

AUV and ASV Data Recovery

What do you need to know from below the surface of the water?
Do you want to upload data from sensors? Monitor the condition of assets?
Carry out environmental observations?

The issue has always been that acoustic, optical, radio and cabled solutions encounter problems in less-than-ideal conditions, be that shallow water or the 'splash zone', adverse environments due to aeration, turbidity or biofouling, or if the purpose is of a sensitive nature.

When it comes to the Internet of Underwater Things (IoUT), no solution has been able to connect networks on land to digital things below water without the use of cables. Until now.

Now, there is a proven, reliable, cable-less solution.

CSignum's EM technology uses safe, silent and invisible electromagnetic fields to communicate data from devices below the water through the water column, seabed, structures, challenging water conditions, and across the water-air barrier – and back again.

Our technology is the first and only platform to carry data with low-frequency EM fields. It has been tested extensively in multiple real-world trials across a variety of use cases, including the HESS / Ocean Aero AUV demonstrator featured here.

CSignum's EM technology is delivering impressive results beyond what has ever been achieved before.

The data travels from below the water to receivers at or above the waterline, on land or in the air, all in an extremely energy-efficient way.

While acoustic and optical solutions work well in certain specific conditions, they still have their drawbacks. The signals lose their integrity and scatter when, in the case of acoustic, they reach the surface or get close to the surface, due to environmental noise, or, with optical, in adverse environments where line of sight is compromised or ambient light causes interference. Acoustic solutions can also cause harm to marine life.

Cables will snag or fail due to repeated stresses from wave motion, and are expensive to repair or replace. The methods of fixing them in place can cause erosion or damage to the seabed, or be unsuitable in locations with a fragile ecosystem.

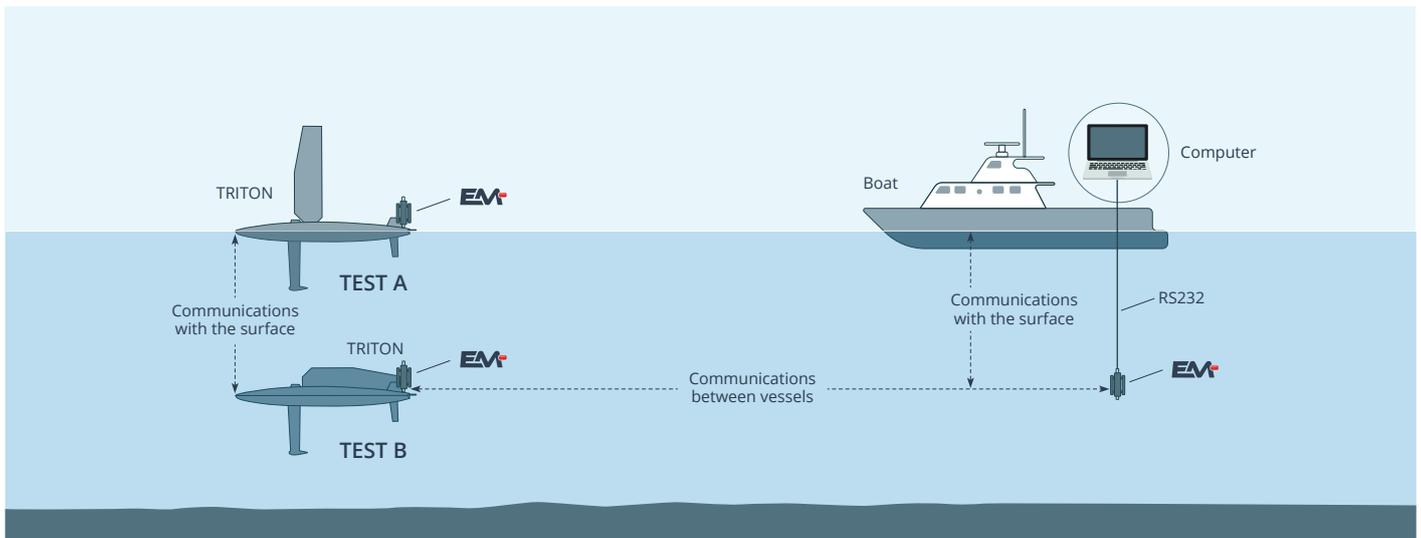
The CSignum technology works seamlessly with the standard interfaces of sondes, sensors, AUVs, ADCPs and dataloggers. It optimises power consumption and battery life, reducing the need for routine maintenance.

CSignum continues to push the boundaries of underwater electromagnetic transmissions.

CSignum technology during the Ocean Aero Trials



TESTING SCENARIOS



FUTURE PLANS

CSignum's technology provides the solution to digitise and scale subsea devices for underwater industries, bringing you a truly Internet of Underwater Things, encouraging greater sustainability, delivering increased performance, and allowing preparedness for unforeseen events.

AUV AND AUSV DATA RECOVERY

The development of AUVs (Autonomous Underwater Vehicles) and the number of use cases have proliferated over the last few years. They will revolutionise the way we collect subsea data and supercharge our ability to monitor underwater environments and infrastructure.

Transmitting data wirelessly and combining that underwater connectivity with autonomous vehicles could automate data acquisition and retrieval even further, enabling activities like

grand-scale ocean observing or monitoring large assets such as petroleum or gas pipelines.

Our technology was used in an industrial asset integrity initiative underway at HESS for monitoring, inspecting and repairing assets at sea in the oil and gas sector using autonomous vehicles – a project that has very promising potential for environmental monitoring.

HESS and Ocean Aero have successfully completed initial trials with our EM technology deployed on a TRITON AUSV (Armed Unmanned Surface Vessel). It sent and received information from underwater sensors positioned either on the sea floor or on submerged buoys. Our unique advantage of being able to transmit through the water-air barrier allows the data to be collected by either underwater, surface or even airborne vehicles. This figure illustrates the scenarios tested in this use case.

“The ability to deliver underwater communications utilising the CSignum’s EM technology unlocks exciting opportunities to expand HESS autonomous operations. By autonomously collecting and communicating subsurface data wirelessly with the TRITON, we can speed up information gathering for HESS – and that means faster decision-making.”

Keith Blystone, Chief of Staff at Ocean Aero