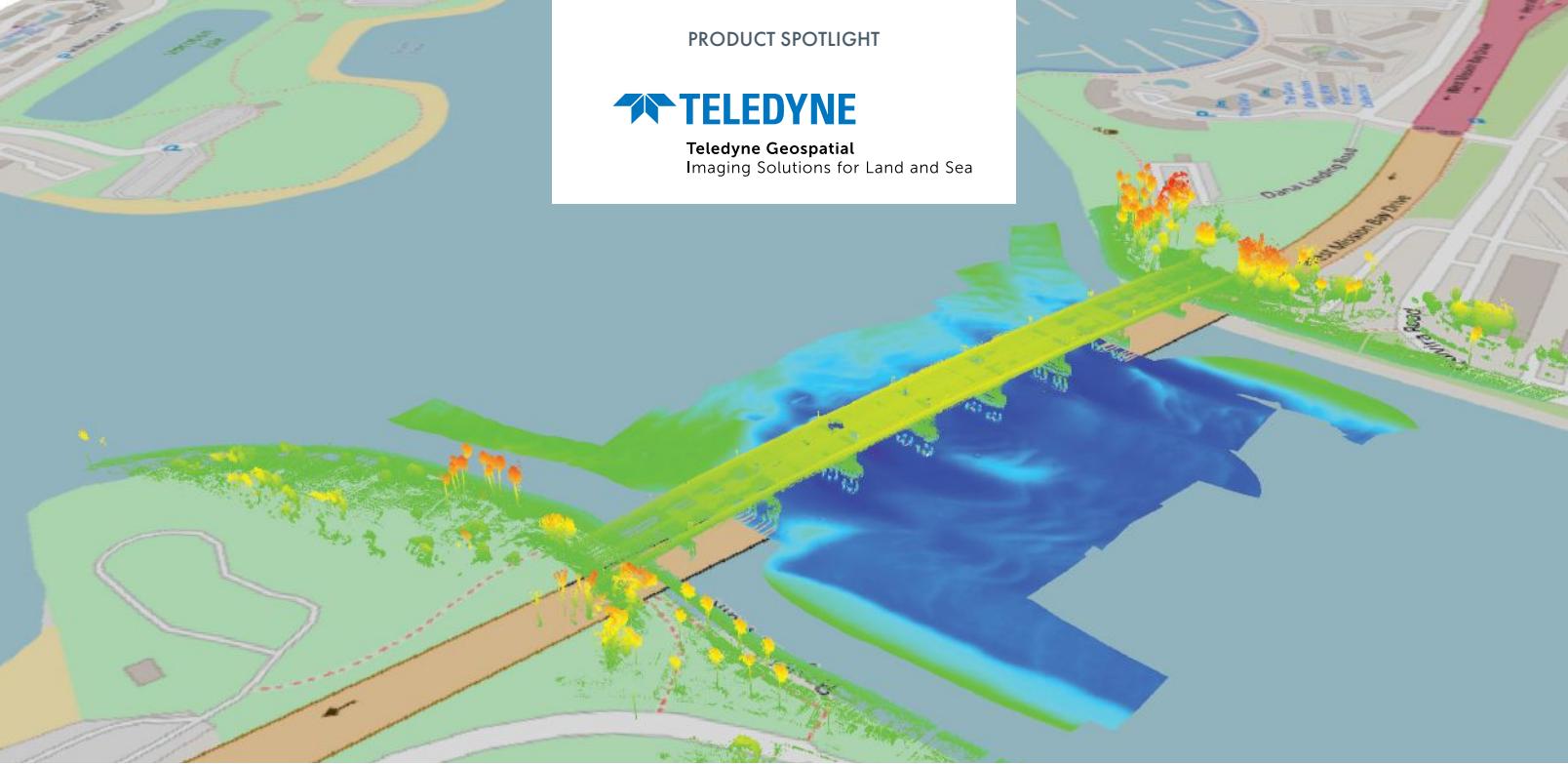
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Teledyne Geospatial
Imaging Solutions for Land and Sea



» Hydrographic surveys can be easily enhanced to provide data for land and structures acquired with CARIS Collect. (Image credit: Teledyne Geospatial)

WELCOME TO THE NEW GEOSPATIAL

Teledyne Geospatial is the unification of Teledyne Optech and Teledyne CARIS, who have combined to offer holistic solutions to seamlessly map land and sea through the integration of industry-leading LiDAR sensors combined with world-renowned software workflows.

Teledyne Optech has been a world leader in the design, development, and manufacture of advanced LiDAR instruments for more than 45 years. And for nearly four decades, Teledyne CARIS has been developing market-dominating software designed for the marine GIS community.

This collaboration provides customers with a competitive edge in mapping and delivering data products inside of one complete workflow. Ease of collection and processing through to final products is enhanced with efficiency-driving AI noise classifying algorithms and real time quality control.

MOBILE LIDAR FOR MARINE APPLICATIONS

Teledyne Optech has a range of LiDAR systems capable of being installed as part of a full marine survey suite; combined with multibeam bathymetry provides the full picture above and below water. The systems range from the flexible Polaris, which is as capable on a tripod as on a vessel, the TLS-M3 designed to operate in harsh environments, to the lightweight CL-360 to fit on small USVs. All three systems deliver proven results from terrestrial survey to the marine domain, offering survey grade range

accuracy and precision to easily meet survey requirements.

THE NEW PING TO CHART

Teledyne CARIS products have developed over time with a focus on the 'Ping to Chart' mentality. Taking data collected from a sonar ping and processing it through to final products, traditionally being paper or digital charts.



» The TLS-M3 was designed to focus on the most aggressive applications, with a weather-proof housing, internal sensors including: heat system, inclinometer, digital compass, and a long-range capability that can reach 2000 m. (Image credit: Teledyne CARIS)

In consideration of the expanding needs of the community, the CARIS software stack and workflows have also evolved to a 'Sensor to Cloud' mentality by leveraging AI and cloud technology trends to help bring hydrography into the new hydrospatial era. In addition to cloud technology, products are also available for 'the edge,' designed to be deployed on the survey platform. This includes CARIS Collect, which is a data acquisition tool for planning surveys and logging sensor data, as well as CARIS Onboard, an edge processing tool to convert high volume sensor data to low volume information products.

A GEOSPATIAL SOLUTION

One example of a Geospatial solution, bringing together the best of Optech hardware and CARIS software, is the combination of CARIS Collect and the TLS-M3. CARIS Collect offers a streamlined solution for the TLS-M3, including real-time display of georeferenced points and integrated controls for the TLS-M3 settings. The TLS-M3 is built with a weather-proof housing, internal heat system, and a long-range capability that can reach up 2,000 meters. CARIS Collect and the TLS-M3 can seamlessly integrate with the existing multibeam systems to create a complete marine survey solution.

For more information, visit:
www.teledynegeospatial.com.

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5G INTERNATIONAL

WWW.5GMARINE.COM | Sales | robert.asia11@gmail.com

**4 METER HYDRA**

"Hydra" is equipped with a complete 'state of the art' sensor suite and HD day/night vision video cameras with high bandwidth telemetry. These features provide operational awareness for commercial pilots and mission specialists not seen outside of military grade installations.



VC&L

**11 METER SOF BRAVO**

The "Bravo" has been configured to be easily convertible, e.g. seats, equipment, towed arrays and sensor suites. Hard points are built in for mounts. This platform is extremely suitable for cargo transport.

**9 METER OSCAR**

"Go Green" we did! This model was created before the revolution in green technology began. Now there are many options of how large or small of an electric drive you need and we will provide any ratio of power to electric drive to suit your specifications for speed and endurance.

**SEA SERPENT**

"Sea Serpent" is a remotely operated USV, perfect for harbor, riverine and near-coastal operation. Applications include multi-spectral data logging for environmental studies, simulations/training and surveillance for security purposes. "Sea Serpent" is an economical platform. The computing systems are powerful and Can Bus compatible. A/D ports and ROV functions barely touch the CPU's capabilities.

**AUTONOMOUS MARINE SYSTEMS**

WWW.AUTOMARINESYS.COM | Scott Nguyen | info@automarinesys.com

**THE DATAMARAN**

Autonomous Marine Systems delivers a global platform for ocean observation using intelligent sensor networks powered by the Datamaran. Our unmanned surface vehicles autonomously collect data from above and below the surface of almost any body of water and transmit this information directly to our clients.

**AUTONAUT**

WWW.AUTONAUTUSV.COM

Sales | info@autonautusv.com

**AUTONAUT 3.5M**

AutoNaut is a storm-proven USV, wave propulsion provides long endurance. Silence and low profile make her a superb surveillance platform. Sensors on mast, through hull, and towed



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**AUTONAUT 5.0M**

The AutoNaut 5.0 is designed for versatility. It has a larger carrying capacity for sensors, batteries and solar panels. The modularity of the design gives a flexible payload and for ease of transport the hull can break down into two halves.



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ATLAS ELEKTRONIK

WWW.ATLAS-ELEKTRONIK.COM

info@uk.atlas-elektronik.com



ARCIMS

ARCIMS provides a toolbox of capabilities for multi-influence minesweeping, mine hunting and other operations. It enables manned or fully autonomous mission module operation including launch and recovery of off-board systems. Using "in-theatre" proven technology, ARCIMS enables the operator to counter a wide range of threats in a flexible and affordable package.



DOTOCEAN

WWW.DOTOCLEAN.EU

Sales | sales@dotoclean.eu



CALYPSO

The Unmanned Survey Platform (USP) Calypso is an inflatable, full autonomous surface vehicle that can carry a wide range of sensors for hydrographic and environmental surveys.



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DEEP OCEAN ENGINEERING, INC.

WWW.DEEPOCEAN.COM | Sales | sales@deepeccean.com



PHANTOM® I-1650 USV

The Phantom® I-1650 USV is a powerful, 1.65m, remotely controlled, battery-powered unmanned surface vessel designed and manufactured by Deep Ocean Engineering to conduct measurements of currents, bathymetry and discharge with ADCPs. (Customizable)



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PHANTOM® H-1750

The Phantom® H-1750 USV is a powerful, 1.75m, remotely controlled, battery-powered, catamaran-style unmanned surface vehicle designed and manufactured by Deep Ocean Engineering to conduct measurements of currents, bathymetry, discharge and surveys in a variety of environments. The advanced technology of the Phantom® H-1750 USV can be equipped with GPS, depth sounder, sonar and a variety of sensors. (Customizable)



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ECA GROUP

WWW.ECAGROUP.COM | Anthony Penn | sales.robatics@ecagroup.com



INSPECTOR 90

The USV Inspector 90 is a multipurpose drone platform based on hydrojet propulsion, able to be operated in autonomous mode, remote control or onboard steering. Its performances and its accuracy make it efficient in protection missions, recurrent operations, mine warfare activities and Rapid Environment Assessment. Its open design permits to deploy a large range of payloads.



INSPECTOR 120

The USV INSPECTOR 120 is a high reliable multipurpose naval platform. Based on a sea proven hull shape it is designed for very demanding operations in various sea state conditions. The performances of its electronics and its navigation accuracy make it compliant with manned, remote controlled and fully autonomous coastal and open sea maritime missions such as infrastructure protection, mine warfare or rapid environmental assessment.



ECA GROUPWWW.ECAGROUP.COM

Anthony Penn | sales.robots@ecagroup.com

**INSPECTOR 125**

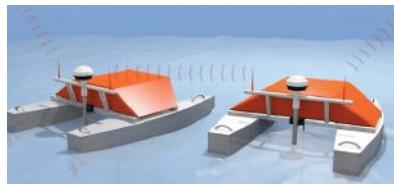
The INSPECTOR 125 is a "carrier USV" capable of transporting and deploying payloads formerly reserved for larger manned vessels. It is capable of launching and recovering the A18 AUV, the T18 towed sonar and the SEASCAN identification and K-STER neutralization robots as well as towing a minesweeping system. The INSPECTOR 125 is also equipped with a mine and obstacle avoidance sonar (MOAS) with a mine detection and classification performance never before achieved.

**EMMA TECHNOLOGIES GMBH**WWW.EMMA-TECHNOLOGIES.COM

ask-emma@emma-technologies.com

**BOSS**

BOSS - the first workclass vehicle for environmental monitoring and inspection applications in hard to reach areas, difficult environments or very shallow water regions.

**HYCOPS**

HyCOPS – most advanced system for georeferenced water column sampling and imaging. True parallel survey-line piloting under harsh environmental conditions. Unique swarm capacity mode.

**FUGRO**WWW.FUGRO.COM

www.fugro.com/contacts

**FUGRO BLUE SHADOW**

Fugro Blue Shadow has been designed for safe and efficient hydrographic and geophysical survey operations for medium to large scale projects, in both nearshore and offshore environments. Its wave-piercing design and stability enables greater weather tolerance and the ability to operate in high sea states. Equipped with dual-band radar, automatic identification system (AIS) and 360° view cameras (including infrared for night operations), Fugro Blue Shadow has advanced situational awareness and incorporates both obstacle and collision avoidance within its navigation software to ensure operations are conducted to the highest safety standards.



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EVOLOGICS GMBHWWW.EVOLOGICS.DE | Francisco Bustamante | sales@evologics.de**SONOBOT USV**

SONOBOT USV offers a usable platform for planning and executing a hydrographic survey, delivering accurate geo-referenced bathymetric measurements and high-quality imagery with minimum transport, launch and recovery efforts.

**FUGRO BLUE ESSENCE (12 M) AND FUGRO BLUE ECLIPSE (18 M)**

Fugro's Blue Essence and Blue Eclipse (to be launched in 2022) USVs come with a Blue Volta electrical remotely operated vehicle (eROV) and launch-and-recovery system. This is a unique solution for efficient inspection requiring no offshore crew.



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GPA SEABOTS

WWW.GPASEABOTS.COM
Jaume Viñola | j.vinola@gpaseabots.com



SB 100 PRO

The SB 100 PRO is an Unmanned Surface Vehicle (USV) designed to operate in environments such as harbours, marinas, reservoirs, mining lakes, rivers, coastal strip, ponds... in short, calm waters. Its special design makes it the most versatile USV on the market, capable of integrating almost any type of marine instrumentation thanks to its customised Blackbox, Ground Station and tripod, modern remote controller, frontal camera with live image among others. (Customizable)



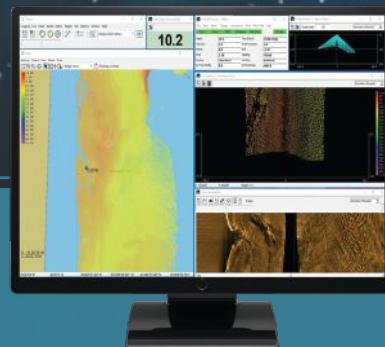
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GRAAL TECH

WWW.GPASEABOTS.COM | Jaume Viñola | j.vinola@gpaseabots.com



MGB-300 USV

MGB-300 is the newest Graal Tech autonomous vehicle belonging to the X-300 family. It is an Unmanned Surface Vehicles (USV), equipped with a long-range radio device and an underwater acoustic modem. When used in combination with one or more X-300 AUVs can act as a data gateway between the underwater vehicles and the control station. Like its parent X-300, MGB-300 is characterized by high manoeuvrability, flexible payload modularity, and open control system, making it a unique and versatile platform that can comply with many different mission needs. (Customizable)



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H2O ROBOTICS

WWW.H2O-ROBOTICS.COM | Sales | marin@h2o-robotics.com



H2OMNI-X

H2Omni-X is autonomous unmanned surface platform specialized for seafloor and surface surveying, mapping and inspection. Due to its modular and clever design it can easily be operated by a single person. This means logistics and deployment are simpler than with any other similar vehicle! By using different sensors on board or configuration options, the platform can be modified for a new mission in under an hour!



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Sales | sales@hi-target.com.cn

**iBOAT BS2**

iBoat BS3 USV is a swift and intelligent surveying unmanned surface vehicle with unmatched usability and professional hull design. It is equipped with a high-performance single beam echo sounder, high-precision GNSS positioning and on-board data control and acquisition software. The excellent sounding module offers a measurement range from 0.15 m to 300 m, able to adapt to different working environments. Besides, ADCP and side-scan sonar can also be added for versatile applications. (Customizable)



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HYDRONALIXWWW.HYDRONALIX.COM | Sales | info@hydronalix.com**HYDRONALIX**WWW.HYDRONALIX.COM | Sales | info@hydronalix.com**NIX**

M-Hull configuration provides stability at high speeds while generating virtually no wake or noise. Fuel injected Hybrid Engine power supply, available in 3 KW. Optional high power gimbal stabilized Electro-Optical and Infrared Cameras with auto-tracking software. Optional side scan and downward imaging sonar.



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Optional X-Band Radar. Fuel injected Hybrid Engine power supply 4 KW. High band width INMARSAT satellite communications. Optional side scan and downward imaging sonar. High efficiency planing hull. Bright LED Navigation lights.



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HYDRONALIXWWW.HYDRONALIX.COM | Sales | info@hydronalix.com**AMB**

Optional X-Band Radar. Advanced Small Surface Robotic Systems. Fuel injected direct drive 2 KW engine with 100 W generator starter. Optional high power gimbal stabilized Electro-Optical and Infrared Cameras with auto-tracking software. Optional side scan and downward imaging sonar.



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IBMWWW.IBM.COM**MAYFLOWER**

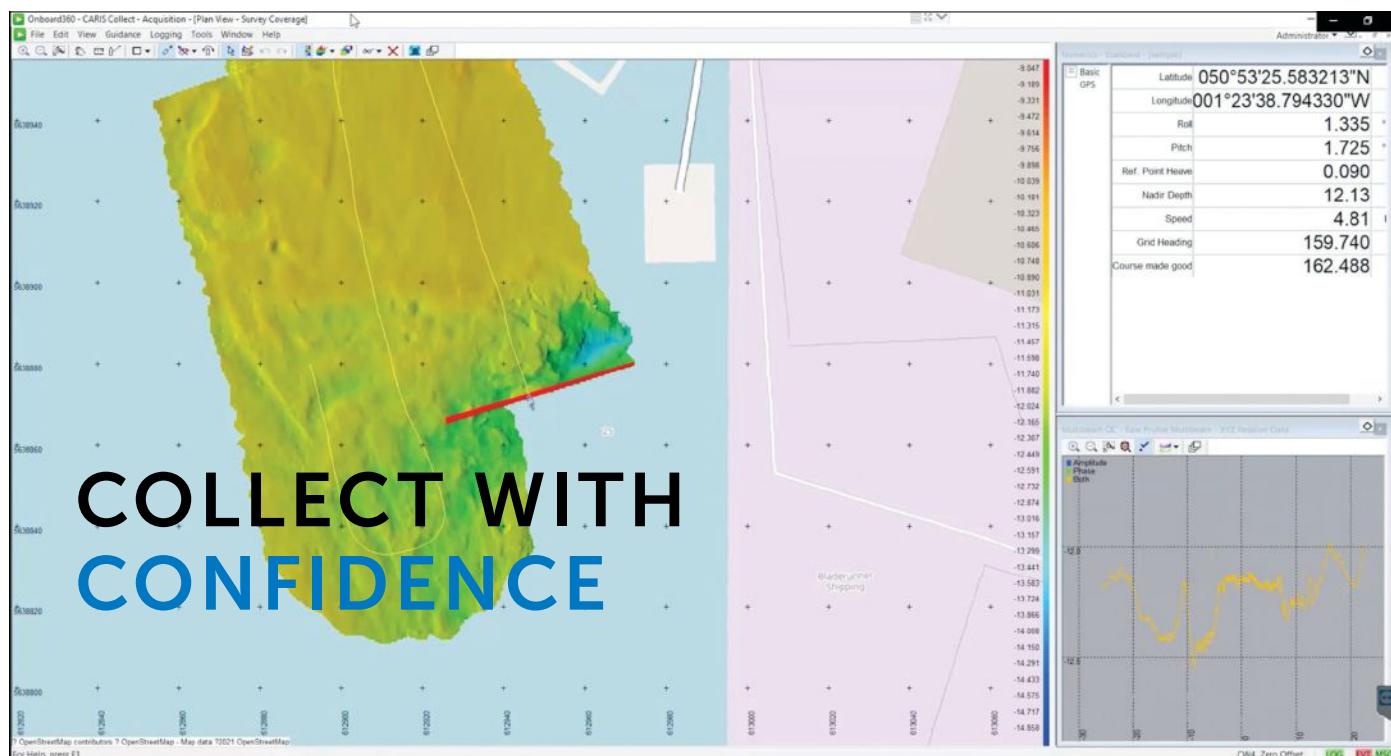
The maritime research vessel Mayflower Autonomous Ship is a first-of-its-kind autonomous ship — and IBM technology played a central role in bringing it to life. On its inaugural journey, the ship will commemorate the original Mayflower by following its transatlantic route.



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FOR MORE INFORMATION:

www.teledynegeospatial.com/cariscollect



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IN NATURE ROBOTICS LTD.WWW.INNATUREROBOTICS.COM

Murray Lowery-Simpson
murray@innaturerobotics.com

**AMOS**

AMOS (Aquatic Mini Observation System) is an autonomous, solar-powered airboat used for water quality monitoring and surveying applications. It is intended for long-term deployments in inland or coastal regions, potentially in shallow water with significant amounts of vegetation. (Customizable)



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INTERNATIONAL SUBMARINE ENGINEERING LTD (ISE)WWW.ISE.BC.CA | info@ise.bc.ca**DORADO AND DOLPHIN USV**

The Dorado USV, and its smaller predecessor Dolphin, are actively stabilized semi-submersible USVs for MCM, route survey, and AUV supervision operations. This platform is highly stable even in extreme sea states and is capable of operating in both piloted and fully autonomous modes with long standoff. The Dorado is equipped with a keel winch and tow cable up to 400m, and a dock for a towfish such as the ISE Aurora. Dorado can survey and tow at up to 12 knots due to its powerful diesel engine. (Customizable)



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IXBLUEWWW.IXBLUE.COM

Guillaume Eudeline | guillaume.eudeline@ixblue.com

**DRIX**

DriX has been operating with major Energy and Survey companies (operators and contractors) for over a year. DriX can conduct operations with a reduced crew. Fitted with an iXblue autopilot, a Collision Avoidance System and HSE compliant, it can operate on windfarms or within rigs 500 yards exclusion zones. Its endurance ranges from 24 hours at 14 knots (top speed), to 10 days at 4 knots. Its highly hydrodynamic shape allows DriX to conduct surveys up to sea state 5. Its Launch&Recovery System (DDS), fully automatic, allows for swift and safe deployments. (Customizable)



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KONGSBERGWWW.KM.KONGSBERG.COM

Sales | km.sales@km.kongsberg.com

**KONGSBERG SOUNDER USV**

The award-winning KONGSBERG Sounder USV system is a multi-purpose unmanned surface vehicle system with a unique hull design to ensure high performance for hydroacoustic applications. (Customizable)



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L3HARRISWWW.L3HARRIS.COM

James Cowles | James.Cowles@L3Harris.com

**C-CAT 3**

The C-Cat 3 is a robust and easy to use ASV ideally suited to shallow water operations in inshore and coastal environments. The vehicle has a manually deployable keel and is capable of housing multiple standard sensors such as a USBL and MBES. (Customizable)



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**C-WORKER 4**

The C-Worker 4 is a robust and capable ASV ideally suited to inshore and coastal survey. C-Worker 4 is a stable platform with a large payload capacity. Its 48 hour endurance and efficient fuel consumption of less than 2.5 litres of diesel an hour make it an ideal replacement for traditional survey vessels. (Customizable)



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**C-WORKER 5**

The C-Worker 5 is the ideal solution to increasing survey coverage in limited timeframes. A proven offshore survey "force-multiplier", the vehicle can operate for up to 7 days at survey speeds up to 7 knots. (Customizable)



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**C-WORKER 7**

The C-Worker 7 is a robust, offshore work-class ASV. Ideally suited for inspection and positioning applications, C-Worker 7 can negate the need for ships on station or seabed anchoring. Its 2.5m x 1m moon pool allows for easy integration of standard or custom payloads via an interchangeable frame. (Customizable)



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**C-TARGET 6**

C-Targets are a range of lightweight, easily deployed, highly manoeuvrable marine targets used for naval gunnery training, weapons testing and ship command and control assessments. C-Target 6 is a high-speed vehicle capable of acting as a direct fire target or as a tow boat for inflatable targets. (Customizable)



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L3HARRIS

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**C-TARGET 9**

C-Targets are a range of lightweight, easily deployed, highly manoeuvrable marine targets used for naval gunnery training, weapons testing and ship command and control assessments. C-Target 9 is a high-speed vehicle capable of acting as a direct fire target or as a tow boat for inflatable targets. (Customizable)



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**C-TARGET 13**

C-Targets are a range of lightweight, easily deployed, highly manoeuvrable marine targets used for naval gunnery training, weapons testing and ship command and control assessments. C-Target 13 is a high-speed vehicle capable of acting as a direct fire target or as a tow boat for inflatable targets. (Customizable)



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LIQUID ROBOTICS - A BOEING COMPANY

WWW.LIQUID-ROBOTICS.COM

Sales | sales@liquid-robotics.com

**WAVE GLIDER**

Liquid Robotics designs and manufactures Wave Gliders, the first wave, and solar-powered unmanned ocean robots. With our partners, we address many of the planet's greatest challenges, by transforming how to assess, monitor, and protect the ocean. Visit www.liquid-robotics.com to learn more. Liquid Robotics is a subsidiary of Boeing. (Customizable)



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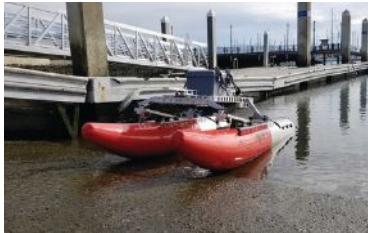
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WWW.WAM-V.COM | Marine Survey Department | sales@wam-v.com

**WAM-V 8 ASV**

The WAM-V 8 provides best-in-class stability where it counts. Head out with the confidence you need to get the job done. The WAM-V 8 has best-in-class portability. Disassemble and pack it into shipping cases that can be checked on most US domestic airline carriers.

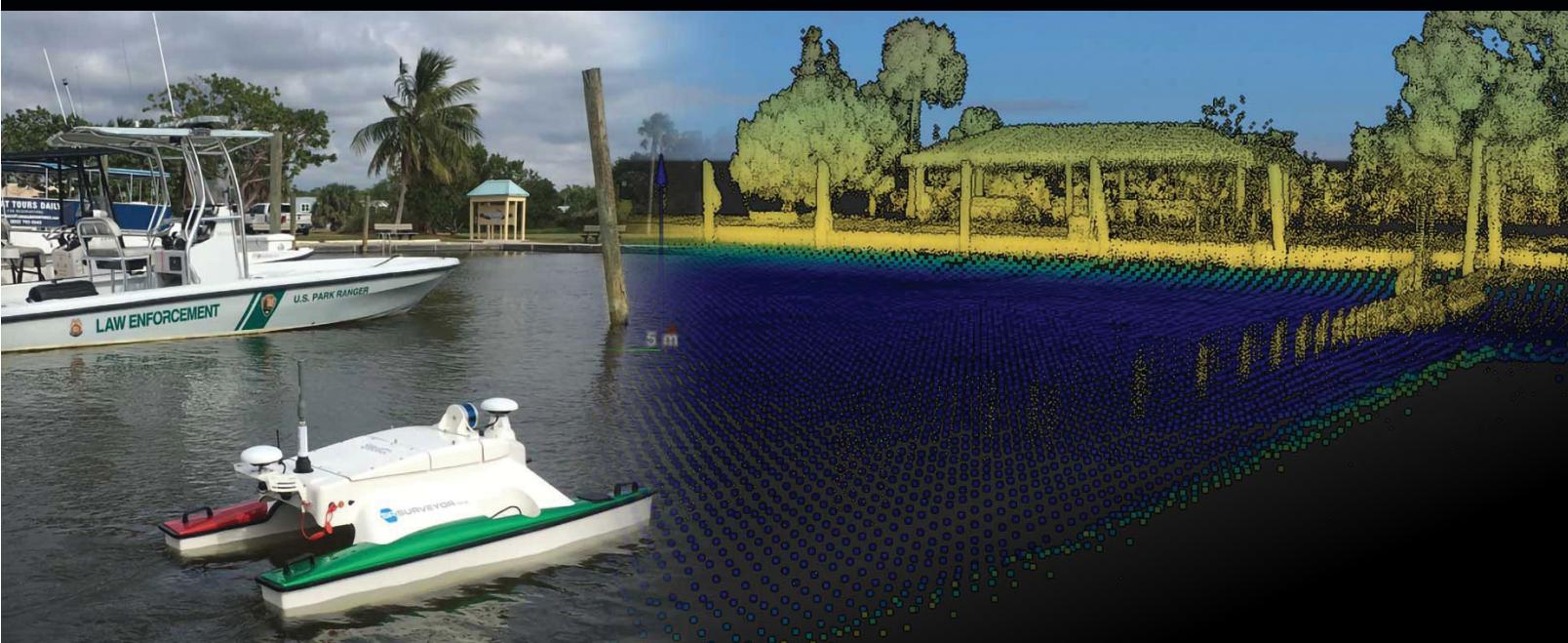
**16' WAM-V USV**

The WAM-V 16 has best-in-class portability. Transport it by trailer, or ship it using standard air freight. Launch it from the deck of a larger vessel, or assemble and launch it from shore. Able to launch and recover aerial and subsurface unmanned and autonomous systems from the stabilized central payload area. Increases the number of applications/missions from a single autonomous surface vessel.

**WAM-V 22 ASV**

The WAM-V is the most maneuverable ASV available. Able to turn 360 degrees in its own length, the WAM-V makes quick speed and course corrections, allowing it to have the best on track performance on the market. The WAM-V 22 is the ideal ASV (Autonomous Surface Vehicle) for larger marine data collection projects — as a primary survey instrument or as a force multiplier for existing vessels. The WAM-V 22 can be quickly assembled and deployed by two people. Launch and recover from shore or a vessel deck, or by trailer.





Intelligent Marine Robotics

Solutions that put you in control



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ROVs for Hull & Tank Cleaning



Engineering & Design



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We engineer and manufacture unmanned systems for an increasingly data-centric world.

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MARINE TECH SAS

EN.MARINETECH.FR | Magali Mouries | m.mouries@marinetech.fr

**RSV**

The RSV is a reliable solution able to carry out remote missions, with up to 48h endurance. It can be equipped with multiple sensors and ROV for: SURVEY - detection, geophysical survey, subsea works monitoring. SURVEILLANCE/SECURITY - inspection, data acquisition in hostile environment. Main specifications: Long range control, real time data transfer up to 20km, obstacle avoidance. Models: from 2,50m to 5,20m length. (Customizable)



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**RSV DOLPHIN**

The RSV Dolphin is a compact USV, dedicated to marine survey and site surveillance. Composed of 3 modules of 30 kg each (control command and electronic, hull, engines), the RSV Dolphin is easy to transport and deploy, with 6 hours endurance and up to 10 knots speed. (Customizable)



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**RSV ORCA**

The RSV Orca is designed for open sea marine survey and surveillance missions. Its rugged design and stability allow the RSV to achieve missions in up to 1.5m swell and 35 knots wind. Data recorded by sensors onboard are transmitted in real time to the operator to a control command base and positioning is provided by high precision GPS, gyrocompass and motion sensor. (Customizable)



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**RSV SEA OBSERVER**

The RSV Sea Observer is the first USV capable of deploying inspection and work class ROV for offshore operations, such as subsea monitoring, inspection, etc. It can be equipped with MBES, SSS, SBES, etc. for marine survey. A compact version of the RSV Sea Observer is also made available. (Customizable)



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MARITIME ROBOTICS

WWW.MARITIMEROBOTICS.COM

Sales | sales@maritimerobotics.com

**MARINER**

The Mariner USV is a multipurpose unmanned vehicle with hull and superstructure made of polyethylene. The vehicle will fit into a standard 20 feet container for easy cargo shipping. The Mariner is equipped with a large payload room of more than one cubic meter and can be equipped with a variety of surface and sub-surface sensors/payload types.



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**OTTER**

The Otter Unmanned Surface Vehicle (USV) is an easily deployable and portable USV, which provides a cost-effective turn-key solution for bathymetric surveys in sheltered waters.



OBS | SUR

MARTAC

WWW.MARTACSYSTEMS.COM

info@martacsystems.com



MANTAS USV

Unique class of next generation unmanned vessels. The MANTAS unmanned surface and hybrid vessels are accompanied with a robust Command and Control (C2) system known as TASKER. The MANTAS USV enables the coverage of open ocean and littoral waterways with extended on-station persistence capability. (Customizable)



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NAVOCEAN INC.

WWW.NAVOCEAN.COM

Stuart Lochner | sales@navocean.com



NAV2 SAIL AND SOLAR ASV FOR DATA COLLECTION

Made for ocean data collection, the Nav2 Self-Navigating Sailboat provides average speeds of 2 knots, continuous communications, and is built for open ocean, coastal and freshwater surveys. At only 2 meters and 85 pounds, the Nav2 is easy to launch and land from shorelines, docks or boats. (Customizable)



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OCEAN AERO

WWW.OCEANAERO.COM

Keith Blystone | info@oceanaero.com



TRITON

TRITON is the world's first and only autonomous environmentally powered ocean vehicle that sails and submerges for long-range, persistent ocean observation and data collection missions, providing intelligence gathering in some of the hardest-to-reach-places on the planet. Triton can be configured to carry a variety of payloads to complete any mission. (Customizable)



OBS | SUR | A&T | VC&L | NDT

OCEANALPHA

WWW.OCEANALPHA.COM | Sales | Sales@oceanalpha.com



M40P LONG ENDURANCE MULTI-FUNCTION USV

M40P is a multi-purpose surveying unmanned surface vessel (USV) platform for estuary, on-shore, and off-shore applications. It's designed to facilitate efficient data acquisition for construction planning and routine maintenance in the field of offshore wind farms and oil and gas exploration.



OBS | SUR | VC&L | A&T

ME120 DETACHABLE HYDROGRAPHIC USV

ME120 utilizes a detachable catamaran design, making it easy for van transportation and for two people to assemble and disassemble. The 2.5m USV is dedicated for MBES, SBES and other relatively smaller-size instruments. The Kongsberg M3 MBES is a highly recommended payload which has gone through series of testing and proved to be a highly mature and reliable solution. The payload cabin is replaceable so user can freely change and install different instruments according to mission requirements.



OBS | SUR | VC&L | A&T

SL20 AUTONOMOUS HYDROGRAPHIC SURVEY USV

SL20 is a compact and portable unmanned surface vessel (USV) for hydrographic and bathymetric surveys. Its moon pool supports flexible deployment of different instruments, including ADCP and echo-sounders. Made from carbon fibre, the 1m SL20 weighs 17 kg, and can be easily operated and transported by one person. Its powerful battery and low power consumption ensures 6 hours of endurance while sailing in 3 knots.



SUR | VC&L | A&T

TASKS

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SUR SURVEY

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VSK VEHICLE STATION KEEPING

WT WORK TOOLS

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OCEANALPHA

WWW.OCEANALPHA.COM

Sales | Sales@oceanalpha.com



SL40 AUTONOMOUS HYDROGRAPHIC SURVEY USV

SL40 is a waterjet-propelled unmanned surface vessel (USV) dedicated for hydrographic and bathymetric surveys. The 1.6m USV weighs 35kg and can carry 15kg of survey instrumentation including ADCP, water sonde, SBES, MBES or side scan sonar. The USV comes with obstacle avoidance system and RTK, and can be controlled by either a base station or a remote control. In March 2020, the Port of Hamburg introduced an SL40 USV to its Hydrographic Department for routine bathymetric survey. (Customizable)



OBS | SUR | VC&L | NDT | A&T

OPEN OCEAN ROBOTICS

WWW.OPENOCEANROBOTICS.COM

info@openoceanrobotics.com



FORCE12 XPLORER

Force 12 Xplorer is an autonomous sailboat that uses the wind to move and solar energy to power its computers and sensors. Powered by entirely renewable energy sources, it can travel on the ocean for months at a time collecting ocean and environmental data using its suite of sensors. It sends that information back in real-time through secure communication systems and clients can control the USV from anywhere in the world using our user portal.



OBS

OFFSHORE SENSING AS

WWW.SAILBUOY.NO

David Peddie | info@sailbuoy.no



THE SAILBUOY

The Sailbuoy is a field proven, long endurance ocean USV. Wind and solar powered Sailbuoys perform a variety of missions, from fish and algae detection to wind and wave observations. At 2 metres long it is easily handled by two people and the satellite communication provides real-time ocean data. (Customizable)



OBS | A&T

OPEN OCEAN ROBOTICS

WWW.OPENOCEANROBOTICS.COM

info@openoceanrobotics.com



DATA XPLORER

Data Xplorer is a solar powered ocean drone, also called an uncrewed surface vehicle (USV). Powered by the sun, it can travel on the ocean for months at a time collecting ocean and environmental data using its suite of sensors. It sends this information back in real-time through secure communication systems and clients can control the USV from anywhere in the world using our user portal. Capable of travelling in both coastal and open-ocean waters, and with a customizable platform for multiple sensor integration, it offers the ability to understand our oceans in a whole new way. Data Xplorer is designed to endure all sea states and is self righting.



OBS

POWERVISION

WWW.POWERVISION.ME/EN

POWERDOLPHIN

Equipped with a unique dual-joint rotating camera whose shooting angle is as wide as 132°, PowerDolphin can rotate to meet the above-water and underwater shooting demands, with the field of view ranging from -150° to +70° (the horizontal position is 0°, and when the camera rotates towards the underwater areas, the angle becomes negative), offering you a brand-new 220° shooting angle and visual experience.





INDUSTRY 4.0 DIGITAL TWIN SUPPORT FOR A NET ZERO EMISSIONS FUTURE SOONER

The Net Zero Emission future imperative has driven the vision for crewless energy production projects utilizing remote monitoring and operations with resident, autonomous inspection and maintenance vehicles, renewable energy and artificial intelligence, and smaller vessels at sea for shorter periods.

Digital twin approaches such as simulation, visualization and integration of technologies in virtual environments create safer, more efficient, low carbon modes of testing and verification of such innovations.

GRI is responding with a selection of field-tested software applications to provide physics and data-driven virtual sandboxes that support collaboration among offshore operators, data provision and analytics, and platform and instrument innovators.

Simulating Solutions

VROV, GRI's real-time marine operations simulator, has an extremely powerful and stable dynamics core and has been employed for decades in pilot training and competency assurance programs. More and more, surface and subsea robotics manufacturers have been

using VROV to develop virtual robotic systems in digital twins of generic testbeds and real-world offshore facilities.

"At HonuWorx we're developing the next generation of autonomous subsea robotics and have learned through decades of work in the field that a high-fidelity simulator is critical to delivering complex systems quickly and efficiently. We're leveraging the GRI VROV simulation platform on both our Ridley and Loggerhead development programs to great effect; the VROV model accuracy and the ability to easily modify system and environmental parameters has allowed us to move fast, optimize our design stages and ultimately drive down the risk inherent in complex systems." – Chris Sotzing, Head of Digital Technology and Solutions, HonuWorx (www.honu-x.com).

Winning with Twinning

GRI's iDEA-DT (Digital Twin) software was developed to support complex offshore energy projects by providing a common interface for the visualization of numerous types of supporting environmental, engineering, and operational data. iDEA-DT uses an expanded set of Industry 4.0 compliant user interface

features to facilitate the design, maintenance and operation of industrial assets and visualization of their associated digital twin data.

One example is "Copsys Intelligent Digital Skin (CIDS)—a revolutionary new paint-based technology that permits digital remote sensing of coating integrity and advanced corrosion prevention of protected surfaces. Seeing is believing, and iDEA DT delivers real time visualization of CIDS actionable intelligence to decision makers anywhere in the world." – Michael Maguire, Co-Founder, Copsys Technologies Inc. (www.copsys.ca).

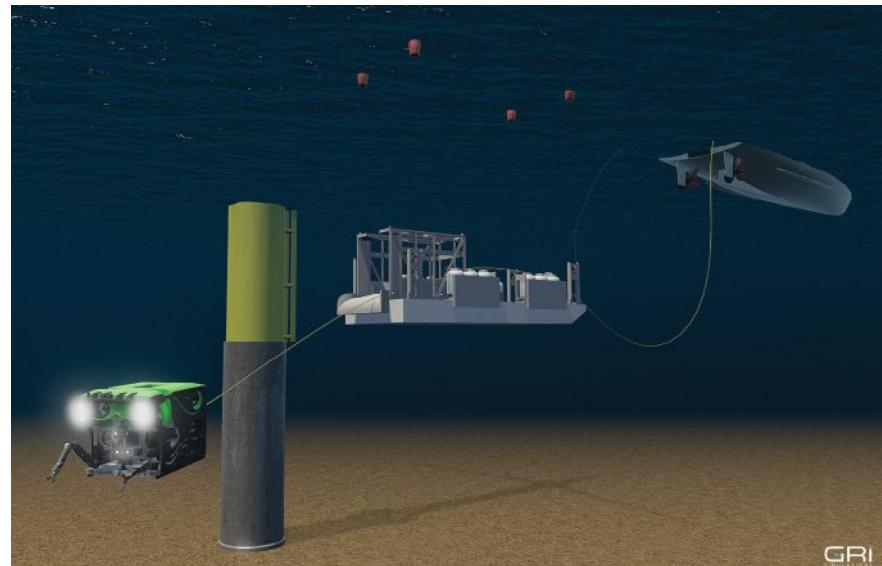
Similarly, a subsea asset registering a low-pressure alarm would create a signal for a seabed resident drone or ROV to navigate to a particular location and deploy the appropriate sensor payload to collect additional information about the incident.

Achieving a Net Zero future is a huge undertaking that demands global collaboration between entities both large and small, and we'd love to hear from innovators who might like to work with us as part of the solution.

For more information, visit: www.grisim.com.



» Real-time digital twin visualization of damage registered on a specific section of CIDS pipe with an aerial drone responding autonomously to perform visual inspection of the asset. (Image credit: GRI)



» The towed Ridley deployment system being developed by HonuWorx promises to reduce the reliance on large crewed vessels for deploying intervention class ROVs. (Image credit: GRI)

POWERVISIONWWW.POWERVISION.ME/EN**POWERRAY**

PowerRay's integrated 4K UHD camera allows filmmakers to shoot underwater content for movies, research, and creative underwater photography. Take control of PowerRay and explore the underwater world!



OBS

ROBOTICS INDUSTRY (R&DRONE)WWW.ROBOTICS-INDUSTRY.COM**DRONEO**

This unmanned surface vehicle (USV) is designed to realize inspection missions and take environmental samples. Droneo is able to carry several types of bathymetric, physico-chemical and hydro-sedimentary monitoring sensors. With 10 hours of autonomy, Droneo can operate over a very wide area. This data acquisition tool is easy to operate and very accessible. It allows the making of more frequent measurements and to improve the quality and accuracy of analyses.



SUR | OBS

SAILDRONEWWW.SAILDRONE.COM**SAILDRONE**

Saildrone combines wind-powered propulsion technology and solar-powered meteorological and oceanographic sensors to perform autonomous long-range data collection missions in the harshest ocean environments. Saildrone missions are executed as a fully managed service from start to finish: We handle the transport of the saildrone to the area of operations, launch and retrieve the USV, and deliver high-resolution data in real-time and raw data post-mission.



SUR | OBS

SEA-KIT INTERNATIONALWWW.SEA-KIT.COM | James Hopper | hopper@sea-kit.com**SEA-KIT H CLASS USV**

The H-class features a composite hull for higher transit speeds, giving it greater range and endurance, as well as active stabilisers to minimise roll. The new design has 12m and 15m variants, with the 12m version transportable in a standard shipping container for rapid, low-cost deployment. Both variants can be davit launched.



OBS | SUR | VC&L | A&T

**SEA-KIT X CLASS USV**

SEA-KIT X is a remotely controlled, versatile and configurable USV platform that can launch and recover remote vehicles, enabling missions including deep-water bathymetry, offshore and subsea asset inspection and hydrographic survey with reduced risk to personnel, significantly decreased costs and lower environmental impact. The SEA-KIT X class design holds Unmanned Marine Systems certification from Lloyd's Register.



OBS | SUR | VC&L | A&T

SEAFLOOR SYSTEMS, INC.WWW.SEAFLOORSYSTEMS.COMJosh Grava | info@seafloorsystems.com**SEAFLOOR UNMANNED & AUTONOMOUS VESSELS**

Seafloor has been building Unmanned Surface Vessels (USVs) for over a decade. We lead the market with dynamic platforms that extend the capabilities of traditional survey equipment, enabling surveyors to remotely analyze otherwise challenging environments. Applications include inspection and survey of mines, sewage treatment plants, contaminated lakes, and rivers. Both remotely controlled and autonomous navigation suites available. Check out our turn-key USV platforms to efficiently conduct missions on water, reduce time spent in the field, and save on labor costs. (Customizable)



OBS | SUR | VC&L | A&T

SEAROBOTICS CORPORATION

WWW.SEAROBOTICS.COM | info@searobotics.com



SR-CYBERHELM SYSTEMS

Autonomous conversion made simple. Our SR CyberHelm options put you in control of your ASV design and build. Whether you wish to retrofit an existing marine asset or incorporate one of our packages into a new vessel, we have the on-staff engineering expertise and fabrication resources to ensure seamless integration and interfacing. (Customizable)



OBS | SUR | INS



SR-ENDURANCE 7.0

SR-Endurance 7.0—is a aluminum workboat class multi-mission ASV, suitable for a range of coastal and offshore operations. The SR-Endurance 7.0 has diesel-electric hybrid propulsion, an automated A-frame boom type launch and recovery system (LARS) and can be operated as a manned or unmanned vessel. The level of autonomy can be configured per mission. (Customizable)



OBS | SUR | INS | NDT | A&T



SR-ENDURANCE 8.0

The SR-Endurance 8.0 model features an exclusive hydrographic winch coupled with a simple A-Frame over-boarding assembly, including an instrumented over boarding sheave capable of launching and recovering additional ride-on assets, such as ROVs. The system is equipped to deploy various towed instruments, or 100 kg deployable payloads. (Customizable)



OBS | SUR | INS | NDT | A&T



HYCAT

Integrated series of customizable plug-and-play sensors, making it one of the most versatile tools for water quality survey on the market. The HYCAT is SUV-portable and easy to launch, with no ramp or dock access required. Ideal for water quality studies, bathymetry, water velocity, remote data acquisition, and depth measurement.

(Customizable)



OBS | SUR | INS | NDT | A&T

SEAROBOTICS CORPORATION

WWW.SEAROBOTICS.COM | info@searobotics.com



SR-SURVEYOR M1.8

The integrated MBES allows surveyors to cover large swath width hydrographic survey data more efficiently and capture a 360-degree view of all data points. Central to the design is a Velodyne Puck LiDAR for terrestrial mapping, a distinct advantage when inspecting coastal infrastructure, such as near-shore pipelines or surveying bridges, offshore rigs. (Customizable)



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SEAROBOTICS CORPORATION

WWW.SEAROBOTICS.COM | info@searobotics.com

**SR-UTILITY 2.5**

While compact (2.5m in length), the SR-Utility 2.5 is a comprehensive hydrographic system which features multibeam, echo sounders, support sensors, as well as an SV cast winch, deployment cart and road trailer. (Customizable)



OBS | SUR | INS | NDT | A&T

**SR-UTILITY 3.0**

The 3.0 was originally designed as a Heavy Load Water Sampling ASV in 2019 but has been developed to carry an interchangeable suite of customizable sensors and payloads. We call it our "Pick-Up Truck" ASV given its versatility and durability. (Customizable)



OBS | SUR | INS | NDT | A&T

**SR-UTILITY 3.6**

The SR-Utility 3.6 is a collapsible, multifunctional ASV that offers large vessel capabilities in a package that is easily transported and stored (in two standard 65" pallet containers). This vehicle is designed specifically to support large multibeam sonar systems and is available with an optional autonomous sound velocity cast winch. (Customizable)



OBS | SUR | INS | NDT | A&T

SEATRAC SYSTEMS, INC.

WWW.SEATRAC.COM

Sales | sales@seatrac.com

**SEATRAC SP-48**

The SP-48 is a persistent solar powered USV used to perform real-time data collection and communications in all marine environments for scientific, commercial and defense applications. With its large power and payload capacity, the SP-48 can be customized with best-in-class combinations of payloads including high-powered sensors during any one mission. (Customizable)



SUR | OBS | VC&L | A&T

SUBSEASAIL LLC

WWW.SUBSEASAIL.COM

Michael Jones | mbjones@subseasail.com

**GEN7 MONOHULL OBSERVATION VESSEL & RIGID PAM ARRAYS**

San Diego-based SubSeaSail is developing affordable, autonomous, 100% energy harvesting, long-duration, submerging sailing platforms & sensors. SSS has three lines of business: 1) monohull, semi-submersible observation vessels; 2) multi-hull, surface cargo vessels; 3) unique sensors ideally suited for these vessels including rigid Passive Acoustic Monitoring (PAM) Arrays & weather station. (Customizable)



OBS | A&T

SUBSEA TECH

WWW.SUBSEA-TECH.COM

Sales | st.sales@subsea-tech.com

**CAT-SURVEYOR**

CAT-Surveyor is a teleoperated or autonomous USV allowing acquisition of hydrographic data or surveillance for inland waters, harbour and coastal areas. High payload capacity (80kg) allows embedding multiple sensors for scientific, defense and civil missions. CAT-Surveyor was the first USV able to launch a mini-ROV. (Customizable)



SUR | OBS | VC&L | A&T

SUBSEA TECH

WWW.SUBSEA-TECH.COM | Sales | st.sales@subsea-tech.com



CATAROB

Catarob has been especially designed to carry out tele-operated or autonomous inspection, survey and modelling missions in shallow inland waters and harbour areas. Lightweight and compact (50kg, L180 cm), Catarob is easily transported and deployed by a single operator. Open architecture and high speed PC to PC communication allow integrating multiple sensors. (Customizable)



SUR | OBS | VC&L | A&T



SEACAT

The SeaCAT USV is a sea going catamaran type drone designed for automatic or remotely controlled inspection and survey missions on offshore infrastructures. SeaCAT offers an innovative multi-drone platform by supporting an ROV and a UAV to carry out inspection below and above water with a single control interface. (Customizable)



SUR | OBS

TELEDYNE OCEANSCIENCE

WWW.TELEDYNEMARINE.COM

Sales | Oceanscience.Sales@Teledyne.com



Q-BOAT 1250

Teledyne Oceanscience Q-Boats® are the number one choice for reliable remotely-controlled data collection in streams, rivers, lakes and coastal waters. The new Q-Boat 1250 has been designed specifically for shallow water flow and discharge measurements. This one-man portable remote vehicle is easy to set up, easy to operate, and accepts most industry standard ADCPs. (Customizable)



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TELEDYNE OCEANSCIENCE

WWW.TELEDYNEMARINE.COM | Sales | Oceanscience.Sales@Teledyne.com



Q-BOAT 1800

The Teledyne Oceanscience Q-Boat® 1800 with ruggedized design and interchangeable sensor well, offers an entirely new option for high-resolution shallow-water hydrographic surveying. The boat offers multibeam bathymetry data where conventional methods are not feasible or safe, and helps avoid mobilizing a workboat or vessel of opportunity. (Customizable)



SUR | A&T



Z-BOAT 1250

The Z-Boat 1250 is easy to operate. The integrated echosounder and lightweight, resilient ABS hulls make the Z-Boat 1250 convenient for a single operator. At under 50 pounds fully outfitted with instrumentation, the unit is easily single person portable. (Customizable)



SUR | NDT | A&T



Z-BOAT 1800

The Teledyne Oceanscience Z-Boat® 1800 with ruggedized design and interchangeable sensor well, offers an entirely new option for high-resolution shallow-water hydrographic surveying. The boat offers multibeam bathymetry data where conventional methods are not feasible or safe, and helps avoid mobilizing a workboat or vessel of opportunity. (Customizable)



SUR | NDT | A&T



Z-BOAT 1800 - TRIMBLE EDITION

The Teledyne Z-Boat 1800-T, is a high-resolution shallow water hydrographic unmanned survey vehicle created in collaboration with Trimble Marine Construction. (Customizable)



SUR | NDT | A&T

UNMANNED SURVEY SOLUTIONS

WWW.UNMANNEDSURVEYSOLUTIONS.COM | James Williams | info@unmannedsurveysolutions.com

**ACCESSION USV**

The Unmanned Survey Solutions (USS) Accession Class Unmanned Surface Vessel (USV) is designed by surveyors, for surveyors. The modular design allows for base boat length of 3.50m to extend to 4.25m or 5.00m by adding additional hull sections. Payload agnostic and fully customer configurable the Accession USV offers unrivalled versatility for coastal and offshore deployments. (Customizable)



OBS | SUR | VC&L | A&T

**INCEPTION MKI USV**

The Unmanned Survey Solutions (USS) Inception Class MK 1 Unmanned Survey Vessel (USV) has been developed to meet the demanding requirements of the shallow water sector. This hydrographic survey vessel is composed of tough aluminium hulls, weed cutting propellers and equipment to provide bathymetric surveys in areas using single beam sonars where access for a traditional survey vessel is restricted. (Customizable)



OBS | SUR | VC&L | A&T

**INCEPTION MKII USV**

The Unmanned Survey Solutions (USS) Inception Class MK II Unmanned Surface Vessel (USV) is designed by surveyors, for surveyors. This modular, versatile and robust USV is composed of tough aluminium hulls, weed cutting propellers and a modular payload pod for housing various sonar and environmental sensors. The design concept of the Inception MK II is modular from the internal electronics to the main vessel components. (Customizable)



OBS | SUR | VC&L | A&T

XOCEANWWW.XOCEAN.COM
Sales | sales@xocean.com**XO-450 UNMANNED SURFACE VESSEL**

XOCEAN's USVs offer full unmanned Over The Horizon operations using satellite communications. Each USV sends real time images and situational awareness data to XOCEAN's Operations Centre where a team of qualified USV Pilots keep watch and control the vessels 24/7. XOCEAN's USV Pilots are responsible for collision avoidance.



SUR | OBS

YSI INTEGRATED SYSTEMS & SERVICES

WWW.YSI.COM | ysi.systems@xyleminc.com

**HYCAT - AUTONOMOUS SURFACE VEHICLE**

The HYCAT Autonomous Surface Vehicle (ASV) is the newest element in the Xylem brand Autonomous and Remote Vehicle Monitoring Solutions. This unique ASV combines products from multiple brands to provide a total solution for your site. Sensors have plug-and-play capabilities, allowing the HYCAT to be customized to your specific site needs. (Customizable)



SUR | OBS | NDT | A&T

**RQPOD REMOTE SURFACE WATER VEHICLE**

The YSI rQPOD is a lightweight, easy-to-assemble propulsion system that can fit to many board-style platforms. It allows users to collect data over a large spatial area in minutes, and in areas otherwise inaccessible. The 2.4 GHz remote control allows operators to control the system from up to 250 meters with a clear line of sight, with real-time data visualization options that allow users to make mission changes and decisions on the spot. (Customizable)



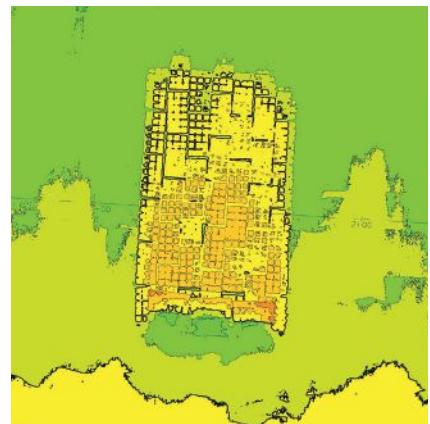
SUR | OBS | NDT | A&T



HELPING MAKE SHORE

From major coastal restoration projects to beach monitoring, Morgan & Eklund has been providing government and commercial partners with multi-disciplinary surveys for over 35 years. Whether for artificial reef construction or ongoing dune nourishment, Morgan & Eklund is equipped to manage the pre-, during, and post-implementation survey and monitoring program using the latest breakthrough technology and software.

Discover more about M&E's hydrographic, topographic, and GPS survey capabilities, and our computer-aided drafting services.



📞 (772) 388-5364

🌐 www.morganeklund.com

📍 Florida locations: Vero Beach, Boca Raton,
and PortMiami





» The multi-sensor Slocum AUV provides tremendous capability and endurance. (Photo credit: Teledyne Marine)

OUR PASSION RUNS DEEP

At Teledyne Marine we provide innovative technical solutions which enable our partners to explore, preserve, and protect our world. As part of Teledyne Technologies Incorporated (TDY), Teledyne Marine is a market leader in Imaging, Instruments, Interconnect, Seismic, and Vehicle technologies by providing innovative and highly reliable total solutions to our customers. Teledyne Marine is committed to providing premium products backed by a dedicated service and support team.

BREADTH AND EXPERIENCE

At Teledyne Marine, our products cover the SeaFloor to the Surface. Our marine vehicles are well suited for many challenging applications including defense and security, oceanographic observation and measurement, marine life monitoring and identification, infrastructure survey and inspection, and offshore energy including renewables.

At Teledyne, we work with our customers to provide tailored solutions to meet unique needs. Our products are designed to be modular and configurable and can accommodate a vast array of sensor and instrument options. We have standard vehicle designs tailored for general tasks and custom vehicles aimed at meeting very unique requirements. At Teledyne Marine we have over 50 years of experience in underwater systems with original brands Benthos, Webb Research, Gavia, Ocean Science, and SeaBotix.

AUVs / GLIDERS / FLOATS

Teledyne's suite of Autonomous Underwater Vehicles (AUVs) has demonstrated outstanding success with academic, commercial and government customers

worldwide. Teledyne has just produced its 1,000th Slocum Glider. The Slocum provides tremendous capability and endurance with very low logistics. Slocum gliders host many sensor platforms for applications ranging from water column measurements to hurricane intensity forecasting, to passive acoustic monitoring.

Our fleet of AUVs includes the truly modular 8" diameter AUV, the Gavia, which is perfectly suited for a wide variety of tasks including

bathymetric survey, object identification and inspection, and pipeline tracking. Our newest AUV, the 12" Osprey is the vehicle of choice for longer duration, higher power missions to include high resolution surveys, and mine countermeasure work in deeper water. The Gavia SeaRaptor is our 6,000 m depth rated vehicle well suited for survey and inspection work in the harshest environments.

Finally, our Advanced Profiling EXplorers (APEX) have helped contribute to world ocean and climate models leading to a better understanding of the changing world around us. Teledyne just celebrated the 10,000 profiling float!

USVs

Teledyne's very capable Uncrewed Surface Vehicles (USVs) provide better insight into the world above, and below, the water line. Our 1800 and 1250 surface boats carry a wide variety of sensor packages to survey, inspect, monitor, and measure the world around.

ROVs

Our SeaBotix brand carries with it a rich tradition and history of excellence in a small inspection class vehicle. SeaBotix was one of the first companies to demonstrate the power of a compact all electric vehicle for performing complex tasks. We continue that tradition with our new vLBV, the Mark II.

Whatever your task, Teledyne Marine has innovative marine vehicles to help you solve complex problems.

For more information, visit:
www.teledynehmarine.com.



» Teledyne's 1800 and 1250 USVs support a wide variety of sensor packages optimized to survey, inspect, and monitor. (Photo credit: Teledyne Marine)

GLIDERS & PROFILERS

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VEHICLE
BUYERS' GUIDE



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OFFSHORE OIL & GAS



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ALSEAMAR

WWW.ALSEAMAR-ALCEN.COM
Romain Tricarico | tricarico@alseamar-alcen.com



SEAEXPLORER

The SeaExplorer is the ultimate low-logistics and user-friendly glider designed for Oceanographic, Defence and Oil&Gas applications. Its rechargeable battery and its fully interchangeable payloads greatly simplify its maintenance, allowing huge savings in terms of time and money, making it the glider with the lowest cost of ownership on the market. (Customizable)



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HUNTINGTON INGALLS INDUSTRIES

WWW.HYDROID.COM
Tom Reynolds | sales@hydroid.com



SEAGLIDER M1

The Seaglider M1 is a 1000 meter depth rated glider that uses changes in buoyancy to move through the water column in a sawtooth pattern while collecting data. This mature technology has revolutionized the way ocean data is collected, allowing extremely long duration monitoring up to 10+ months. (Customizable)



OBS | SUR | A&T

DEL MAR OCEANOGRAPHIC

WWW.DELMAROCEAN.COM
Chris Kontois | chris@delmarocean.com



WIREWALKER

The Wirewalker is a vertically profiling instrumentation-platform, powered by ocean waves. Through the Wirewalker's rapid profiling and ability to integrate a wide variety of sensor payloads, it brings new life to typical one-dimensional sensor time-series as a 2-D depth-time image where an enormous increase in information and intuition is achieved. (Customizable)



OBS | A&T | NDT

EXOCETUS AUTONOMOUS SYSTEMS

WWW.EXOCETUSSYSTEMS.COM
Joe Turner | turner@exocetussystems.com



MOD2 GLIDER

The MOD2 Glider™ is the next step forward in long duration subsea monitoring. Designed for the user, the glider can be easily configured, features a large sensor bay, and runs open software that can support both off-the-shelf and custom sensors. The powerful engine autonomously transitions through fresh and salt water. (Customizable)



OBS | SUR | VC&L | A&T

TELEDYNE WEBB RESEARCH

WWW.TELEDYNEMARINE.COM
Chris DeColibus | webbresearch@teledyne.com



SLOCUM G3 GLIDER

The Slocum glider is a buoyancy driven AUV which enables long endurance remote water column observation for academic, military, and commercial applications. Slocum gliders are modular, allowing for a variety of sensor and payload options for oceanographic observations. Over 60 sensors and other options are available to address a wide variety of ocean conditions and sampling requirements. (Customizable)



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EVOLOGICS US ROADSHOW 2022



» The 2022 US Roadshow gave the EvoLogics team an opportunity to demonstrate the company's expanding ecosystem of smart ocean technology, including the highly portable Sonobot 5 USV, pictured left and right. (Photo credits: EvoLogics)

In June 2022, EvoLogics from Berlin, Germany, embarked on its first ever "roadshow" initiative, taking the company's underwater communication, positioning, and robotic solutions on a demonstration tour across eight locations in the United States.

The team's tour of both the East and West coasts was to present—with live demonstrations—the capabilities of EvoLogics' underwater acoustic modems, USBL and LBL positioning systems, as well as the company's surface and underwater vehicles to industry partners.

The lineup for the roadshow included the company's Sonobot 5, a highly portable and easy to maneuver uncrewed surface vehicle (USV) for marine survey and search and rescue operations; a USBL buoy, an "unfold and deploy" all-in-one unit for USBL positioning; and Quadroin, the penguin-shape-inspired autonomous underwater vehicle (AUV).

SONOBOT 5 USV

Sonobot 5 is EvoLogics latest USV model. The compact unit fits into a car trunk and can be deployed by a single operator—as EvoLogics demonstrated during the tour.

The vehicle can be outfitted with a range of sensors (single- or multibeam echosounder, side-scan sonar, front-facing camera etc.), WLAN and cellular communications, and a selection of GNSS options.

EvoLogics recently added an exciting new feature for the Sonobot platform—real-time object recognition. The AI-based system runs

directly onboard the vehicle and analyzes raw side-scan sonar output to detect and visually highlight various objects in the operator's control software.

A cloud-based ecosystem around the new feature provides users with regular updates and new detectable object classes. Sonobot-enabled object recognition is already in active use by Dutch Water Police in NL, with more customers in onboarding to make use of this feature.

USBL BUOY

The USBL buoy is a fully integrated device, first introduced by EvoLogics in late 2020. The buoy is an all-in-one solution for ultra-short baseline (USBL) positioning of underwater targets where position fixes are obtained from ranges and angles estimated by the USBL antenna.

The device is a mono-unit with a USBL transceiver, integrated PC, dual-antenna GNSS receiver and WiFi access point, built for applications that require a non-permanent installation of the USBL antenna with the quickest possible setup and recovery. Its design concept is focused on "drop and play" deployment and hassle-free operation. Unpacking and assembly take minutes, and before launching the buoy, one just needs to turn it on and unfold the GNSS antennas.

QUADROIN AUV

The Quadroin is EvoLogics' next-generation bionic AUV for environmental monitoring. In 2020, Prof. Burkard Baschek and the team at the Helmholtz-Zentrum Hereon joined forces

with EvoLogics to develop these underwater robots for the Helmholtz Association's MOSES initiative. One of this observation system's modules will be a mobile swarm of several Quadroin AUVs geared to collect data in ocean eddies.

The Quadroin is based on EvoLogics' low-drag bionic AUV design, with its outstanding hydrodynamic properties stemming from years of observational research into penguin locomotion. The Quadroin carries a payload of sensors to measure temperature, pressure, oxygen, conductivity, and fluorescence, and achieves speeds of up to 5 meters per second. In 2022, the latest Baltic Sea trials focused on executing coordinated formation maneuvers of three Quadroin AUVs, with EvoLogics USBL buoys acting as communication, positioning and surface relay nodes.



» Quadroin's low-drag design is capable of underwater speeds of 5 meters per second. (Photo credit: EvoLogics)

As part of the US tour, the team demoed two networked Quadroins and two USBL buoys present various real-time scenarios in the field and bring customers first-hand experience of this exciting new ecosystem of next-generation ocean technology.

For more information, visit: www.evologics.de.



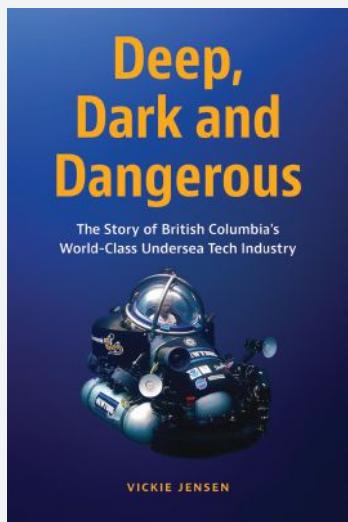
» The Imagenex line-up of Gyro Stabilized Sonars featuring a depth rating from 300 m to 10,000 m (shallow water to full ocean depth). (Photo credit: Imagenex)

MAKING SUBSEA HISTORY

Imagenex Technology Corp. was founded in 1988 by two of the original partners and founders of Mesotech Systems Ltd., which was sold to Simrad in 1985 and now operates as Kongsberg Mesotech, a part of Kongsberg Maritime. After completing a non-competition agreement with Simrad Mesotech, Imagenex started producing high-definition sonar systems. The first imaging head Imagenex manufactured for the commercial underwater industry was unrivaled in terms of its small size. To this day, Imagenex has a reputation for manufacturing some of the smallest sonars on the market.

Imagenex is a unique and innovative company that takes pride in their products and operating a little differently than others. Each product made by Imagenex is individually burned in, tank tested, and ocean tested prior to being delivered to customers worldwide.

Over the last couple of years, the team at Imagenex has collaborated with author Vickie Jensen to help her get her new book finished. *Deep, Dark and Dangerous* tells the story of the underwater tech industry in British Columbia and is now available for purchase. For more information, visit: www.deepdarkanddangerous.ca.



» Vickie Jensen's book *Deep, Dark and Dangerous* tells the story of British Columbia's world-class underwater tech industry. (Photo credit: Harbour Publishing)

UNCREWED VEHICLE SENSORS

In 2004, Imagenex was approached to design some miniature kits (transducer + PCB stack) to be installed in Autonomous Underwater Vehicles (AUVs). Those original kits were a high frequency echo sounder kit for obstacle avoidance, a low frequency echo sounder/altimeter kit for bottom/surface detection, and a sidescan sonar kit to image the seafloor. Since then, Imagenex has designed a few more kits, such as a multibeam kit and a high frequency sidescan kit, and they have all been very popular amongst the AUV, ROV, and USV manufacturers and users.

IMPROVING TARGET ACQUISITION & IDENTIFICATION

Another product that has been in high demand for ROV integration for many, many years is the Imagenex 881A or 881L Imaging Sonar, the difference being the communication protocol—RS-485 or RS-232 for the 881A and Ethernet for the 881L. In 2014, Imagenex introduced an enhanced version of the industry proven imager—the Gyro Stabilized Multi-Frequency Imaging Sonar, or 881A-GS. Imagenex designed the gyro stabilization option to be purchased as a stand-alone product or as an upgrade to an existing 881A or 881L (existing units must be sent to Imagenex for the upgrade).

Traditional scanning sonars are known to provide excellent images, but they depend on the sonar being completely motionless whilst acquiring the data. If there is any movement, the image will appear smeared or even unrecognizable. Integrating the low drift gyro directly into the sonar head has made a dramatic improvement for target acquisition and identification. The ROV pilot no longer has to set the vehicle down on the seafloor in order to produce a usable scan. This saves an incredible amount of valuable time.

For more information on time and money savers, please contact Imagenex Technology Corp at www.imagenex.com.

MANUFACTURER LISTING / A-Z

UNCREWED
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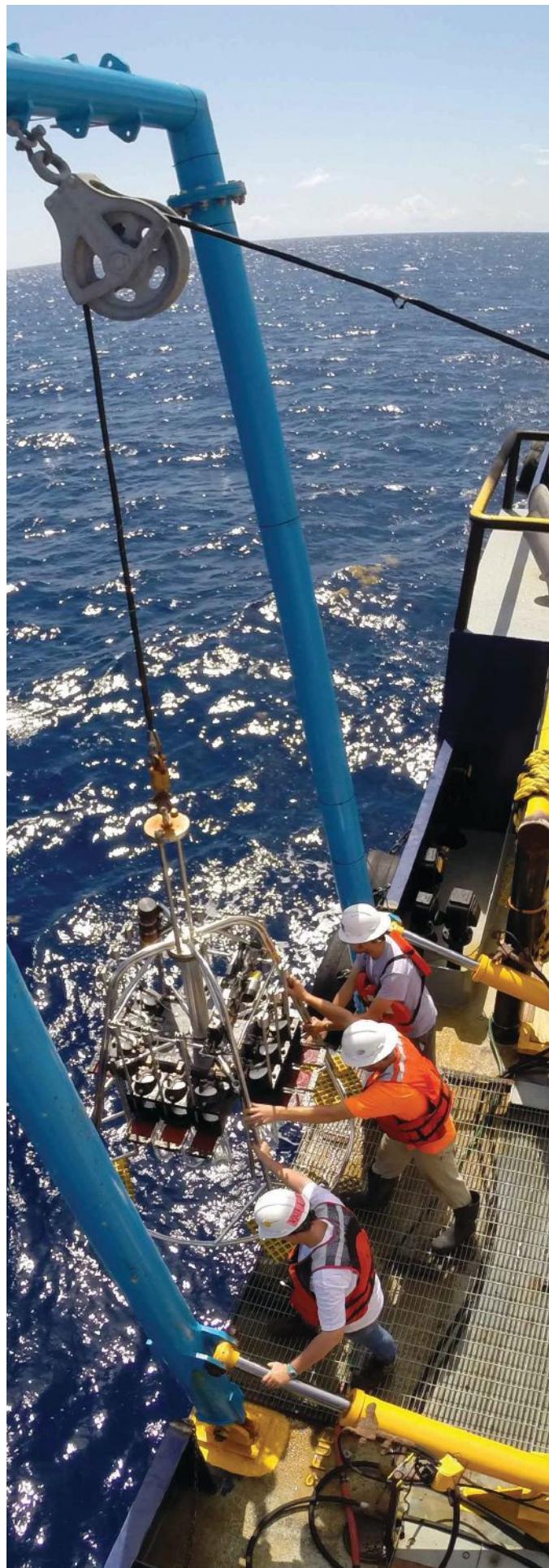
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» The Edge DVR Mobile Workstation features 17" screens that fold out from the main unit. (Photo credit: Digital Edge Subsea)

A world leader in offshore digital video recording and inspection systems, Digital Edge Subsea develops and manufactures products for use throughout the offshore oil and gas industry, working with clients of any size to provide the system that best suits their needs. The company, established more than 12 years ago, boasts a team of hand-picked specialists who are proud to nurture strong customer relationships.

Digital Edge Subsea is now pleased to add another industry first to an expanding product range: the Mobile EdgeDVR Workstation. A great solution for those who have a need for portability or for projects short on space, this portable workstation has 17" integrated triple monitor display units in a small form factor for field deployment. The three screens fold out from the main unit to create a compact system capable of displaying sonar, ROV topside and DVR displays.

It has a total storage capacity of 30 TB, has the same capabilities as the rack mounted system and 4 channel HD recording capability.

The system has 3 removable hard drives which store the survey video and photos. The Windows 10 Pro operating system is stored on a solid state hard drive for increased speed and reliability, with a second solid state hard drive for redundancy. The system is supplied in a custom Pelican case.

RELIABLE SOFTWARE OPTIONS

Digital Edge offer 3 versions of software (Lite, Edge and Pro) and the Mobile EdgeDVR is available in all 3. In addition, you can create a command and control field deployable computing solution by adding a further mobile display unit of another three 17" screens.

You can be assured of a reliable system, whichever unit you

DIGITAL EDGE SUBSEA



MOBILE EdgeDVR WORKSTATION: A PORTABLE OFFSHORE DVR AND INSPECTION SOLUTION

choose. Digital Edge also supply excellent technical support where all systems can be remotely accessed. All units have been designed to be simple to use by personnel of all levels of ability and training is also covered for increased peace of mind.

The 3 levels of software available:

1. EdgeLite: an entry level unit, suitable for surveys and inspections, where there is no requirement for eventing.

2. EdgeDVR will is able to record 4 channels of HD simultaneously. It continues to offer the creation of Workpacks and offline editing.

3. EdgePro has an extended database that allows tasks to be assigned to components under inspection. This allows customers to either create their own Workpacks, or they can be created in-house at Digital Edge. It also provides an automatically generated report to capture inspection results.

DEPENDABLE DATA STORAGE

All units come with EdgeArchive, a data storage and back-up solution that uses an integral app within Edge architecture, to avoid needing a 3rd party app.

Edge Archive handles the transfer of data from the internal DVR drives to Client storage, either on a NAS a Raid, or a phased delivery to multiple external hard drives.

Being a Native app, the data transfer ensures that the quality of Live recordings are not impacted by a 3rd party program trying to access the same file that the DVR app is currently using.

For more information, a quote, or a demonstration of the system, contact info@digitaledgesubsea.com.

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