

UNDERWATER ROBOTIC SYSTEMS

RELENTLESS RELIABILITY



REDEFINING INSPECTION-CLASS PERFORMANCE

In many situations, inspection-class systems can offer a safer, easier and more cost-effective option for executing underwater missions versus traditional work-class vehicles or divers. However, most systems of this size do not have the capabilities or are not robust enough to get serious work done in challenging situations.

That's why we're redefining "inspection class" to give you the capabilities and performance you really need.

VideoRay Mission Specialist Underwater Robotic Systems are much more than underwater cameras. Engineered and built to work hard, they have proven their ability to perform critical jobs in the harshest environments—from swift rivers to open-ocean missions. VideoRay systems deliver industry-leading power, maneuverability and expandability.

And with legendary, durable construction, they can take a beating and keep on working. That's the power you need to get tough jobs done.

CUSTOMER-FOCUSED PRODUCT DEVELOPMENT

Starting with our first ROV system in 2000, VideoRay has grown to become one of the world's leading manufacturers of underwater robotic systems. This growth is driven by one main guiding principle—we engineer our products with you in mind. We focus on real-world customer needs to guide our innovation and new system development. Operators prefer VideoRay systems because they are optimized for intuitive operation, performance and ease of deployment.

ROBUST,
MODULAR
AND **POWERFUL**



MISSION SPECIALIST TECHNOLOGY

The VideoRay Mission Specialist Series of underwater robots is designed and built with power, reliability and flexibility in mind. The Defender is the largest and most powerful configuration, optimized for precise control, heavier payloads, lifting and specialized operations. The Pro 5 system is designed for speed, efficiency and portability. Both Mission Specialist systems can be equipped with Greensea navigation, control, and user interface technologies. The advanced, user-friendly control system provides exceptional stability and maneuverability for complex tasks.

Flexible Modular Design

Mission Specialist robots feature interchangeable, modular components residing on a rugged, purpose-built platform. Thanks to the intelligent, flexible and customizable design of these systems, they can easily be configured in the field to target specific mission parameters and maximize uptime. This versatility sets the Mission Specialist series apart from other ROV systems on the market.

And your investment never becomes obsolete. Simply add updated tools or sensor modules to upgrade the system and extend its capabilities. That's why we say Mission Specialist systems are *right for today, ready for tomorrow*.

Relentless Reliability

Our reputation for reliability is one of the main reasons we are the leading manufacturer of inspection-class robots. We engineer our Mission Specialist systems to withstand a wide range of operational environments for extended periods of time. Whether you deploy your system every day or store it for months between uses, you can rest assured that it will work the way you need it to—every time, everywhere.

Intuitive Operation

Mission Specialist systems and software are designed to be easy to understand, use and maintain, so your operators can quickly become confident pilots with minimal training. That means you can be up and running fast—completing successful missions within just a few weeks of purchase—to also enjoy a rapid return on your investment.

Easy Transport and Deployment

Mission Specialist systems pack the power and functionality you expect from larger, more expensive systems into a form factor that is sized just right, to significantly reduce your costs while streamlining logistics. Their compact size and light weight allow one person to launch, even from extreme heights, off a dock, platform or vessel. And the entire system can be easily transported by hand, by helicopter (North Sea compliant), in the trunk of a car, or as checked baggage on a commercial airline.



DEFENDER

The VideoRay Defender is built with tougher tasks in mind. A larger system (17.2 kg/38 lb) with more power, it boasts seven powerful thrusters that can handle currents up to four knots and has a 1,000-meter depth rating. The Defender configuration is designed for more precise control of the vehicle position and orientation, heavier payloads and demanding intervention. The Defender is able to move in any direction and maintain active pitch to face the vehicle in an upward or downward orientation.

SPECIFICATIONS

Submersible Dimensions	71.12 x 39.37 x 23.80 cm (28.00 x 15.50 x 9.37 in)
Weight in Air	17.2 kg (38 lb) without ballast
Depth Rating	Up to 1,000 m (3,280 ft)
Control Box	Expeditionary Splashproof Controller and Workhorse Operator Control Console
Weight (sub & panel)	36.7 kg (81 lb)
Max Speed	4.1 knots
Additional Options	Deep Surface Deployment up to 1,500 m tether length

PAYLOADS

Sonar – Multibeam	BlueView M Series, BluePrint 750d, BluePrint 1200d, Tritech Gemini ik, Tritech Gemini is
Sonar – Scanning	Tritech MicronNav
Rotating Manipulator – 5 Heads	Parallel Jaw, V-Jaw, Sampler Jaw, Trident Jaw, Cutter Jaw
Navigation	Navigation Package – GPS, DVL, Software Upgrades
USBL	SeaTrac USBL Micron USBL

*The MSS Defender system has been configured for general use applications. If you need specific tools, accessories, or flight characteristics, please contact VideoRay directly at sales@videoray.com or call +1 (610) 458-3000 Option 2.





PRO 5

The VideoRay Mission Specialist Pro 5 system is designed for optimal performance when size, speed and efficiency matter most. Weighing in at 11.8 kg (26 lb), the three-thruster system has a forward speed of over 4.4 knots and a 305-meter depth limit. The Pro 5 configuration is designed to handle missions with size, space, weight and deployment speed constraints, such as infrastructure inspections beyond the reach of divers, search & recovery and exploring the ocean floor.

PAYLOADS

Sonar	BluePrint Oculus 750d, BluePrint Oculus 1200d
Manipulator	Dual Axis (Rotating), Single Axis (Stationary)
USBL	SeaTrac USBL, Micron USBL

SPECIFICATIONS

Submersible Dimensions	51.59 x 33.02 x 25.73 cm (20.31 x 13.00 x 10.13 in)
Weight in Air	11.8 kg (26 lb) without ballast
Depth Rating	305 m (1,000 ft)
Max Speed	> 4.4 knots
Control Box	Expeditionary Splashproof Controller and Workhorse Operator Control Console
Recording Format	Up to 1920 x 1080, 25 FPS
Communications	Ethernet/RS-485

**While the MSS Pro 5 utilizes the same components as the MSS Defender, not all accessories and payloads are interchangeable between systems. If you have any specific questions regarding the payload capacity of the MSS Pro 5, please contact VideoRay directly at sales@videoray.com or call +1 (610) 458-3000 Option 2.

SMALL FOOTPRINT, **OPTIMAL PERFORMANCE**

MODULAR DESIGN UNLIMITED POSSIBILITIES

The modular configuration of Mission Specialist systems enables easy maintenance and seamless integration with a variety of modules and accessories. In fact, we work with the leading underwater accessory manufacturers to develop their products around the size and payload capacity of our systems. So when you purchase a Mission Specialist system, you have your choice of the best underwater tools and sensors to create a custom solution that is purpose-built for your underwater mission.



CAMERA

Select a camera that is best suited for your application—HD, SD, low light, dynamic range.

AHRS MODULE

Attitude and heading reference system provides feedback on the vehicle's orientation and depth.

POWER MODULE

Receives topside power and converts it to levels required by various modules, sensors and accessories.

THRUSTERS

Powerful thrusters can operate in currents up to four knots.

BATTERY

Subsea vehicle battery powers your vehicle without a topside power source.

DOPPLER VELOCITY LOG (DVL)

Estimates the velocity of the vehicle relative to the bottom.

COMMS MODULE

The “brains” of the vehicle, it coordinates control systems and provides data paths for sensors and accessories.

LIGHTING

Super-bright LED lighting modules can go anywhere you need. Operators can toggle between spot and flood for the best illumination.

SENSORS

Integrate a wide variety of data-gathering sensors such as ultrasonic thickness gauges, water parameter sensors and cathodic protection probes.

FORWARD-FACING SONAR

Outfit your system with the most advanced acoustic imaging tools available from top sonar manufacturers including Blueprint, Trittech and Teledyne.

TOOLING

Get the job done with a variety of intervention tools such as manipulators and NDT (nondestructive testing) tools.

FLOAT

Select from two sizes of floats to support your mission. Standard for depths down to 300 m and deep floats for depths down to 1,000 m.

TETHERS

VideoRay delivers a wide range of tether options to support any underwater mission. This includes extended lengths so you can pilot your robot farther and deeper and fiber options to supply more data with higher bandwidth. All VideoRay tethers are reinforced to provide the performance you need, from thinner tethers to reduce drag up to our strongest tethers with 1,000 lb breaking strength.

PERFORMANCE – COPPER

Diameter: 9–10 mm OD
Buoyancy: Neutral
Breaking Strength: 635 kg (1,400 lb)
Recommended Max Length: 450 m
Bandwidth: 60 Mbps (Up to 300 m)

NEGATIVE – COPPER

Diameter: 7.62 mm (0.3 in)
Buoyancy: Negative
Breaking Strength: 454 kg (1,000 lb)
Recommended Max Length: 400 m
Bandwidth: 60 Mbps (Up to 300 m)

NEUTRAL – COPPER

Diameter: 11.7 mm (0.46 in)
Buoyancy: Neutral
Breaking Strength: 457 kg (1,007 lb)
Recommended Max Length: 400 m
Bandwidth: 60 Mbps (Up to 300 m)

HYBRID – FIBER/COPPER

Diameter: 12.0 mm
Buoyancy: Negative (-8/-10 kg/km seawater weight)
Breaking Strength: 730 kg (1,600 lb)
Recommended Max Length: 1.2 km (~3,900 ft)
Bandwidth: 1 Gbps, 100 Mbps (depending on vehicle module)

EXPEDITIONARY COPPER

Diameter: 4.2 mm OD
Buoyancy: Neutral (-2/-3 kg/km seawater weight)
Breaking Strength: 170 kg (375 lb)
Recommended Max Length: 600 m
Bandwidth: 60 Mbps

FIBER OPTIC

Diameter: 5.4 mm
Buoyancy: ~ Neutral (-2/-3 kg/km seawater weight)
Breaking Strength: 300 kg (660 lb)
Recommended Max Length: 2 km (~6,500 ft)
Bandwidth: 1 Gbps, 100 Mbps (depending on vehicle module)

TETHER DEPLOYMENT SYSTEM (TDS)

VideoRay Tether Deployment Systems are designed to store, manually pay out and retrieve your tether while keeping it organized, protected and clean. The Expeditionary Reel and tether, used in conjunction with the Subsea Vehicle Battery, provide unmatched mobility and efficiency. Our Extended TDS case features wheels and a retractable handle for easy transportation in a rugged Pelican™ 0350 case.



POWER SUPPLIES

PORTABLE POWER SUPPLY

The Mission Specialist Portable Power Supply is a clean, quiet alternative to gasoline-powered generators, producing over 2500 W of on-demand power at the turn of a switch.

Battery Pack	Total Capacity	Approx. Run Time***
(12) XX90 batteries in parallel BT-70791CG	118 Ah – 110 Ah usable	4.9–8.5 hr
(12) XX90 batteries in parallel BT-70791CK	90 Ah – 84 Ah usable	3.8–6.5 hr
(1) 6T lithium battery BT-70939AP	103 Ah – 98 Ah usable	3.6–6.2 hr
(12) XX90 batteries in parallel BT-70790B	58.8 Ah – 43 Ah usable	1.5–3.0 hr
(2) M24 AGM batteries in series AC Delco M24AGM	116 Ah – 58 Ah usable	1.0–1.7 hr

Inverter: 24 VDC to 110 VAC; 2500 W continuous 5000 W surge
Physical size: Pelican 2975 Storm Case: 31.3 x 20.4 x 15.4 in
Weight: 50 lb without batteries, 80–110 lb with batteries
Operating Temp: 0°C–45°C



SUBSEA VEHICLE BATTERY

The Mission Specialist Subsea Vehicle Battery delivers power to the Mission Specialist vehicles without the need for a topside power source.

NiMH SPECIFICATIONS

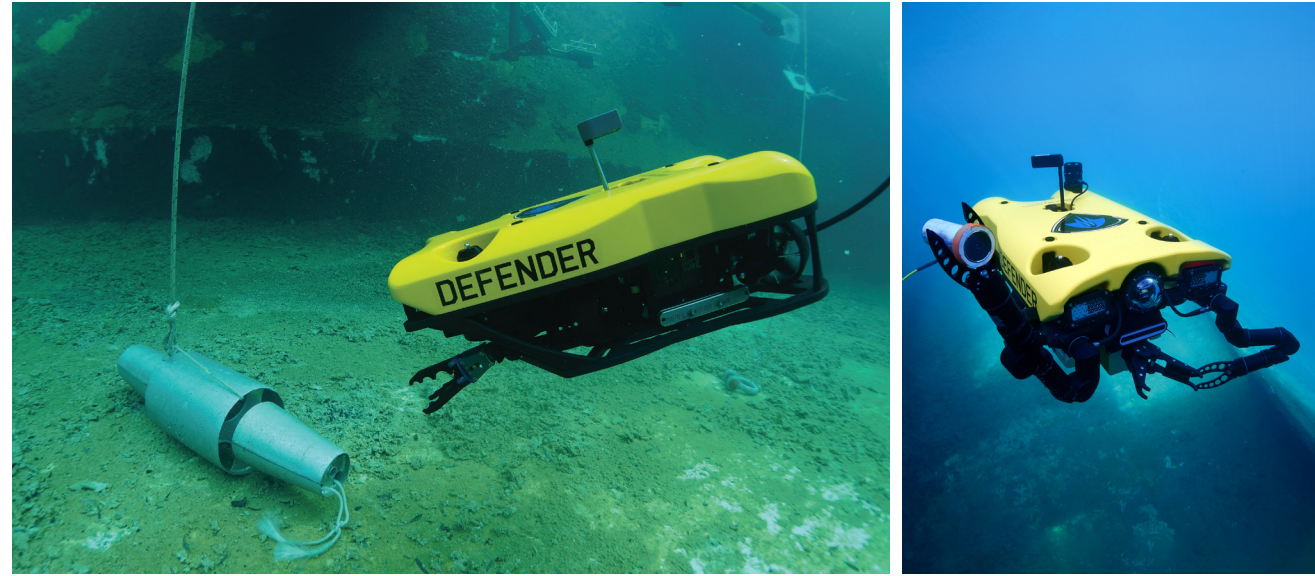
Chemistry: Nickel metal hydride
Output Voltage: Nominal regulated: 48 VDC
Max Current: 15A per battery
Nominal Capacity: 235 Wh per battery
Depth Rating: 305 m (984 ft) or 1,000 m (3,280 ft)
Average Runtime: (2) 0.75– 1. hr
Size: Length – 561 mm (22.08 in); Diam. – 89 mm (3.50 in)
Weight: 305 m – 4 kg (8.8 lb) per battery; 1,000 m – 4.4 kg (9.7 lb) per battery

Li-ION SPECIFICATIONS

Chemistry: Lithium-ion
Output Voltage: Nominal regulated: 48 VDC
Max Current: 15A per battery
Nominal Capacity: 235 Wh per battery
Depth Rating: 305 m (984 ft), 1,000 m (3,280 ft), or 1,500 m (4,921 ft)
Average Runtime: (2) 1.3–4 hr
Size: Length – 561 mm (22.08 in); Diam. – 89 mm (3.50 in)



***Dependent on usage.
Disclaimer: Usable capacity mainly depends on battery chemistry and rate of use. For these calculations, 24 V and average load of 1 kW are used. Discharge potential: Lithium – 95%, Lead Acid – 50%, NiMh – 72%



PRODUCTION PARTNER OF **THE U.S. NAVY**

The U.S. Navy selected the Mission Specialist Defender to be the base platform for the MK 20 Defender ROV program, the small-class ROV for the MESR family of vehicles. The MESR (Maritime Expeditionary Standoff Response) program accelerates the evolution of underwater Explosive Ordnance Disposal (EOD) operations through ROV manipulation, component targeting and advanced navigation control. The Defender was selected due to its modular design, open-systems architecture, one-person portability and its reputation for reliable operation in harsh conditions.



RELIABLE OPERATION IN HARSH CONDITIONS

UNDERWATER MISSION EXPERIENCE

Mission Specialist underwater robotic systems are rugged enough to work anywhere, delivering the portable, reliable systems you need to handle tough jobs in challenging environments. They are used around the world to execute demanding underwater missions to support national security, first responders, object search and recovery, infrastructure inspection, and science and research.

VideoRay has shipped over 4,000 underwater robotic systems while maintaining close working partnerships with customers. We have extensive real-world experience configuring our rugged, modular-based systems with specialized accessory packages to create tailored solutions for specific needs. What jobs do you need to get done? We'll deliver a Mission Specialist system that will work for you—every time.

OFFSHORE OIL & GAS

- Jack-up Rig Inspection
- UWILD Inspection
- Sea Chest Inspection
- Ballast Tank Inspection
- Mooring/Riser Inspection
- Drill Monitoring

MILITARY

- Explosive Ordnance Disposal
- Mine Countermeasures
- Search & Rescue/Recovery
- Port Security Inspection
- Ship Hull Inspection
- Surveillance & Reconnaissance

FIRST RESPONDERS

- Search & Rescue/Recovery
- Drowning Victim Recovery
- Under Ice Search
- Port Security/Harbor Inspection
- Evidence Location/Recovery
- Diver Monitoring

SCIENCE & RESEARCH

- Environmental Monitoring
- Hydrographic Assessment
- Marine Life Observation
- Habitat Observation
- University Research
- Underwater Archaeology

INFRASTRUCTURE

- Lock & Dam Inspection
- Potable Water Tank Inspection
- Potable Reservoir Inspection
- Bridge Footer Inspection
- Culvert Inspection
- Port Infrastructure Inspection

NUCLEAR POWER

- Nuclear Decommissioning Inspection
- Nuclear Turbine & Cooling Pump Assessment
- Intake & Outtake Visual Inspection
- Trash Rack Visual Inspection
- Reservoir Visual Inspection

HYDROELECTRIC

- Hydroelectric Dam Structure Inspection
- Intake & Outfall Inspection
- Trash Rack Inspection
- Penstock Inspection
- Reservoir Inspection
- Turbine Inspection

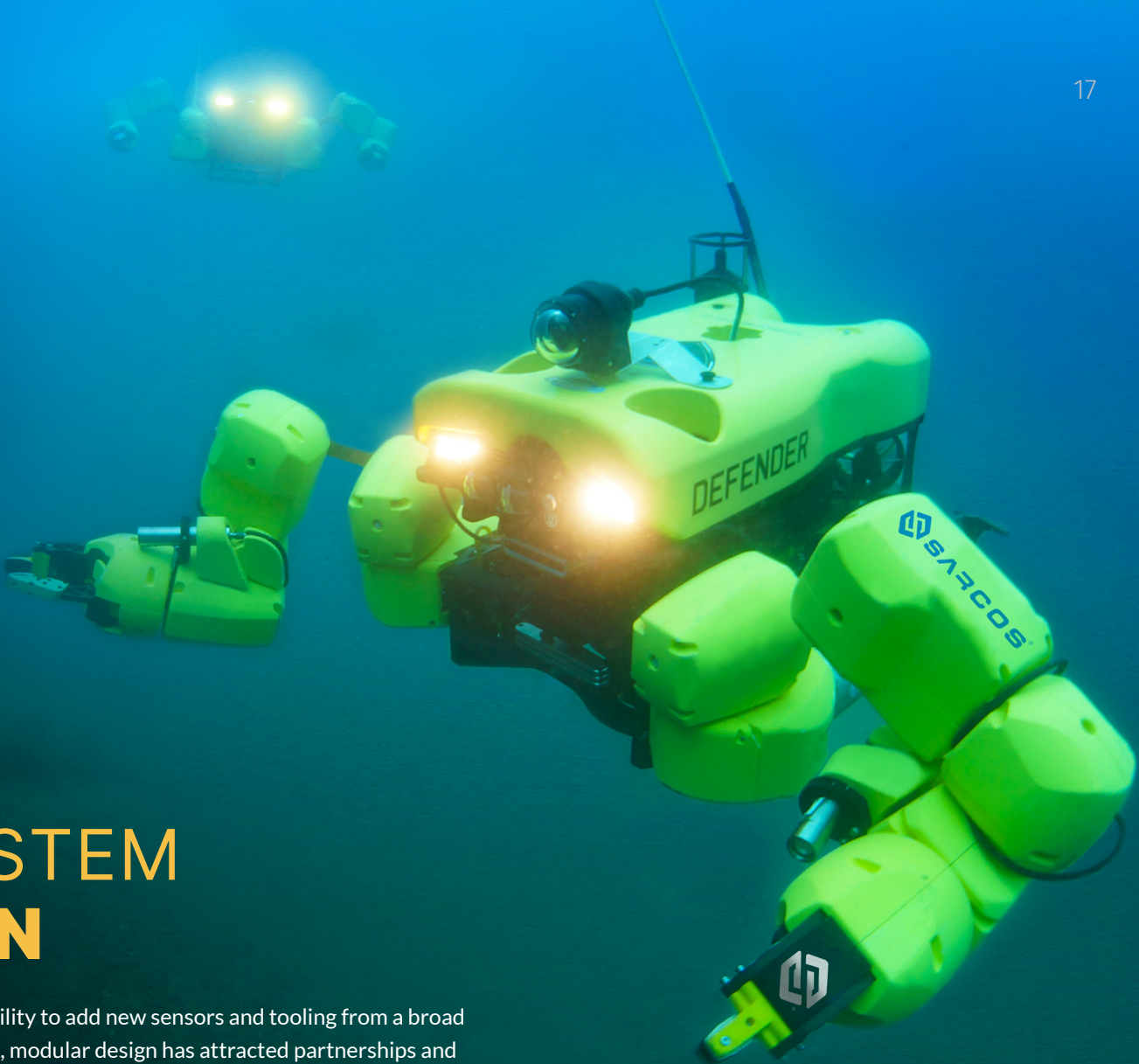
OFFSHORE WIND

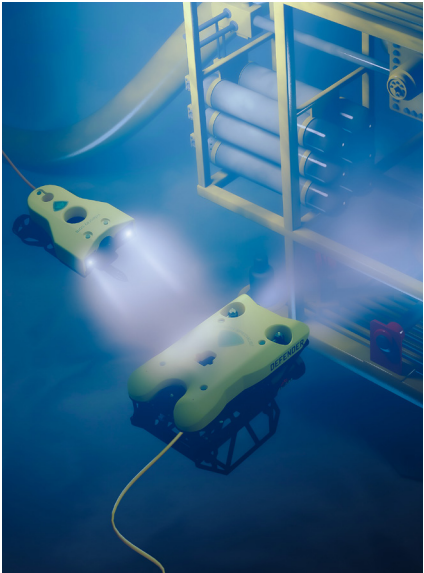
- Wind Turbine Installation
- Wind Turbine Offshore Inspection
- Transmission Line Inspection
- Messenger Line Pull-Throughs

PARTNER SYSTEM INTEGRATION

Mission Specialist technology is unique in the ability to add new sensors and tooling from a broad range of third-party manufacturers. This flexible, modular design has attracted partnerships and collaborations with many industry leaders. VideoRay is proud to work with these partners to develop new capabilities for underwater robotic systems that help customers improve performance in a wide variety of operational conditions.

Together we continue to push the envelope of where one-person portable underwater robot systems can operate and the jobs they can accomplish.





GLOBAL NETWORK

VideoRay has established an integrated global network of Dealers and Partners fully capable of providing the highest quality sales, support and service. These companies offer best-in-class underwater technology around the globe with unparalleled knowledge and professionalism.

VideoRay Dealers

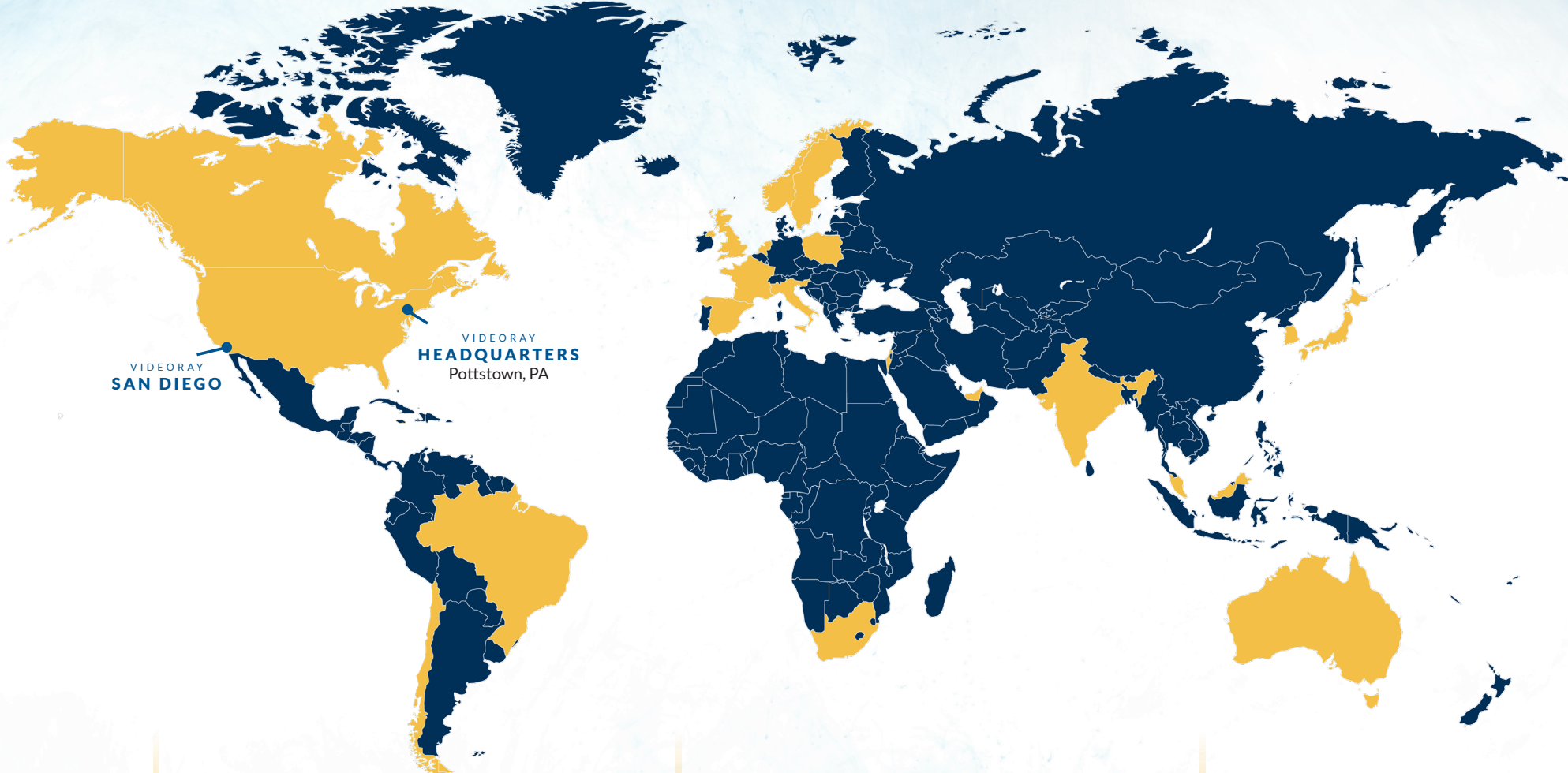
Each VideoRay Dealer can perform on-site demonstrations, answer any questions about parts, options and accessories, and either perform vehicle repairs for you or direct you to the nearest Authorized Service Center.

Authorized Service Centers

VideoRay has strategically placed fully Authorized Service Centers (ASCs) throughout the world to accommodate customer needs. ASCs have been trained to quickly diagnose and repair any issues with your VideoRay system and keep an inventory of parts and spares for quick turnaround in an effort to minimize downtime.

Industry-Leading Warranty and Support

VideoRay stands with you to protect your investment by providing the best product protection and support in the industry. All new systems come with a two-year warranty and we support our systems with parts and service for at least 10 years. Contact us for more details.



Americas

VideoRay Headquarters located in Pottstown, PA. Dealers located in the U.S., Canada, Chile and Brazil

Europe, ME, Africa

Dealers located in the UK, Norway, Sweden, France, Poland, Netherlands, Spain, Italy, Israel, UAE and South Africa

Pacific Rim

Dealers located in Singapore, Japan, Malaysia, India, South Korea and Australia



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