

EXPLORER Autonomous Underwater Vehicle



Photograph courtesy of the University of Bremen

The Explorer class of AUV is a modular vehicle comprising of a forward free-flooding section, full diameter pressure hull and a free flooding aft section. It is optimized for longevity and can be adapted to meet new requirements. It is available in many configurations and depth ratings from 300 to 6000 m. Vehicle systems and payload sensors can be customized at any time throughout the vehicle's life. Payload equipment can be fitted in either of the free-flooding sections, with the associated electronics installed inside the pressure hull on a standard 19 inch rack. The wet payload can include sidescan sonar, multibeam echosounder and sub-bottom profiler, all of which can operate concurrently. Payload data is easily accessible through a high speed Ethernet connection.

The Explorer AUV is renowned for its low operating costs, flexibility and exceptional long range unsupervised capability. In the spring of 2010, an Explorer completed more than 10 days of continuous operations under ice, covering more than 1000 km of unsupervised survey without being recovered. Charging and data transfer all took place underwater. The Explorer is also a very stable sensor platform, with a maximum deviation of 0.2° per second in roll, pitch and yaw.

Explorer AUVs are owned and operated by the French research agency Ifremer (2 vehicles), the University of Southern Mississippi as part of a NOAA project, Memorial University of Newfoundland, the University of Bremen and Natural Resources Canada (2 vehicles).

Principal Characteristics:

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| Length | 4.5 - 6.0 m |
| Depth Ratings | 300, 1000, 3000, 5000, 6000 m |
| Hull Diameter | 0.69 m (300/3000 m), 0.74 m (5000/6000 m) |
| Endurance | 24 - 85 hrs |
| Effective Range | 120 - 450 km |
| Speed Range | 0.5 - 2.5 m/s |
| Dry Weight | 640 - 1850 kg |
| Typical Payload | CTD, Sidescan Sonar, Sub-Bottom Profiler Multibeam Echosounder |
| Power Source | 1.6 kWh Lithium Ion Battery Modules |
| Control Computer | Rack Mounted CompactPCI System |
| Hydroplanes | 3 Aft Planes, 2 Fore Planes |
| Navigation | iXSea Fibre-Optic or Kearfott Ring Laser Gyro INU |
| Velocity Sensor | Teledyne RDI Workhorse DVL |
| Positioning | Motorola GPS Antenna USBL Transponder |
| Depth Sensor | Paroscientific Digiquartz Transducer |
| Altitude Sensor | Kongsberg Mesotech Digital Altimeter |
| Acoustic Communications | Sercel ORCA MATS, LinkQuest or Benthos |
| Radio Telemetry | 900 OR 2400 MHz radio, Iridium Satellite Communications |
| Emergency Equipment | Emergency Transponder, Strobe Light, RF Beacon, Drop-Weight |



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