

ARCTIC EXPLORER *Autonomous Underwater Vehicle*



Photo courtesy of Don Glencross, DRDC

The Arctic Explorer is a derivative of the successful Explorer AUV that was first designed in 2001. ISE has built two Arctic Explorers for Natural Resources Canada to map the sea floor underneath the Arctic ice shelf in support of Canada's claim under Article 76 of the United Nations Convention on the Law of the Sea. In April 2010, one of these vehicles completed over 1000 km of under-ice survey, mapping the sea floor during 10 days of continuous underwater operation. The Arctic Explorer can be launched from a ship or an ice-hole and the modular sections can be separated for transportation.

The Arctic Explorer is the largest of the Explorer AUV class, measuring over 7 m long and weighing over 2000 kg. It is equipped with an extended range capability, making 80 missions covering 450 km possible. The Arctic Explorer has a unique variable ballast system that enables it to park on the sea floor or hold itself on the underside of the ice during the mission. It is rated to 5,000 m depth and is designed to remain underwater between missions, with all servicing and charging being carried out by a small portable ROV.

Principal Characteristics:

Length	7.4 m
Hull Diameter	0.74 m
Dry Weight	2200 kg
Working Range	450 km
Maximum Depth	5000 m
Speed Range	0.5 to 2.5 m/s, cruising at 1.5 m/s
Payload	Knudsen 118 kHz Single Beam Echosounder Sea Bird FastCat CTD Kongsberg Simrad 200 kHz EM2000 Multibeam Echosounder
Power Source	Exide Technologies rechargeable Lithium-Ion batteries
Control Computer	Rack mount compactPCI system
Hydroplanes	Aft planes (Configurable X or inverted Y formation) and 2 foreplanes
Navigation	iXSea Fibre-Optic Inertial Navigation Unit
Velocity Sensor	Teledyne RDI Workhorse 300 kHz Doppler Velocity Log
Positioning	Global Positioning System on surface Acoustic positioning from acoustic telemetry signal when underwater
Depth Sensor	Paroscientific Digiquartz transducer
Altitude Sensor	Kongsberg Mesotech 675 kHz Digital Altimeter
Acoustic Communications	Benthos ATM 885 Acoustic Telemetry System 9 – 14 kHz
Radio Telemetry	2400 MHz radio, Iridium satellite communications
Emergency Equipment	Novatech Strobe and RF Radio Beacon, Drop weight



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