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IMR LoVe Ocean Observatory System and Components

About the client

Institute of Marine Research (IMR)

The Institute of Marine Research (IMR) is one of the biggest marine research institutes in Europe, with about 1,100 employees. Main activities are research, advisory work and monitoring.
Through its research and advice, the IMR seeks to help society to continue exploiting the valuable assets in the sea sustainably.

Read more:
https://www.hi.no/en/hi/news/2020/august/love-ocean-observatory-fully-operational-1

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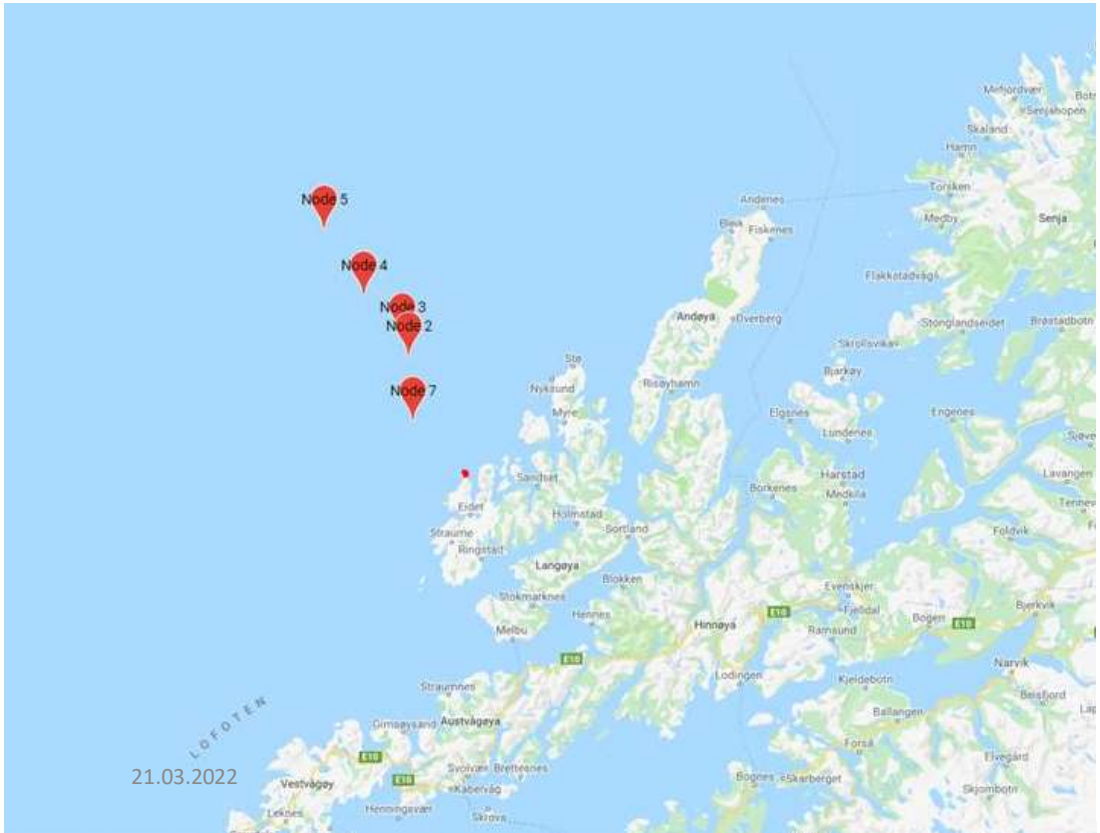
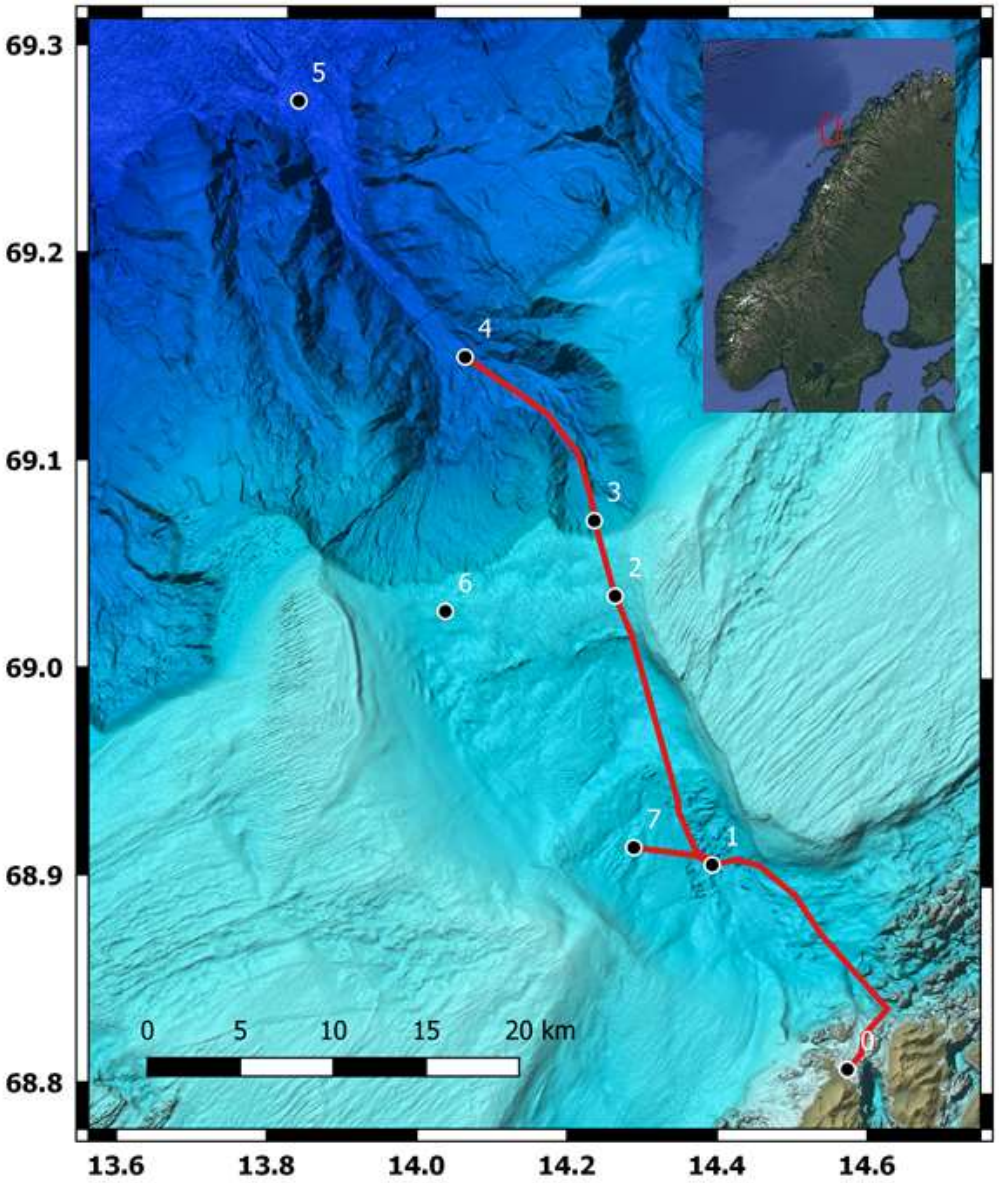
Lofoten Vesterålen (LoVe) Ocean Observatory

- Largest European oceanographic Real-Time observatory
- 6 seafloor landers installed between 200m and 2500m depth
- 2 landers with 1300m and 2300m moorings connected
- Power supply and Fibre data transmission by a 55km cable following the gorge down to 1500m





Trawl frame with lander

- The Lander is placed inside a trawl frame which provides ballast weight and protection
- In the centre/bottom of the trawl frame there is a release bolt, which locks the lander to the trawl frame
- The wireless power and signal module sits in the bottom of the trawl frame
- The trawl frame has 4 certified lifting eyes, ROV handles and 8 Anodes
- Square foot print of the frame is 220cm x 230cm
- Total weight of trawl frame and lander in air is approx. 1550 kg

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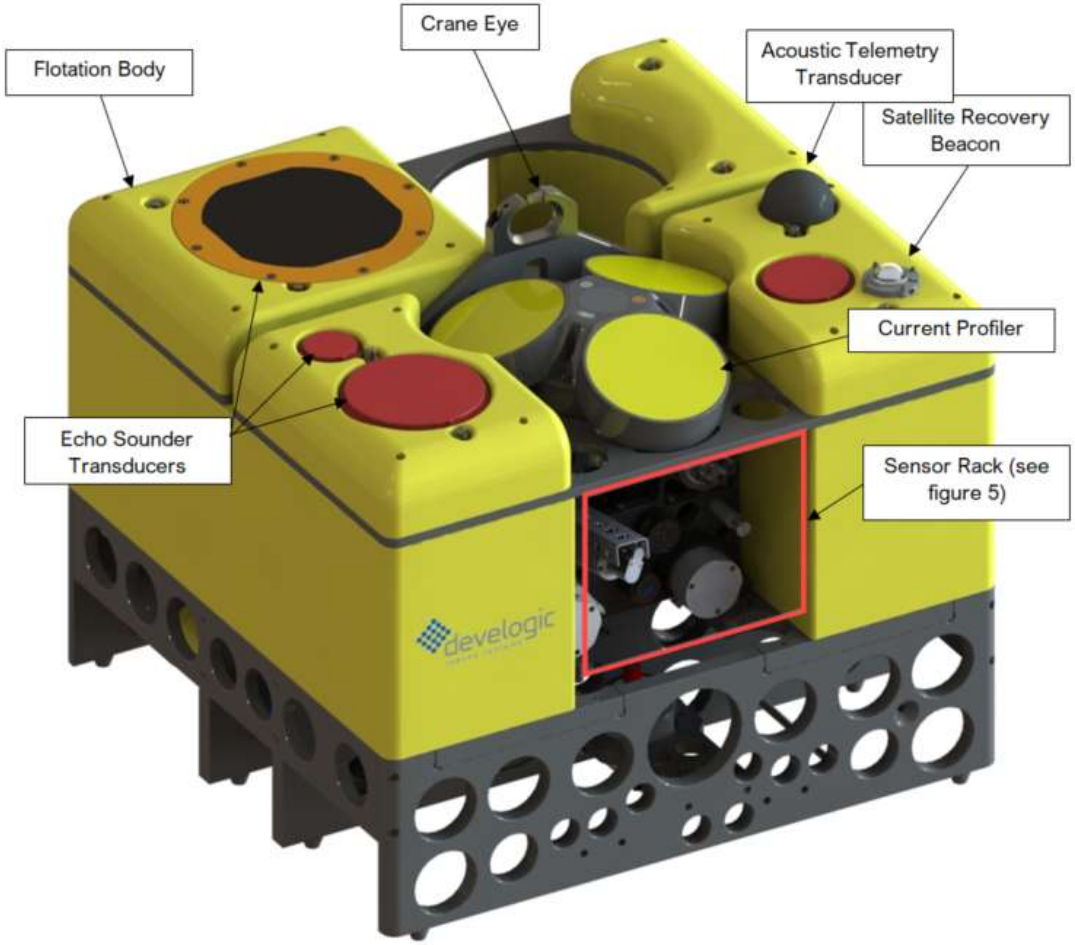
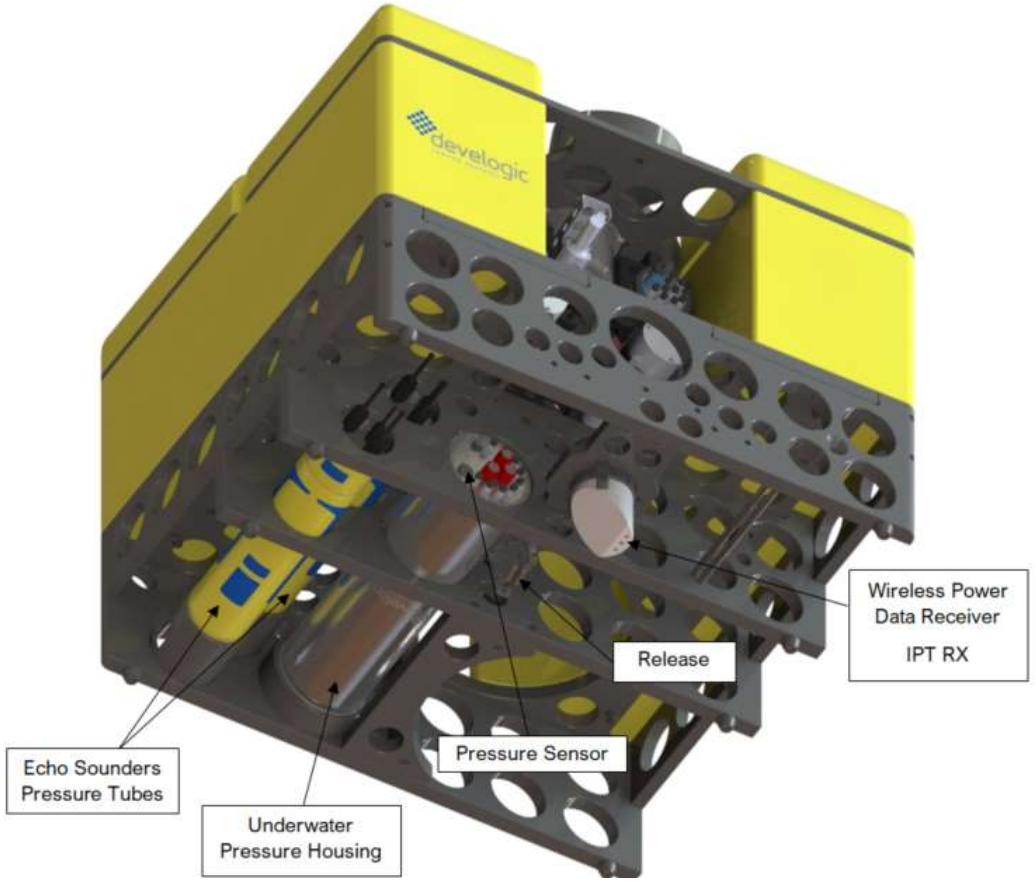
Sensor Platform MSL.3000 (Main Lander)

- The develogic MSL.3000 lander can be used in different applications with a combination of different equipment
  - Current measurement
  - Water quality
  - Sonar scattering
  - Gas/Oil leak detection
  - Camera
  - Hydrophone
  - Acoustic modem
  - Iridium beacon/Flash (for recovery)
- MSL.3000 is a modular, flexible and lightweight seafloor lander that can be deployed in depth of up to 3,000m. The modular flotation body allows integrating different sensors
- The lander is manufactured entirely from fully corrosion resistant materials: Syntactic foam, Titanium, Polyoxymethylene (POM), BK7 glass and sapphire
- This core lander has a square footprint of 1.2m x 1.3m. The total weight of the platform is approx. 700kg (in air)
- Size and weight is decided by the equipment to be installed on the lander

Equipment on board





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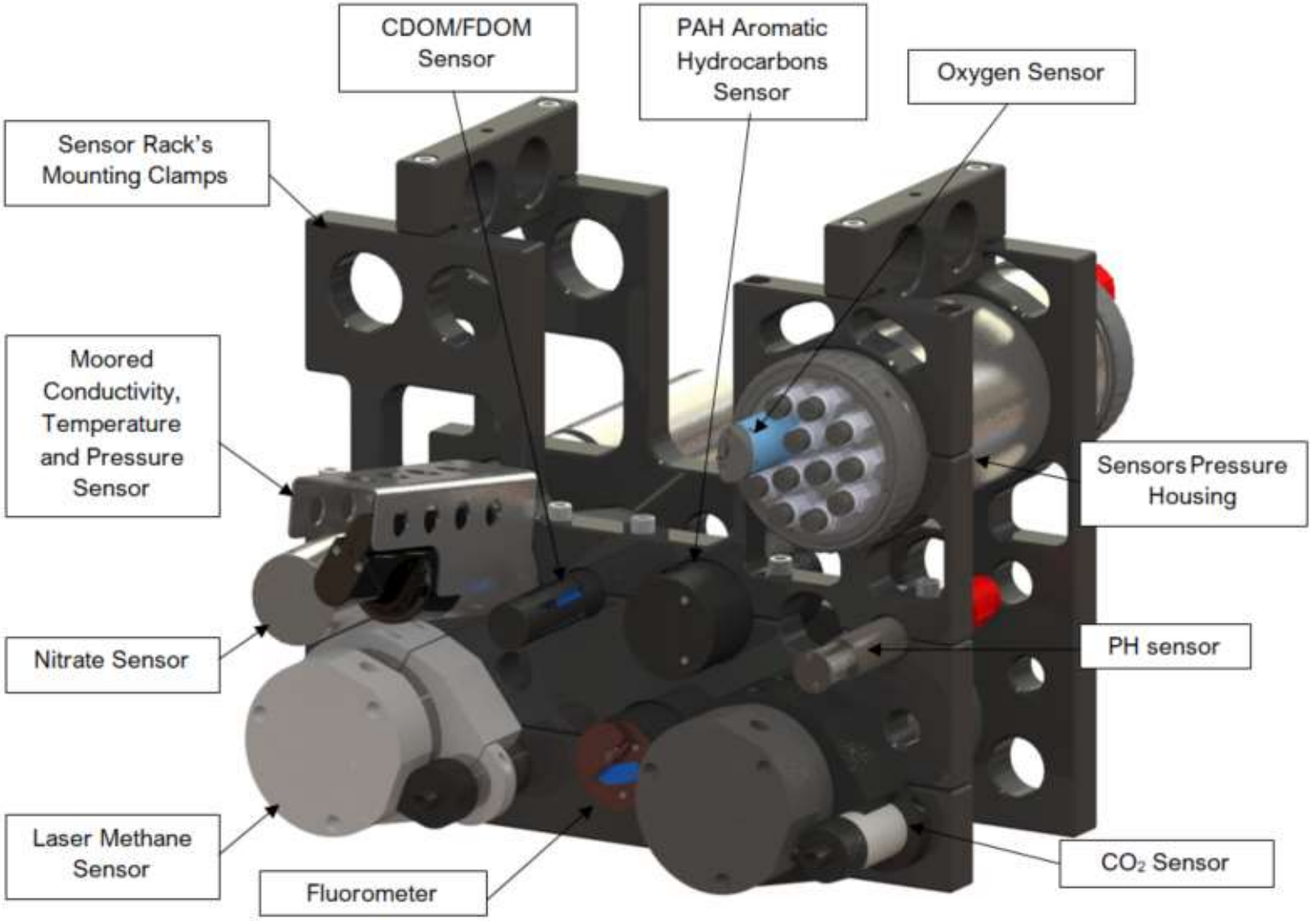
Water quality sensors



Satellite w/camera and acoustic recorder

The system includes smaller landers satellites. These are connected to the lander by 50m cable providing power and Ethernet signal. After deployment of full system, the satellite is placed by the ROV closer to interesting objects like corals.

By the real-time cable the camera and pan/tilt can be operated by the client anytime.

The satellite includes:

- High resolution, wide angle digital still camera
- Two LED lights
- Full rotation Pan/Tilt arm
- Acoustic recording system/hydrophone
- Wireless power and signal module
- Release
- Ballast plate with zinc anode and ROV handle

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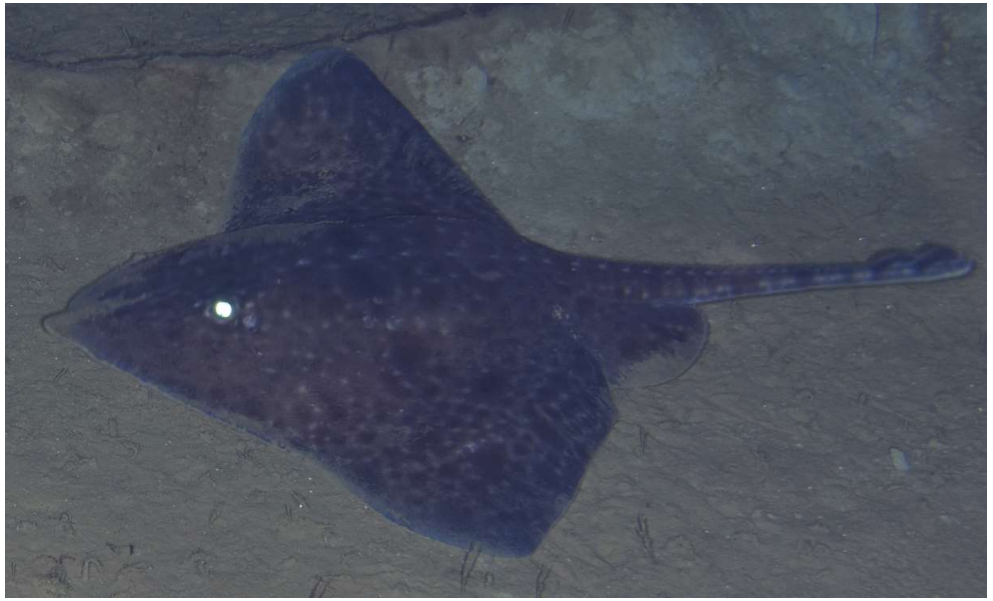
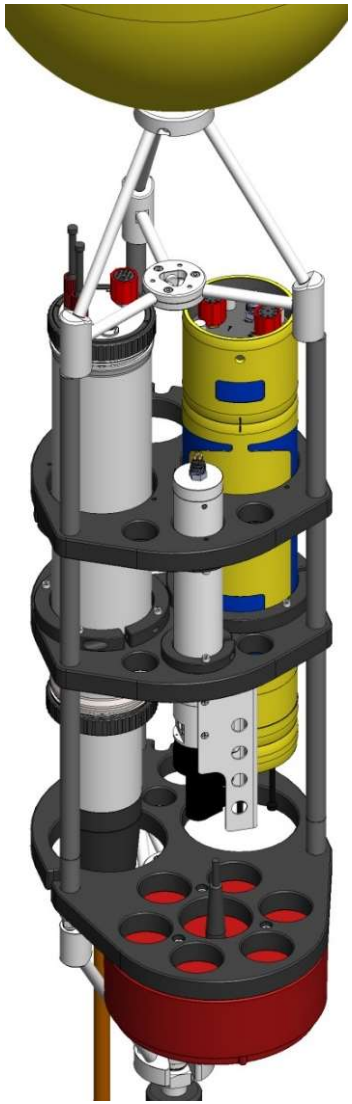
Pictures from 1500m depth

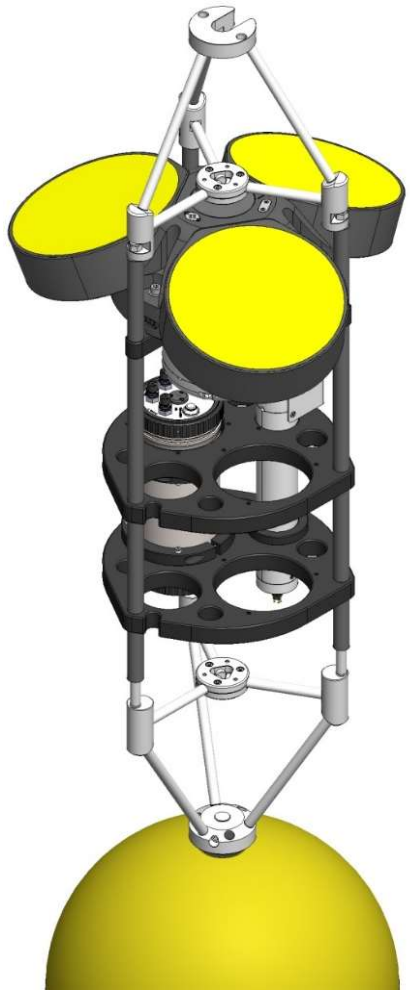


Moorings

The two deepest locations at 1500m and 2500m depth includes moorings.

- 20 pcs x 50kg floats to provide buoyancy
- Measurements taken over full depth
  - Current profiles
  - Sonar scattering.
  - CTD
  - CO2
  - Oxygen
  - Nitrate
  - pH
- Connected to lander for real-time
- Integrated swivel and release
- Connected to a 2,5t anchor





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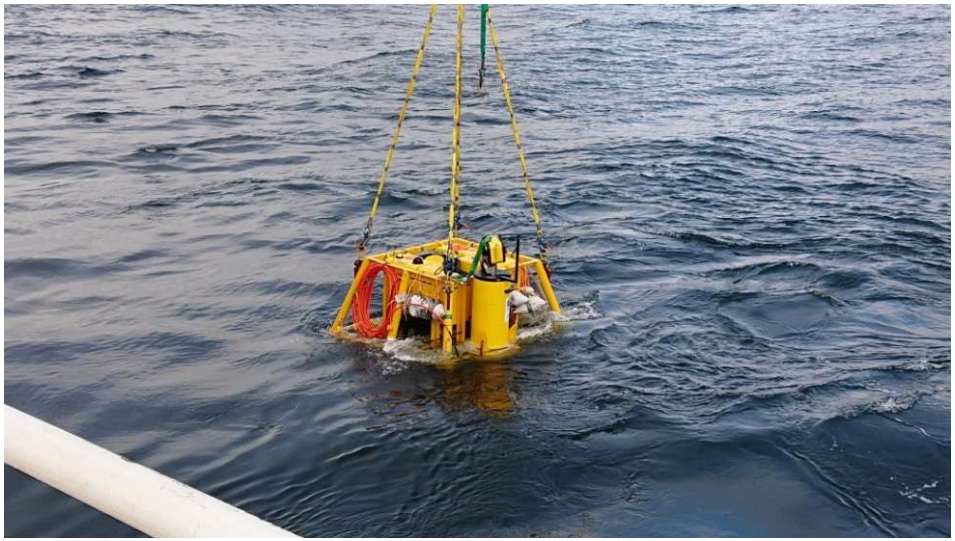
Offshore Installation



Offshore Installation

Lander and satellite installed on seabed

Wireless Power and Data connectors Demonstration

LoVe Lander with power and signal connection to land released from 220m depth with Ham.Base acoustic modem in Vesterålen, Norway

Thank you for your attention

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