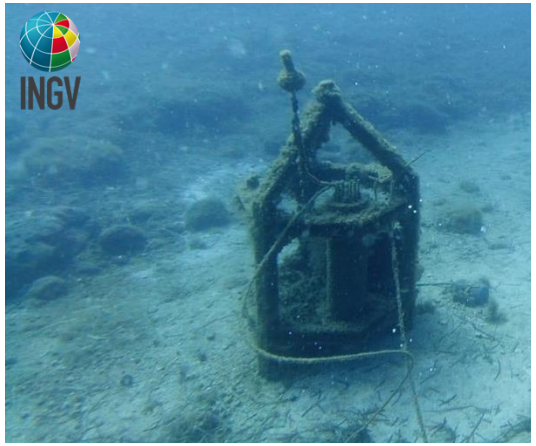
Our R&D program at Sea Srl is strongly aligned with the EMSO scope. We focus on developing advanced underwater observatories, robust power management systems, and real-time data transmission solutions that meet the demanding needs of long-term marine monitoring.

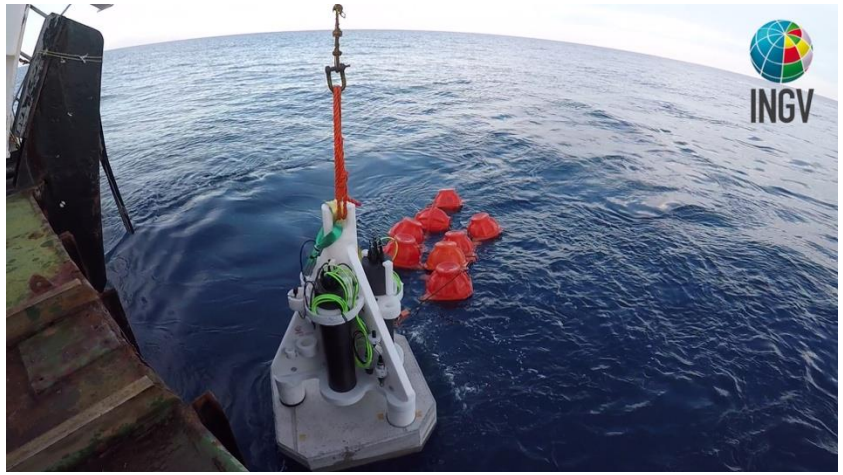
• **R&D Alignment :**
– Our work on modular, scalable sensor platforms and cabled/autonomous observatories directly addresses the critical need for reliable, continuous ocean monitoring.
– We face challenges such as operating in extreme conditions, ensuring data integrity over long distances, and integrating different sensors inputs all areas where EMSO's multidisciplinary expertise is invaluable.

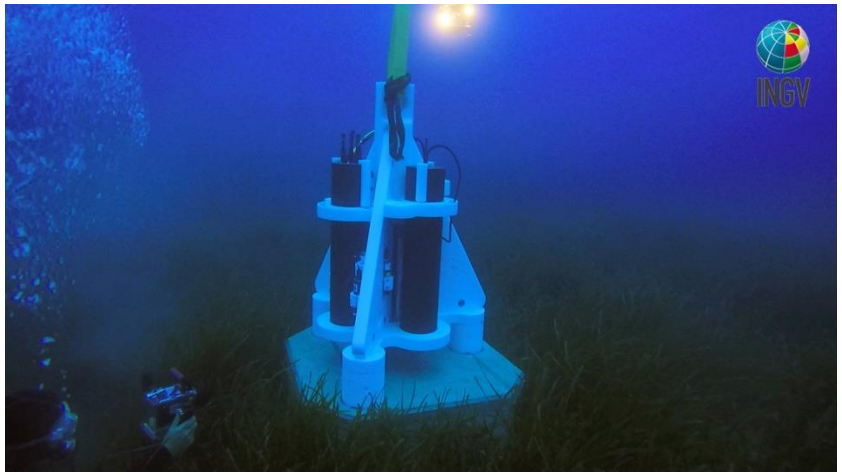
• **How EMSO Can Help:**
– **Physical Access:** We require regular, flexible access to deep-sea infrastructures and cabled/autonomous observatory networks for in-situ testing, calibration, and performance verification of our systems.
By collaborating with EMSO, we aim to refine our technology, gain critical field insights, and contribute to a broader, coordinated approach to ocean monitoring. This partnership would not only enhance our R&D outcomes but also drive forward sustainable marine research and operational excellence.

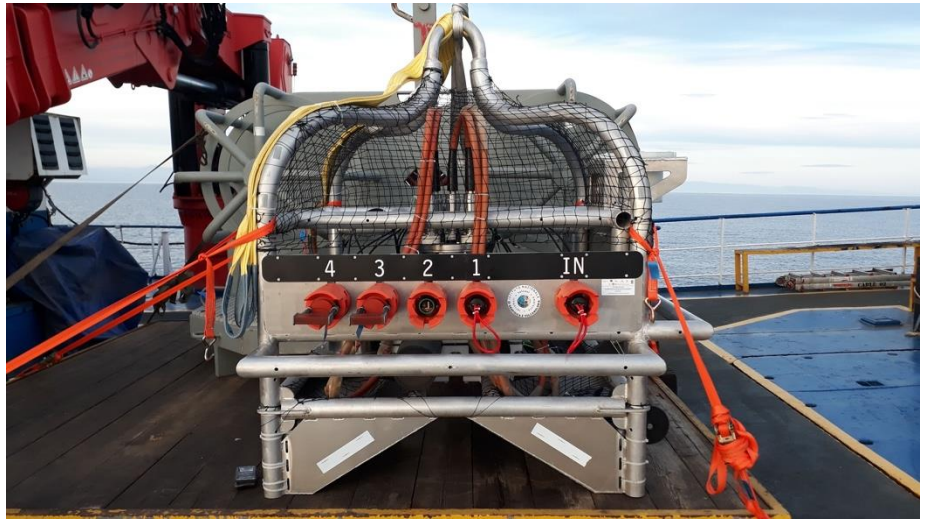
Thank you for considering us, and we look forward to further discussions on how EMSO can support our vision and help us overcome our technical challenges.

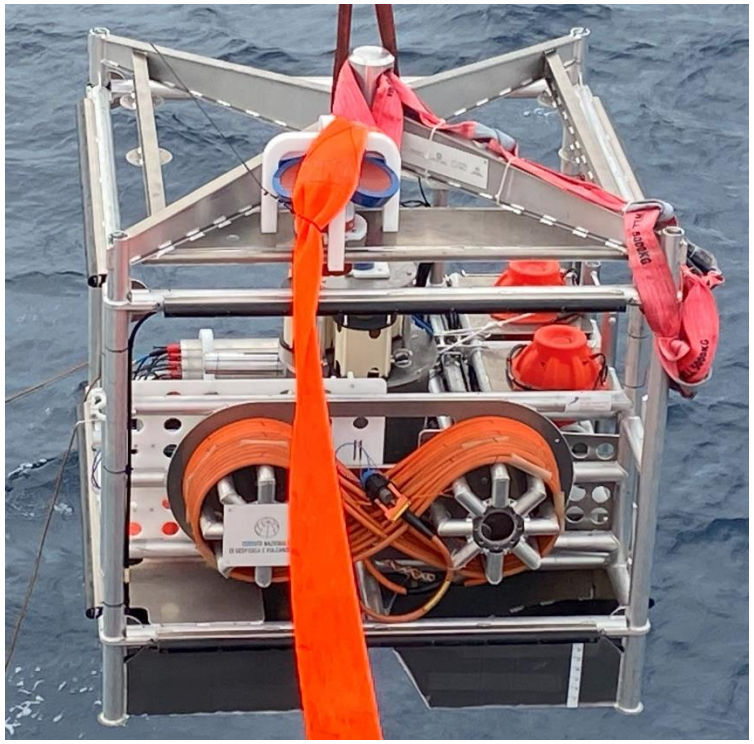
Pictures shown some of our cabled and autonomous shallow water observatories

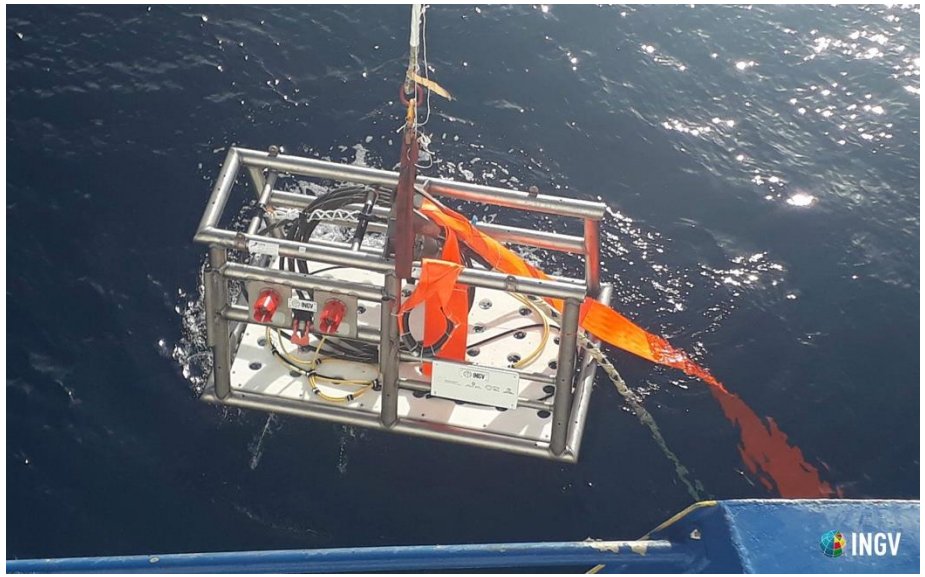












In the past years SEA Engineering provide to the following :

- **C**able **T**ermination **F**rame 3500 m dept rated
- **J**unction **B**ox 3500 m dept rated
- **C**abled **O**cean **O**bservatory 3500 m dept rated
- **S**hallow **W**ater **O**bservatory 200 m dept rated

And currently we are close to provide a **M**edium **V**oltage **Converter** (**MVC**) for **Itineris project**

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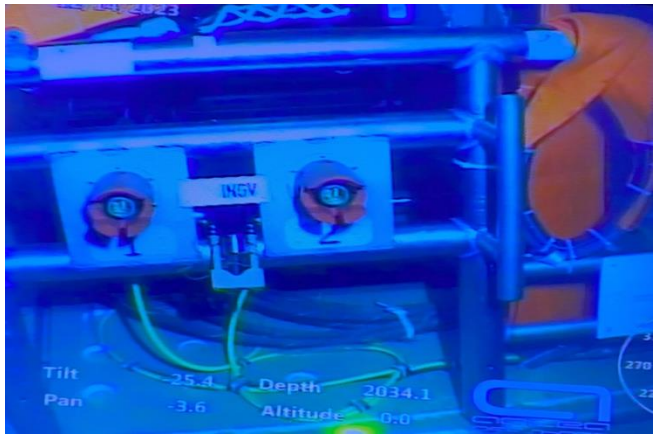
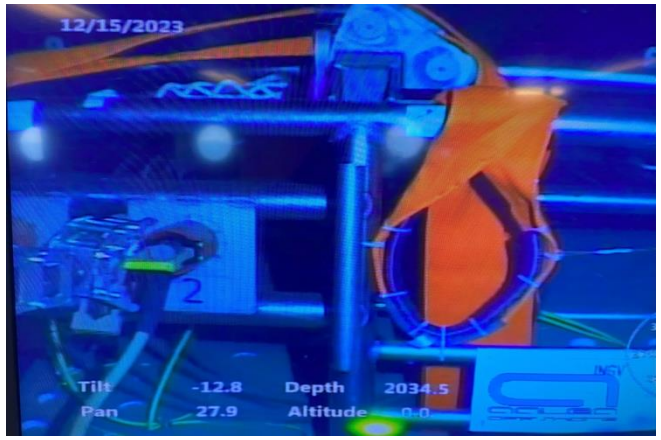
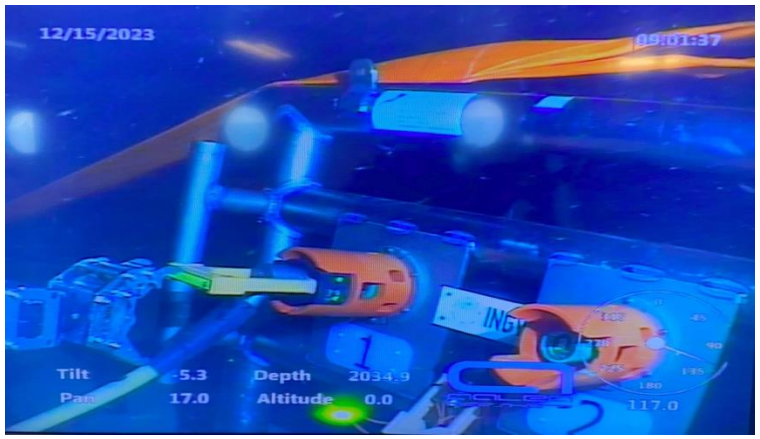
Cable Termination Frame (CTF)

Sea Engineering provides tailor-made engineering solutions for terminating subsea cables. The main function of a cable termination is to provide connection points for the electrical and optical components, while also transferring the necessary strength between the cable's armor and the equipment. Sea engineering can provide Cable Termination Frame 3500 m dept rated equipped with ROV wet mate able connectors, with or without power supply equipment such us Medium Voltage Converter (MVC)







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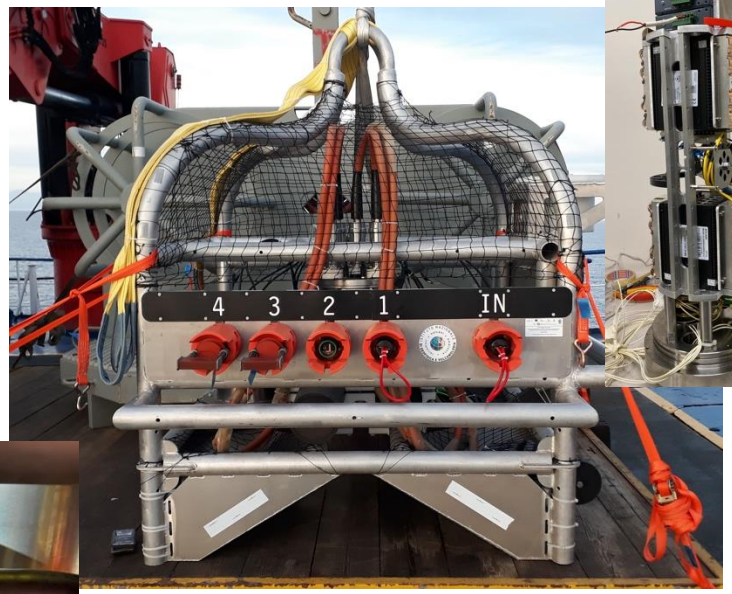
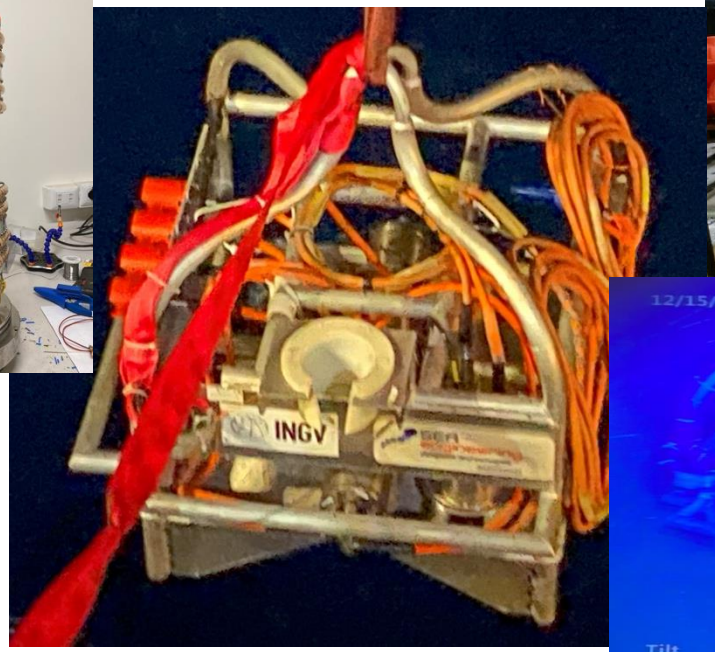
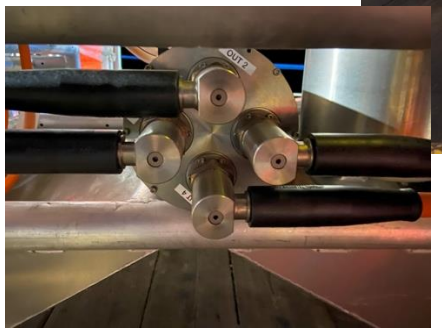
Junction Box (JB) & Medium Voltage Converter (MVC)

SEA design and develop deep sea underwater **JB** and **MVC** for scientific and oil & gas application.
The Junction Box can provide multiple wet-mate able connections for various users such us Cabled Ocean Observatories, underwater network equipment and sensors that required large amounts of power and fiber optic communication bandwidth.

Power distribution system customizable by the client, is designed to provide high reliability and MTBF, each output are protected against Over/Under voltage, Over/Under current, short circuit and ground fault. Our solution can provide up to 2kW. Redundant optical network uses state of the art fiber data communication components based on PTP (Precision Time Protocol) complainant Gbit network.







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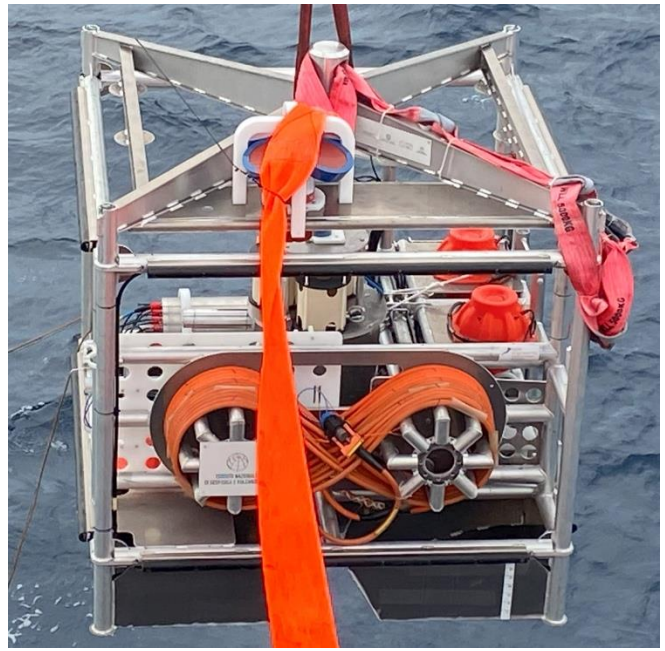
Cabled Ocean Observatory (COO) – Stand Alone Ocean Observatory (SAOO) 3500 m depth rated

The seafloor platform is an aluminum or plastic structure that host various instruments, data is acquired through a single time synchronization system. The platform is powered by an electro-optical cable that runs from the land station to the deployment area on the seafloor for the **COO** version and a battery pack for **SAOO**



Main features:

- Redundant fiber optic link for **COO** version
- Compass
- Client PTP – PPS Output + PPS Time Code on **COO** version, Atomic clock for **SAOO**
- Customizable Input voltage range between 200-420 VDC for **COO** version, Customizable Input voltage range for **SAOO**
- Redundant power supply (max power output 300W)
- Up to 11 ethernet port for subsea equipment
- Up to 14 serial port (configurable RS232/422/485) for subsea equipment
- Up to 12 output at 12 VDC , Over/Under voltage protection, Current limiter protection and I/V readout
- Up to 12 output at 36 VDC, Over/Under voltage protection, Current limiter protection and I/V readout

The current version of the seafloor platform in **Western Ionian Sea Facility** is equipped with the following instrumentation:

- Integrated seismometer and accelerometer;
- Gravimeter;
- Scalar magnetometer and vector magnetometer;
- CTD – conductivity, temperature, depth, oxygen sensor, chlorophyll fluorimeter, and turbidimeter;
- ADCP – Acoustic Doppler Current Profiler;
- High-frequency hydrophones (up to 200 kHz) for tracking cetaceans;
- Low-frequency hydrophone (up to 12 kHz) to detect signals of geophysical, oceanographic, anthropic interest;
- Pressure sensor used to monitor variations in the water column height for tsunami detection.

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