



Center for Marine
Environmental Sciences



Introduction

- Engineer at MARUM since 2010
- my main tasks: AUV operation, maintenance and sensor integration
- last expedition with AUV Seal and ROV Quest, Greenland Sea MSM109 in August, searching Black Smokers

Topics:

- AUV Seal 5000
- AUV Imgam
- H-ROV
- Waveglider
- Quest replacement
- MEBO 70&200 / Squid



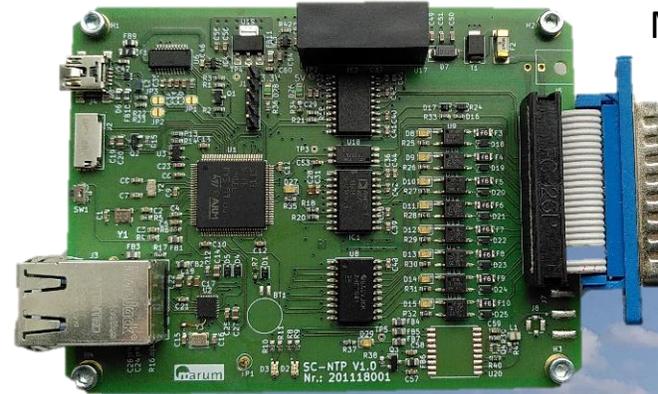
AUV Seal 5000

ISE Canada Explorer from 2006

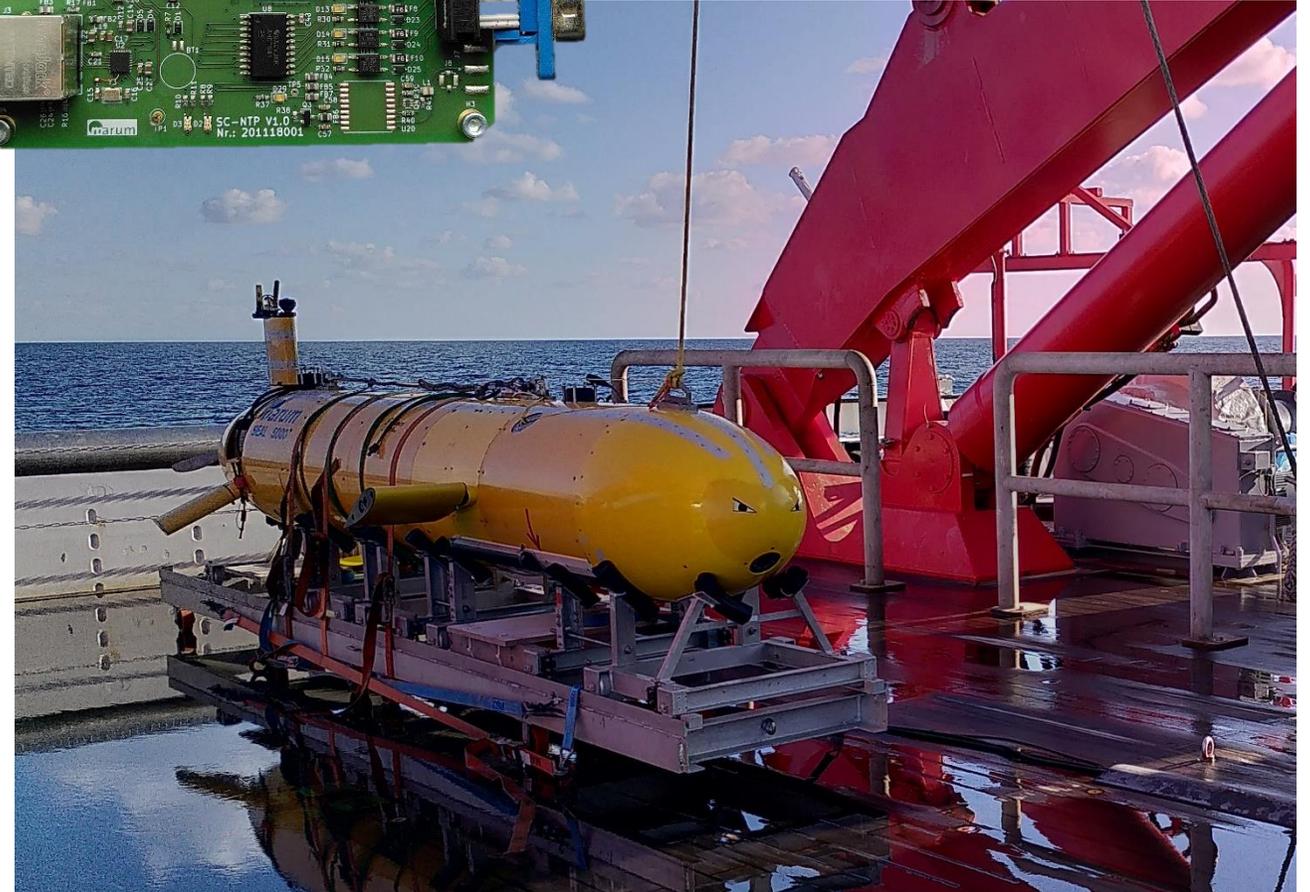
- main usage multibeam mapping
 - since 2014: Kongsberg EM2040
- replacements for outdated parts
- NTP server (developing)

2023:

- new RF antenna mold



MARUM NTP



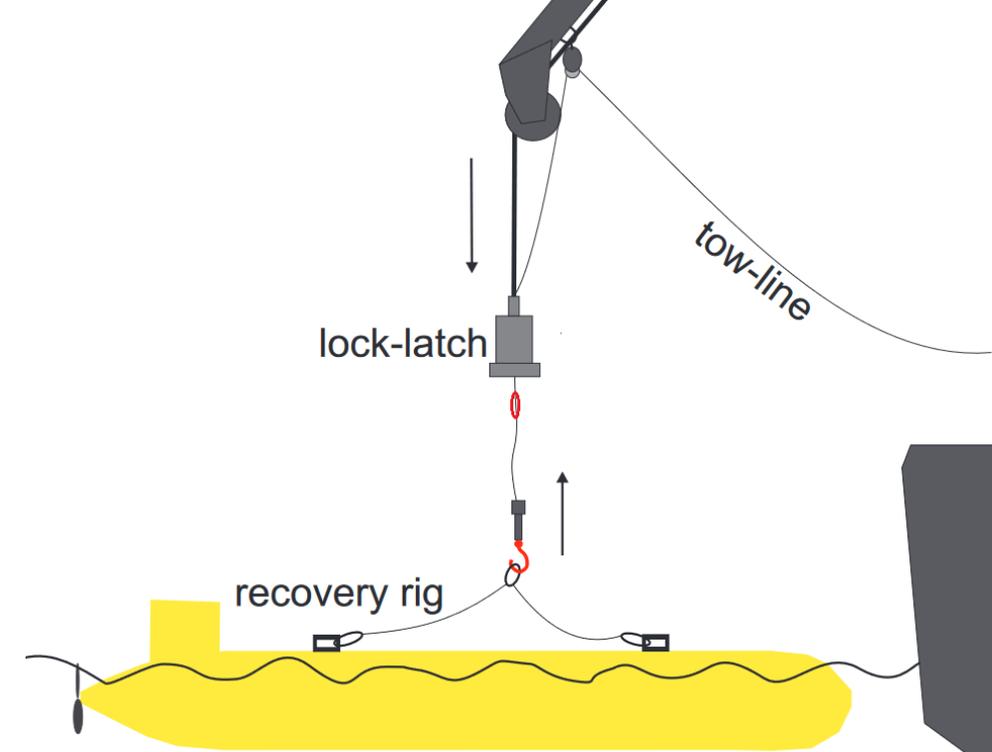
AUV Seal 5000

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2023:

- new RF antenna mold
- recovery system update



AUV Imgam

Atlas Electronics & MARUM

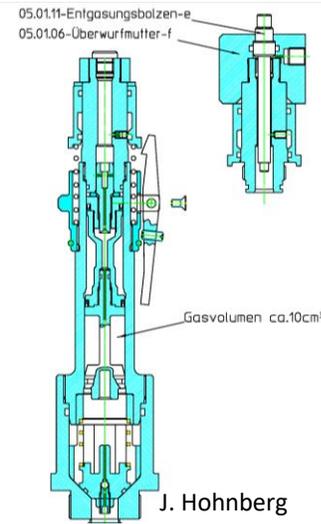
- purpose: gas detection and sampling
 - 2000m depth, 1,2t
- planned for carbon cycle projects
- 2022 tested:
 - surface and hovering ability
 - mission routines
 - firmware updates for deep diving & obstacle avoidance
- 2023 planned test:
 - deep diving at Norwegian Rim
 - gas detection + sampling
- future task: photo mosaic



AUV Imgam

Atlas Electronics & MARUM

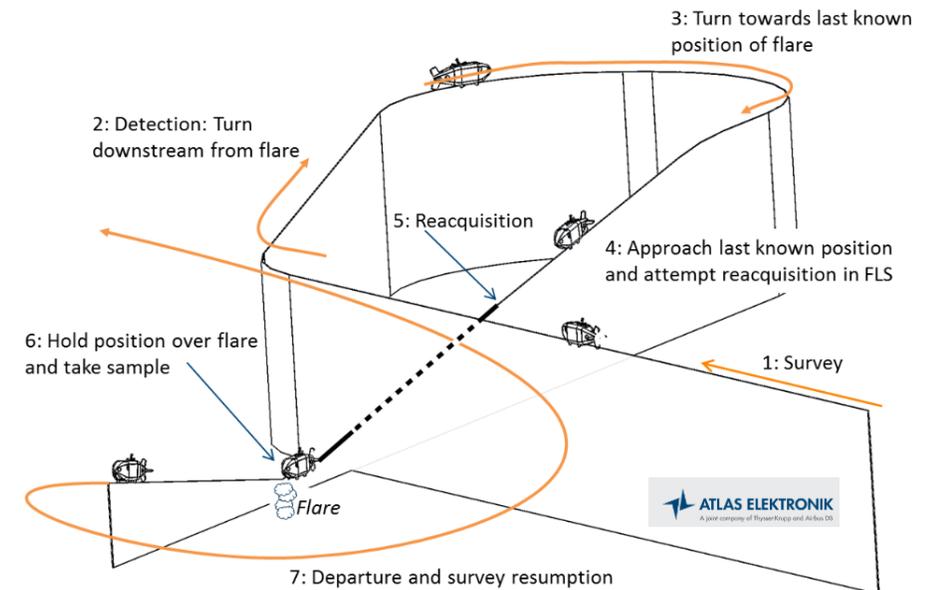
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Pressure stable gas sampler



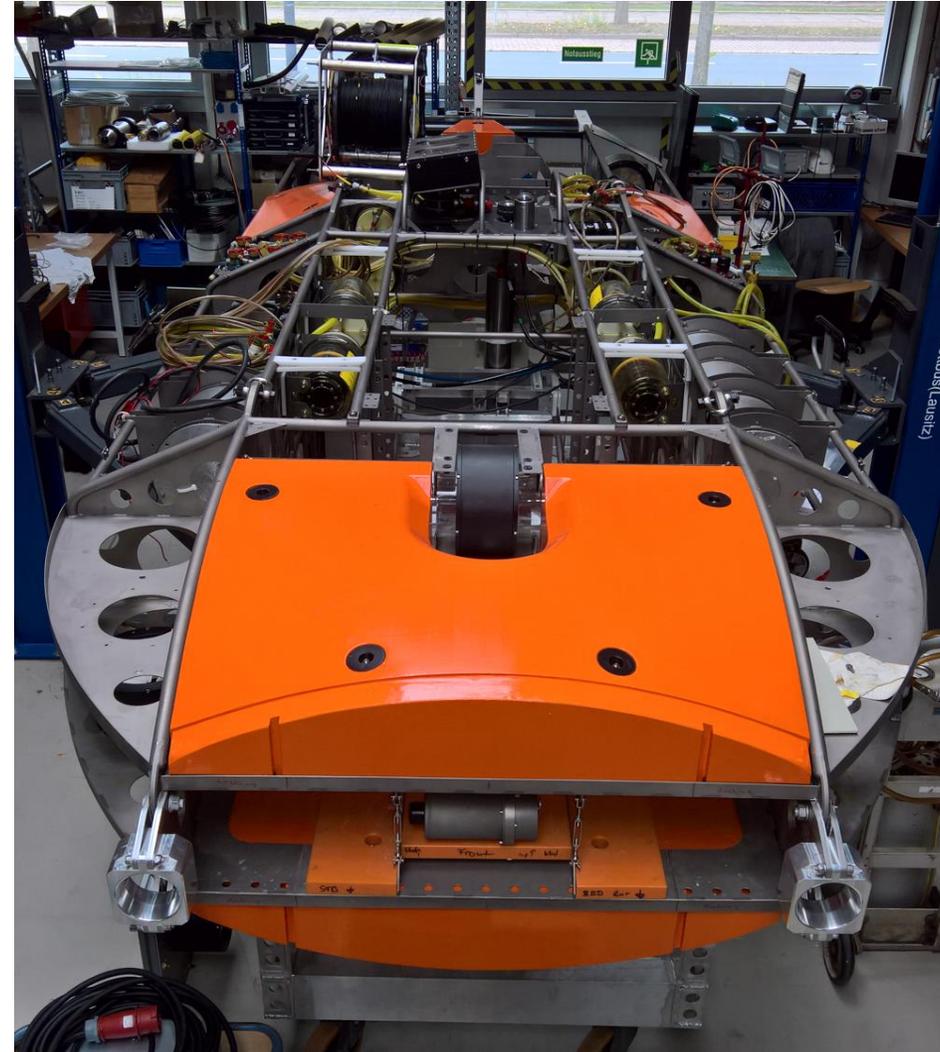
Step-wise breakdown of sampling sequence



H-ROV

MARUM

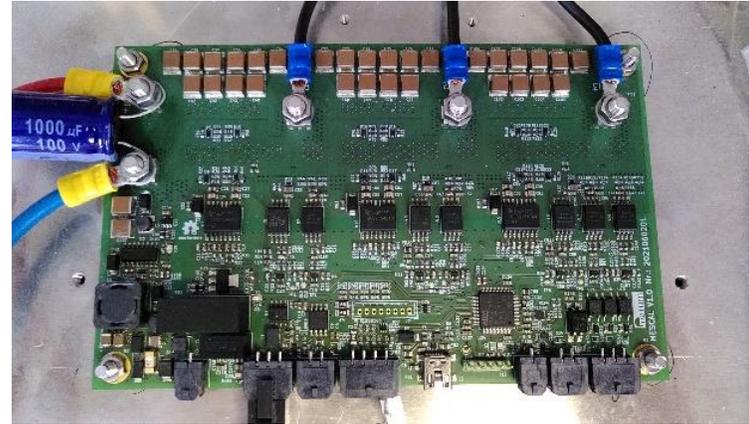
- Enitech electronics, thrusters and BMS removed
- New thrusters Copenhagen Subsea
- Motor driver development in-house (based on VESC)
- BMS based on Fox BMS Fraunhofer
 - adapt from car application to autonomous requirements
- New batteries, lithium batteries with oil-filled housing



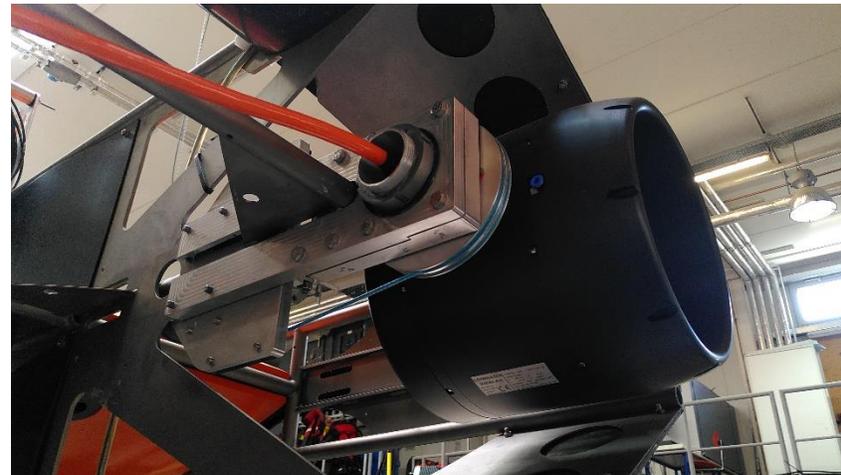
H-ROV

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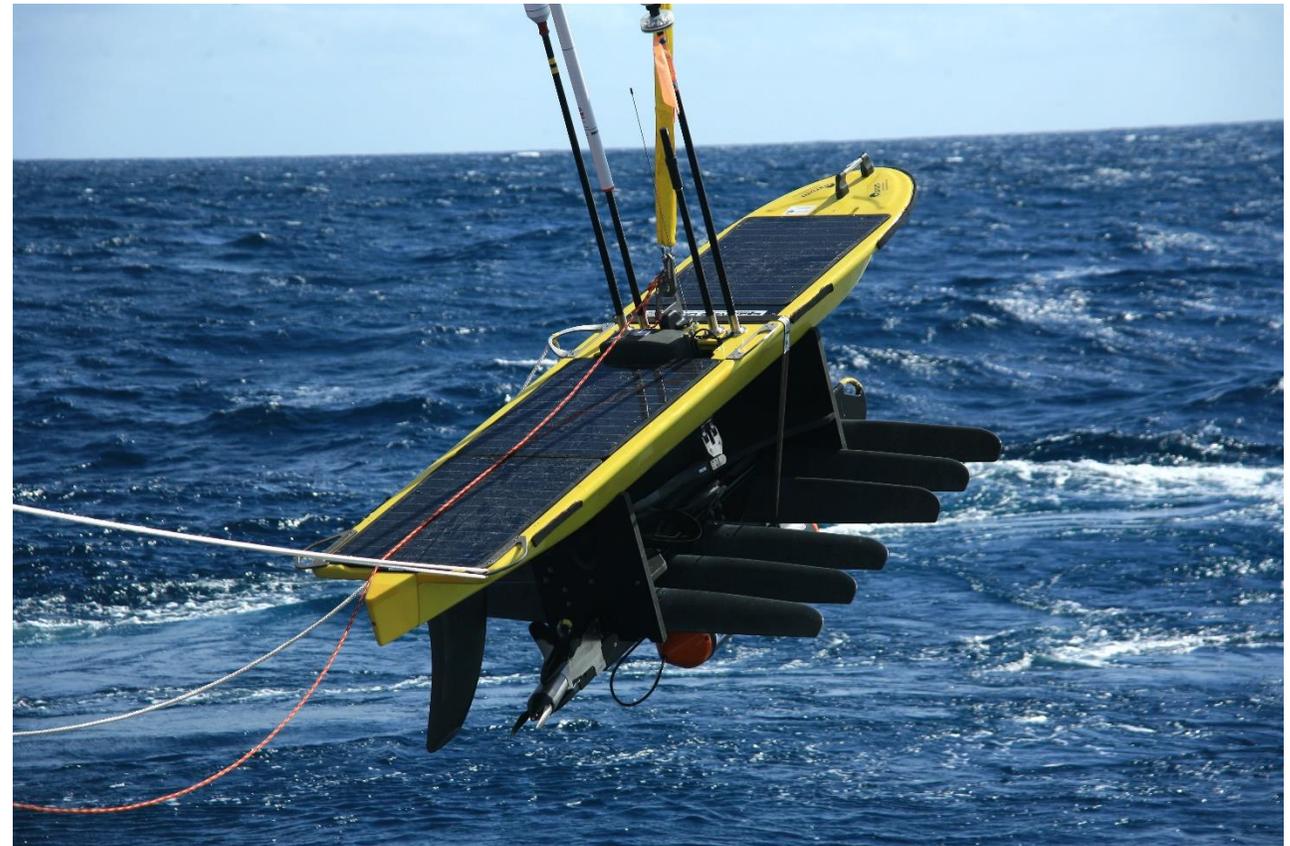
Motor controller
MARUM prototype
for 3 and 6 kW thrusters, 160VDC



Copenhagen Subsea

Wave glider

- Liquid Robotics SV3
- Deployed from harbor at Canary Island with PLOCAN
- Controlled from Bremen
- 2023 update of underwater components
- Further project for adaptive autonomy



ROV Quest replacement

- Schilling HD, 5000m
- Hydraulic propulsion
- Frame an umbilical: ability to lift 2t additional equipment
- Schilling telemetry fully compatible to Squid, H-ROV, MEBO, and Quest components
- Titan 4 and Atlas 7 arms
- 4K video from QUEST
- Delivery May 2023



Squid ROV (SAAB)

- Update with 4k
- Small system without control and work container
- Schilling node integration



MEBO (MARUM & Bauer)

- Drill rod magazine upgrade
- Sediment core catcher redesign
- Current drilling expedition at Greenland Sea





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Thank you for listening!