

# How Modular Construction Maximizes the ROI of Your Underwater Robotic System(s)





## **Inspection-class subsea robotic systems (ROVs) are vital to safely perform underwater missions.**

To get the most out of your investment, make sure the architecture of the vehicle is predominantly modular. This scalable design enables real-time customization and repairs while a mission is in progress.

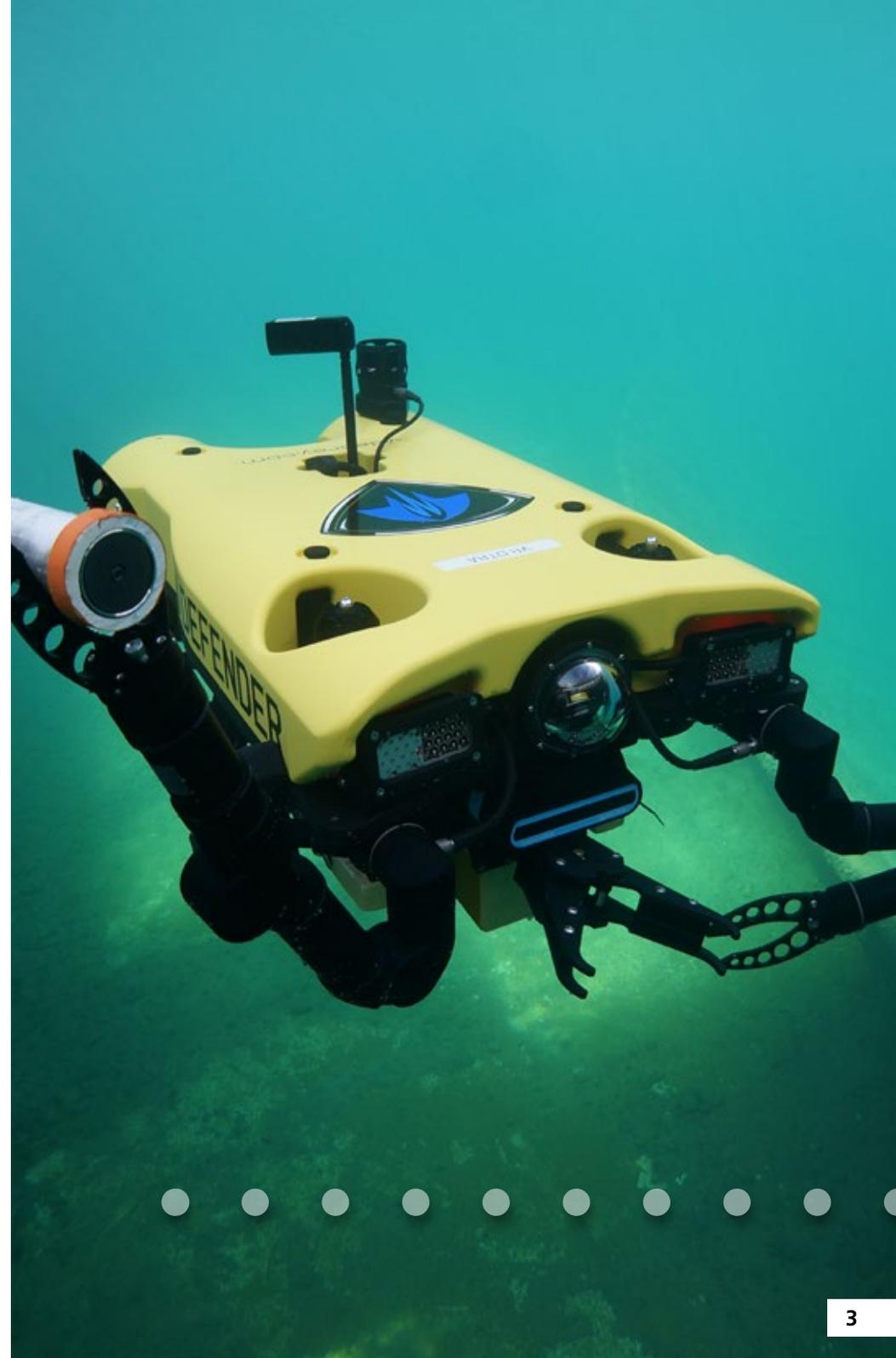
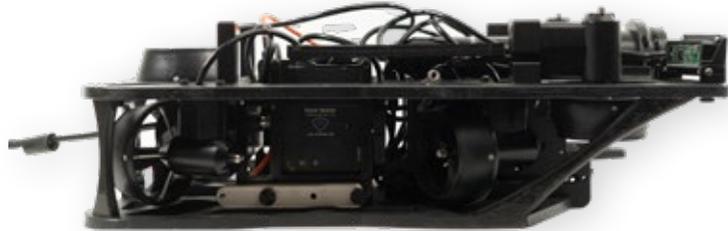
Beyond helping to save money and time, a system with modular construction will never become obsolete. You can upgrade with the latest technology without the need to purchase a new vehicle.

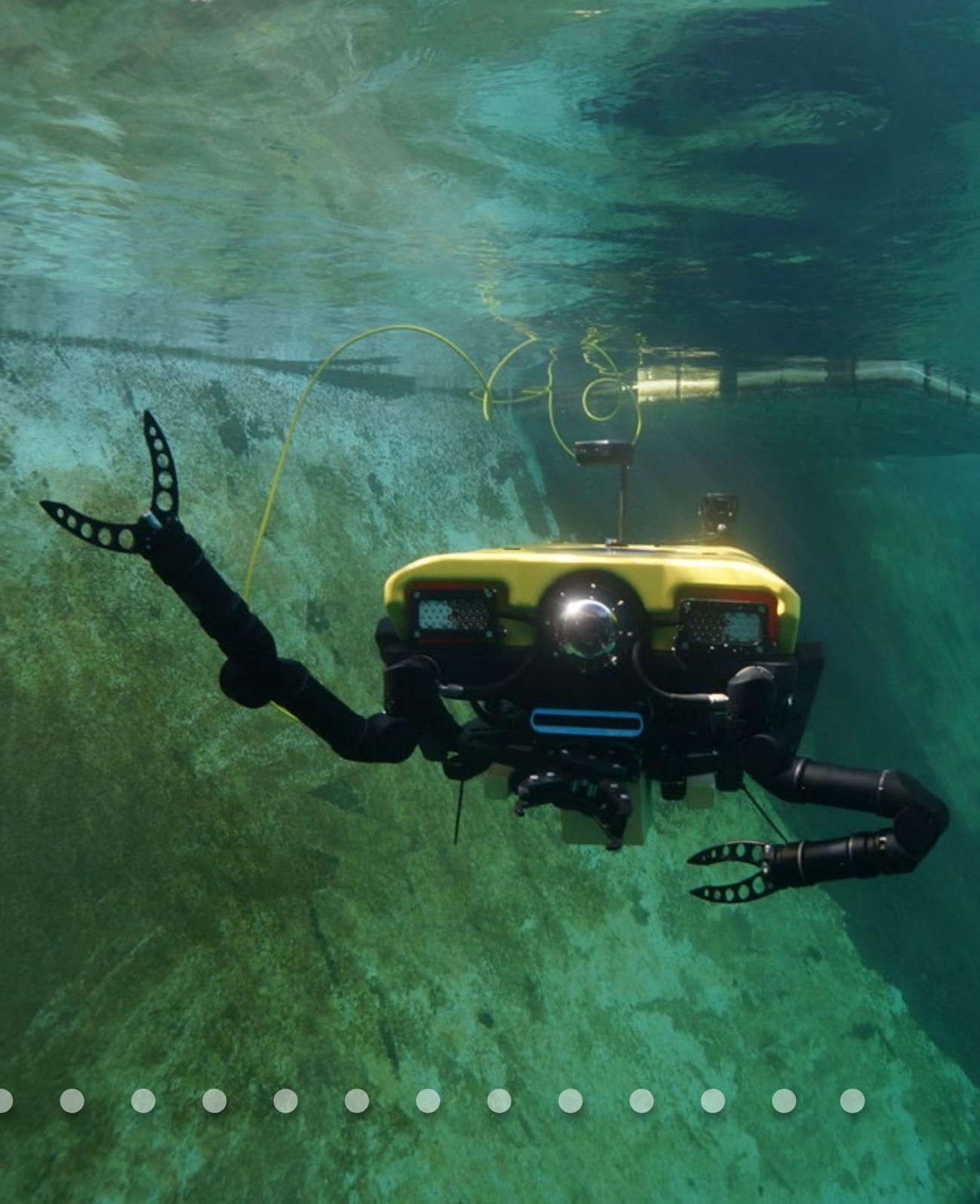
**This eBook reveals how the modular construction of VideoRay's Mission Specialist systems maximizes your ROI over the lifetime of the vehicle.**

## System, Tools and Sensors

Modularity is a common term in our industry, but the modular architecture of VideoRay's Mission Specialist goes beyond components to include core electronics—cameras, housings, power, communications and lights—all residing on a single intelligent network.

This means all tools and sensors can be customized for each mission, replaced in the field, upgraded easily and integrated seamlessly. Your return on investment is actualized quickly because your underwater robotic system is precisely designed for quick start-up and use. If the parameters of the mission change, you can quickly swap tools and sensors by simply replacing them with new accessories to handle the job.





## Modular Base System

Important components customized for your specific missions include:

- Framework
- Propulsion thrusters
- Cameras
- Lighting
- Communications system
- Power system
- Tether
- Vehicle control software
- Thruster

## Tools and Sensors

Integrated accessories to carry out your underwater operations include:

- Navigation modules, GPS and Doppler velocity
- Data-gathering sensors, such as sonar, water parameter
- Manipulator and testing tooling
- Positioning system
- Supervised autonomy navigation system

## Adaptable Power Module

VideoRay's unique construction enables an adaptable modular power system that meets varying payloads and operational conditions for the your mission. The modular design offers unparalleled flexibility to alter the ROV quickly and easily for custom missions or to meet changing conditions during the operation. The power system is designed to provide constant current and voltage control needed for a specific mission.

The Mission Specialist systems can be powered by surface power sources or by onboard batteries. Tether lengths can be hundreds of meters, or thousands of meters if using fiber. The vehicles use a robust power delivery network boosted by high-efficiency power modules to convert energy to voltages needed to support the thrusters, electronics and payloads.

This power flexibility means that a VideoRay Mission Specialist systems can be deployed in areas difficult to access at depths up to 300 meters for an extended period of time with power supplied by the platform or host ship. When batteries are used, the same onboard control electrical system is used with a delivery network to accommodate the battery power source. Depths of 1,000 meters are possible when using onboard batteries.

With the ability to change power delivery on site, you don't lose time or money returning to the ship or port to alter the vehicle. And, even better, you don't have to invest in more different ROVs to handle all the jobs you need to do.





## Expand Capabilities for Custom Missions

An ROV usually isn't used for only one specific job. Frequently, operators need to conduct a variety of underwater missions, each requiring different tools and sensors to perform tasks like locating, measuring, manipulating, grasping and cleaning.

The interchangeable, high-performance modular components of VideoRay's Mission Specialist systems enable customizable platforms, so operators can select the precise sensors, tools, depth rating and thrust needed to accomplish the jobs.

Configuration flexibility to accommodate each job with interchangeable payloads increases the value of the vehicle because only one system is needed to handle a variety of missions. This eliminates the need for multiple ROVs and experts. In addition, a Mission Specialist system will never become outdated, because you can add the latest sensors and tools to your existing vehicle. Operators enjoy the ability to add specialized tooling without having to purchase a specialized ROV.



## Reduce Maintenance Downtime

The modular versatility of the Mission Specialist systems also eliminates operational expenses incurred by having to send the system to the ship, shore or manufacturer for repairs. There is no major disruption of the mission when a sensor or tool malfunctions. You simply replace it, right in the field, by pulling out the module and replacing it with a new one.

An additional cost-saving benefit of the modular architecture is that it provides operators with a redundant system without having the need for a backup system. You simply need to have spare modules on hand to make a quick swap.

Modular Mission Specialist systems maximize uptime and vehicle availability because operators can perform field maintenance and easily integrate sensors and tools.



## Upgrade Technology No Matter the Age

Underwater robotic technology is constantly evolving to improve performance with a strong focus on features such as autonomy, artificial intelligence, and object perception and recognition systems. With a modularly constructed system, the operator doesn't need to purchase a new vehicle in order to access the most recent advancements.

In fact, users who purchased a Mission Specialist system years ago can upgrade the vehicle to the latest technologies and extend its capabilities by simply adding an updated tool or sensor module.

This modular system is enabling onboard technology that will assist the ROV to operate autonomously and without a tether. An autonomy engine module or a subsea Edge processor will support system control at the vehicle. Using Edge technology, an ROV will be able to navigate completely autonomously, informed by what it sees and senses. Acoustic modems will enable through-water communications rather than through a tether.

Subsea vehicle batteries will provide power at the vehicle instead of at the surface through the tether. This will enable the ROV to operate without a tether and return home if the umbilical is severed. In the near future, our battery technology will power tether-less autonomous operations.

Because of the modular architecture, Mission Specialist systems of any age are able to accommodate advanced technologies. This makes them future proof and provides a solid, tangible return on your investment.





## Maximize ROI on Your Underwater Robotic System with Modular Construction

The modular construction of VideoRay's Mission Specialist systems creates flexible and dynamic systems that solve unique mission challenges.

With adaptable modular power systems, expandable custom capabilities, replaceable modules to eliminate repairs and easy technology upgrades, users see ROI quickly and throughout the long lifespan of your investment.



To learn more about how VideoRay can help you optimize your underwater missions with subsea robotic systems, visit [www.VideoRay.com](http://www.VideoRay.com) or call +1 (610) 458-3000

