ALSEAMAR
ALCEN

innovation & **services** at **sea**

SEAEXPLORER
Multi-mission underwater glider

OPERATIONAL CONCEPT

- **Intelligence and Surveillance:** Threat detection or environment assessment
- **Anti-submarine Warfare:** Passive Acoustic Monitoring, Detection and Alert
- **Acoustic Signature Management:** Acoustic recorder
- **Search and Rescue:** Support naval operations for black box recovery

KEY FEATURES

- Large-scale (thousands of km) & enduring (weeks to months) observing system, covering the entire water column
- Fleet management application for collecting data and piloting vehicles
- Autonomous vehicle & near real-time data transmission: onshore piloting using satellite telemetry
- Very cost-effected at a collection device: easy to operate, no surface supervising boat required
- Capacity to operate in shallow water with propeller

KEY BENEFITS

- **Stealthness:**
  Minimum visual impact at the surface, very low acoustic signature in depth
- **Economical & Low-Logistics:**
  Rechargeable Battery = Substantial [Budget + Time] savings (No energy pack replacement/No vehicle opening/No re-ballasting)
  Interchangeable payload sections
- **Enhanced Performances:**
  Large ballasting volume: highspeed & maneuverability
  Large payload sections
  Shallow and deepwater operations

GENERAL PRINCIPLE

- The SeaExplorer is a powerful autonomous sensing platform dedicated to performing passive acoustic monitoring and collecting water column data profiles with very large spatio-temporal coverage (from regional to local scale).
- Driven by changes in buoyancy, the vehicle silently glides without wings, facilitating launch & recovery operations, avoiding wing breaks and limiting risks of entanglements (plastic debris, seaweed, fishing nets…).
- The modular design allows fast & easy change of the payload by just replacing the vehicle nose section. The payload bay offers large volumes in wet and hyperbaric sections.
- An integrated hardware/software suite allows constant supervision & mission control from any place in the world by using a server 24/7 available for vehicles calls. When the SeaExplorer surfaces, it sends ashore its GPS position, collected data and receives new mission commands via Iridium telemetry.

SPECIFICATIONS

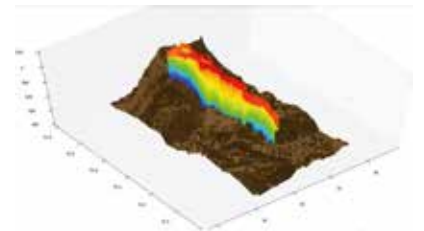|	
Bodysize: (DxL)	0.25 m x 2 m + 0.7 m foldable antenna
Wingspan:	56.5 cm. Wingless for extended survivability
Weight:	59 kg in air
Ballast volume:	1 L (+/- 500 ml)
Speed:	Up to 1 knot horizontal
Payload:	9 L / 8 kg in two sections (wet/dry)
Architecture:	Hybrid mode with propeller (option)
Embedded software:	Payload: Opensource C++ / Linux Navigation:Proprietary
Depth rating:	700 m (850 m survival)
Pitch in navigation:	+/- 15 to 40° (+/- 20° typical)
Turn radius:	20 m (allows virtual mooring)
Battery:	Rechargeable Li-ion
Battery endurance:	Up to 2 months with self-logging GPCTD
Recharging time:	20 hours
Communications:	Triple antenna with strobe light (by default) GPS / Satellite (Iridium) / Radio
Local Radio range:	1 km @ 902 to 928 MHz (Subject to ship antenna and sea conditions)
Data format:	Compressed CSV (native)
Data downloading:	Ethernet cable through external connector
Safety:	Autonomous Drop-weight Option: Locator Pinger (ULB) and/or Argos
Sensors:	4 "pucktype" ports available
Optional sensors:	CTD(Sea-Bird); DO(Sea-Bird); Chlorophyll (WetLabs); CDOM (WetLabs); Turbidity (WetLabs); Hydrocarbon (ALSEAMAR); Methane (Franatech); Sewage & Pesticides(ALSEAMAR); Acoustic Recorder(ALSEAMAR); Altimeter; ADCP (Nortek); Turbulence (Rockland)

Deploying and recovering the glider from small boat

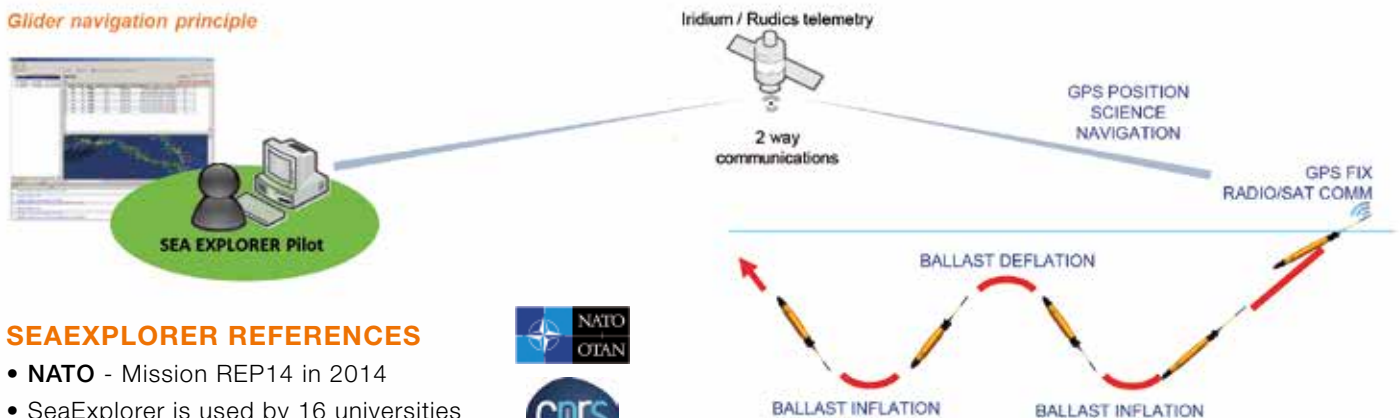Propeller to operate in shallow water

Fast & easy payload change

3D-mapping of collected data

Glider navigation principle

SEA EXPLORER Pilot

Iridium / Rudics telemetry

2 way communications

GPS POSITION SCIENCE NAVIGATION

GPS FIX RADIO/SAT COMM

BALLAST DEFLATION

BALLAST INFLATION

BALLAST INFLATION

SEAEXPLORER REFERENCES

- **NATO** - Mission REP14 in 2014
- SeaExplorer is used by 16 universities and Research Institutes around the world

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