-4H- JENA engineering GmbH

Short Overview of 4H Jena

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-4H- JENA engineering GmbH

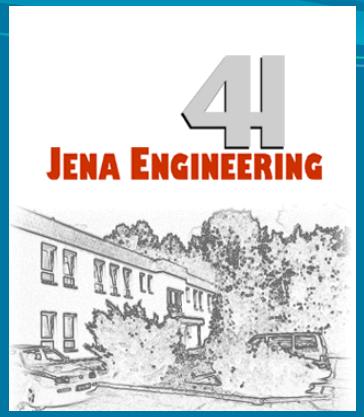
Scientific Cooperation:

Helmholtz-Zentrum Geesthacht
Zentrum für Material- und Küstenforschung

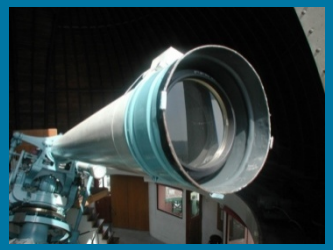
Contents

- Company Profile
  - marine measuring techniques
- FerryBox
- Measuring Containers
- Offshore Piles
- Lander
- SubSea in Network
- SubSea Winches
- Summary

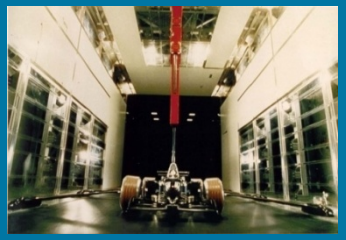
Company profile



Industrial services

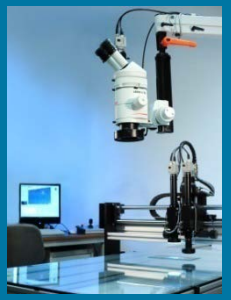


Astronomic giant equipment



Wind channel controlling and maintenance

Optical inspection techniques



Marine measuring techniques

Marine measuring techniques

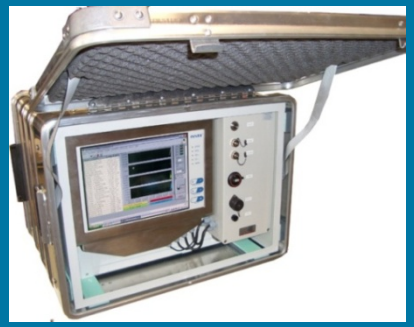
- Piles
- Buoys
- Fixed stations
- Mobile stations
- Probes
- data managment system

4H-Ferrybox family

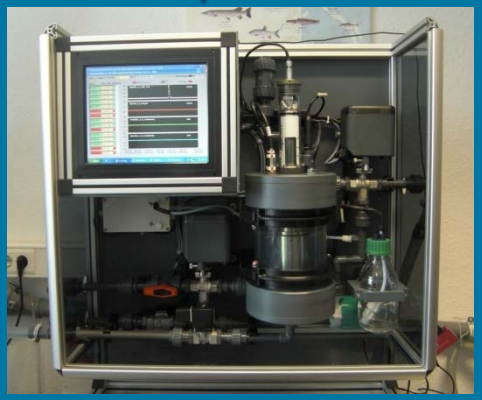
-4H- FerryBox I

-4H- FerryBox II

-4H- PocketBox



-4H- AquaControl

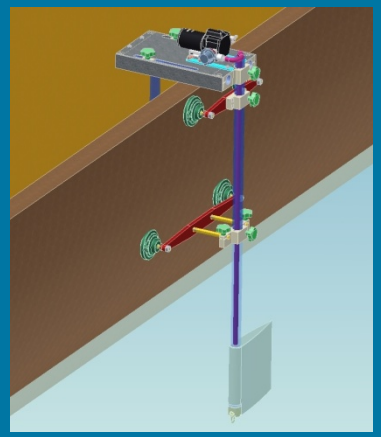


-4H-FerryBox I and II

- long-term water quality monitoring
- open system for various sensors
- suitable for nutrient analyzers and pCO2 systems
- easily extendable
- event-controlled water sampler
- effective antifouling procedures
- position control

-4H-PocketBox

- developed for field experiments
- portable system for operation on small boats
- ~25 kg transportable via airplane
- low power consumption



Applications -4H- Pocketbox, Bay of Paranaguá

Parameters:
T, S, DO, pH, Chl-a, Turbidity, CDOM

(Photo.: HZG)

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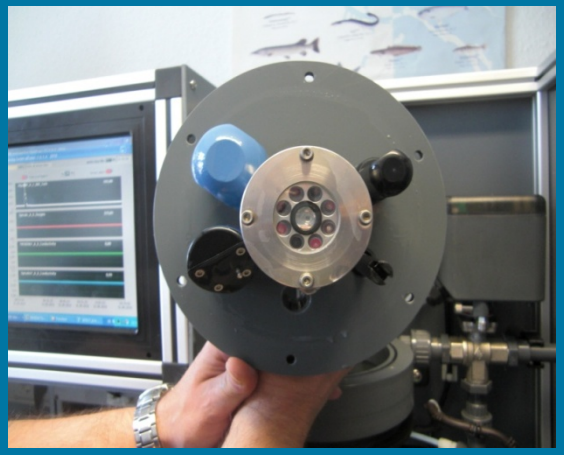
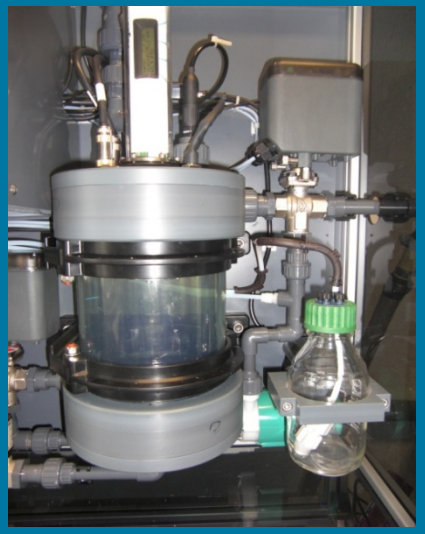
Parameters:
T, S, DO, pH, Chl-a, Turbidity, CDOM

(Photo.: HZG)

-4H- Aquacontrol

- water quality monitoring for fish farms
- limited sensors
- antifouling device available
- Top-mounted sensor



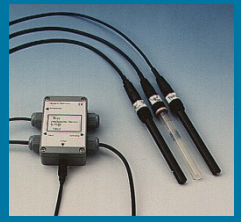


Fish and coral tank at ZMT

Modular and Expandable

Parameters:

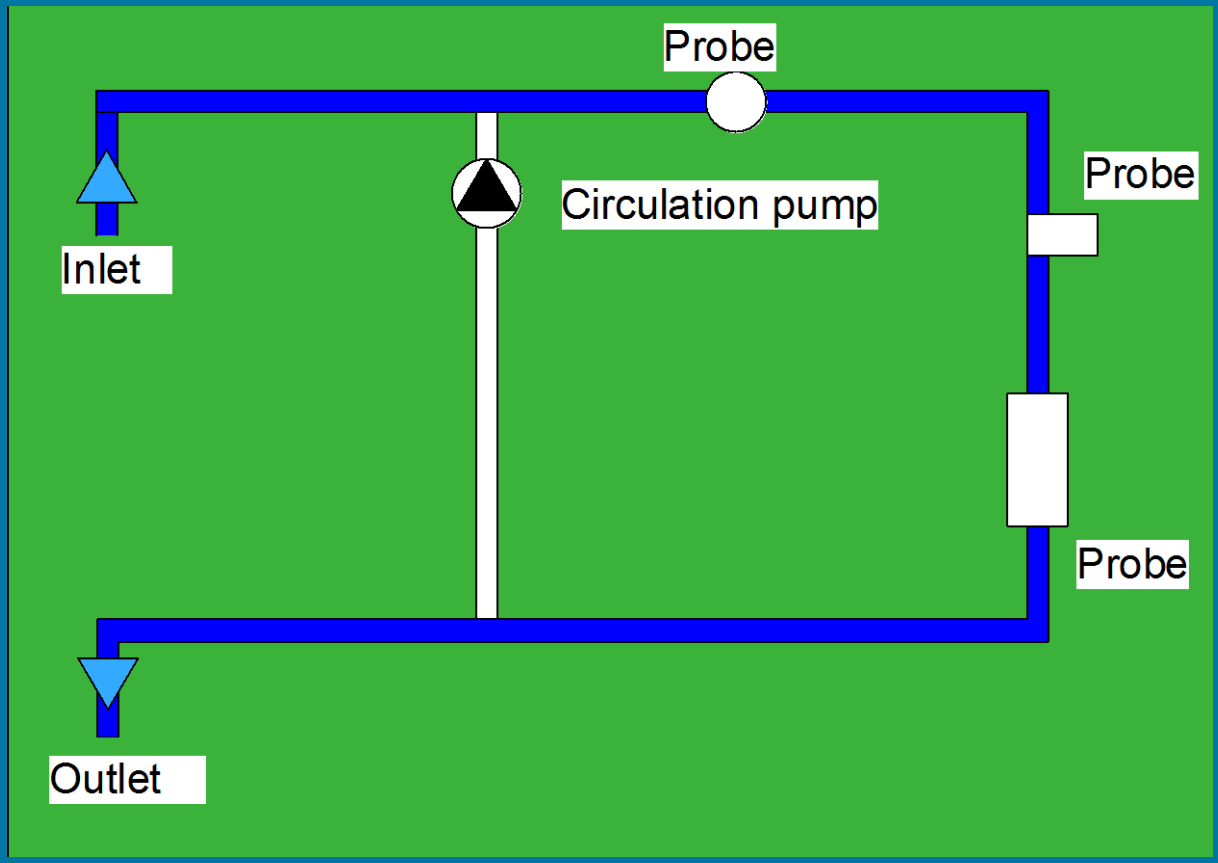
- temperature
- salinity
- DO
- pH
- algae classes
- chlorophyll-a
- turbidity
- nutrients
- pCO2
- weather stations, …



Customers configure their own systems

Antifouling Concept of the 4H Ferrybox

Principle of the water system

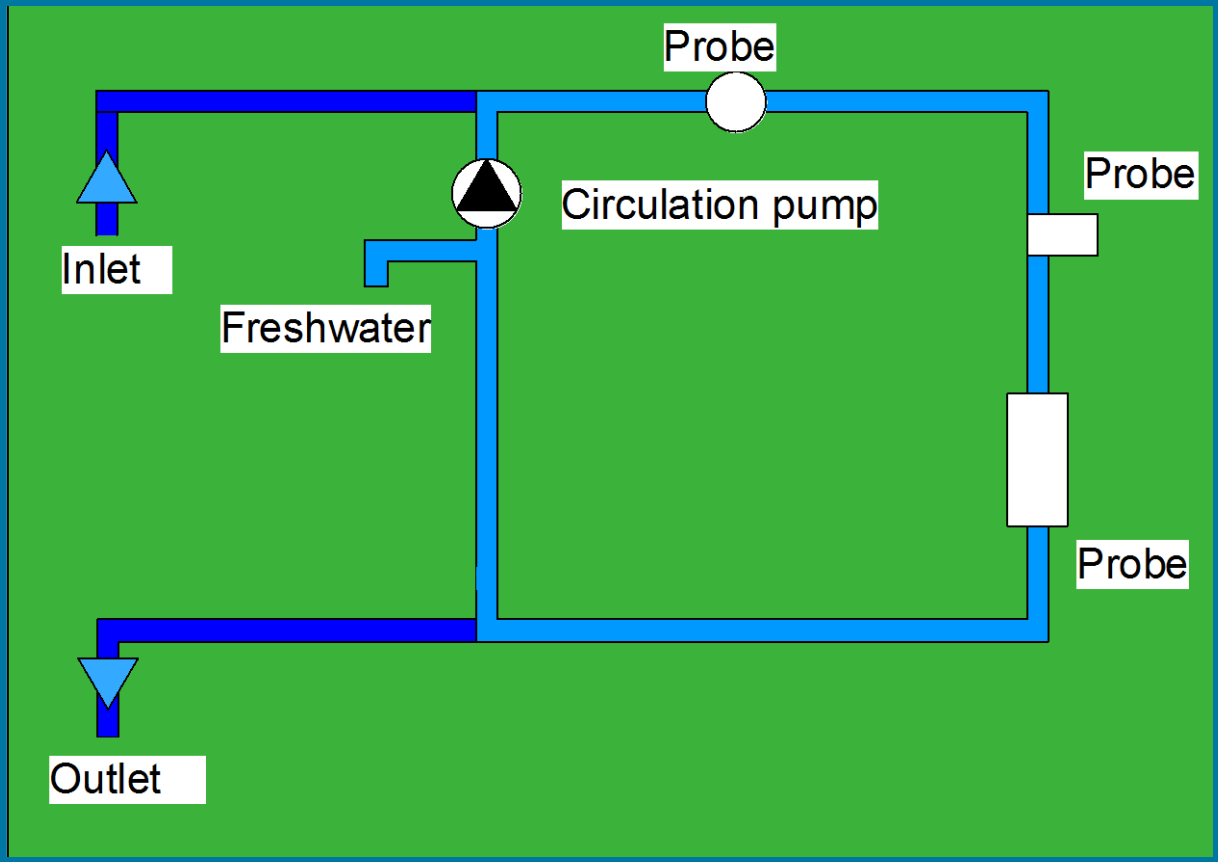


Antifouling Concept of the 4H Ferrybox

Principle of the water system

Antifouling:

1. Freshwater

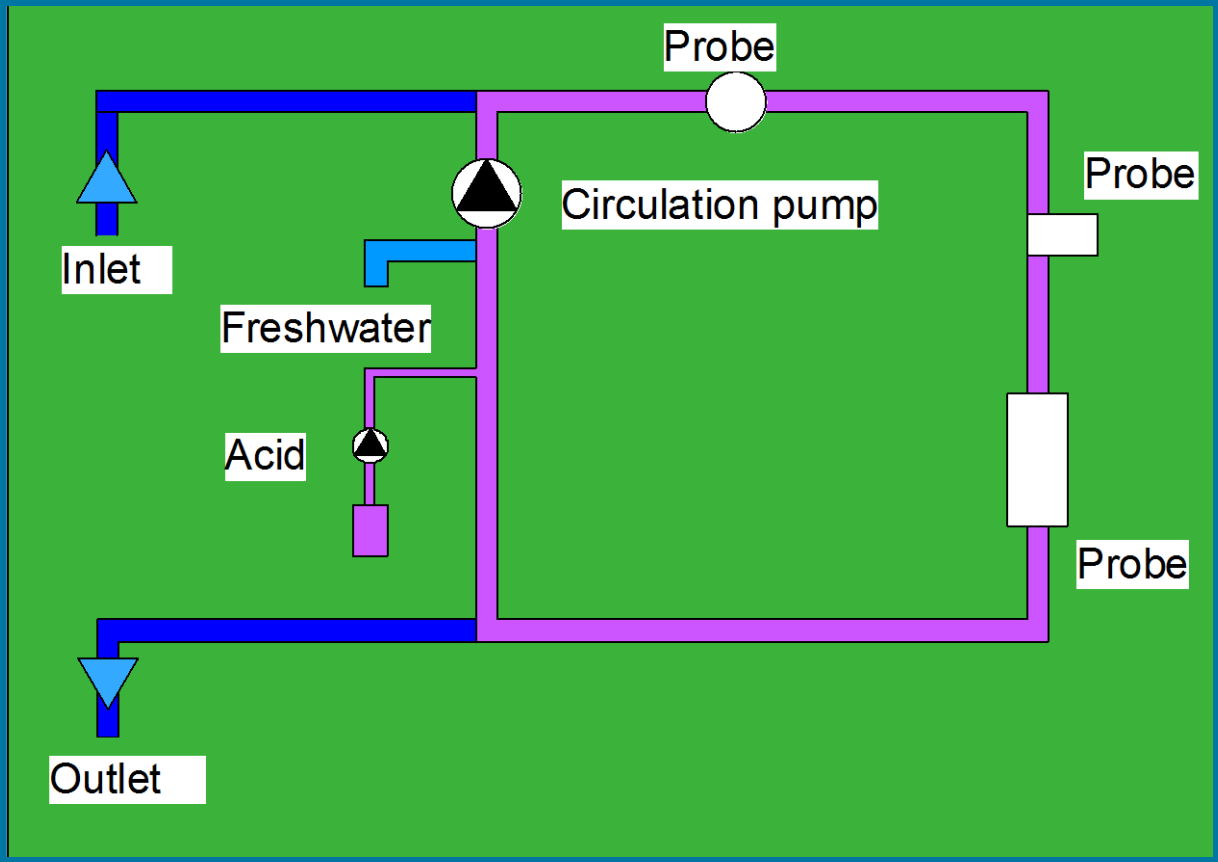


Antifouling Concept of the 4H Ferrybox

Principle of the water system

Antifouling:

1. Freshwater
2. Acid

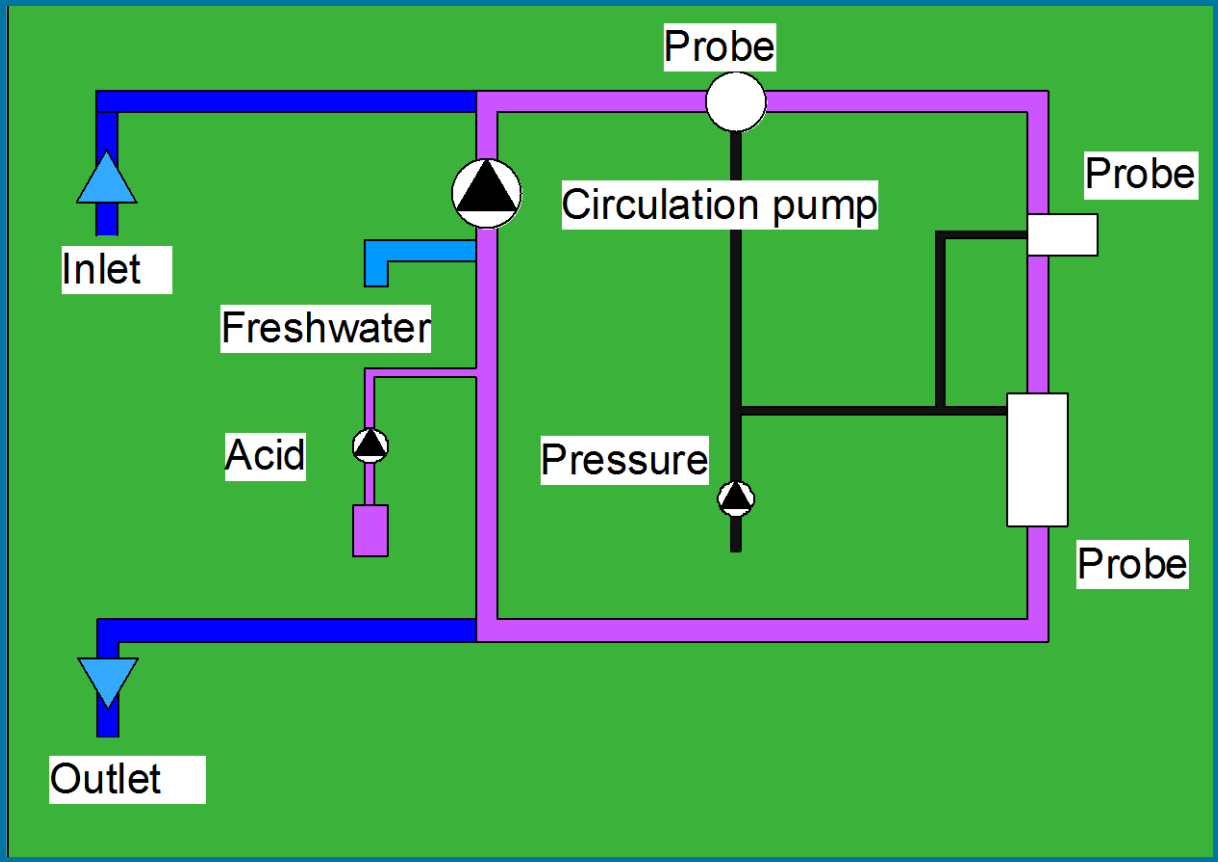


Antifouling Concept of the 4H Ferrybox

Principle of the water system

Antifouling:

1. Freshwater
2. Acid
3. High pressure

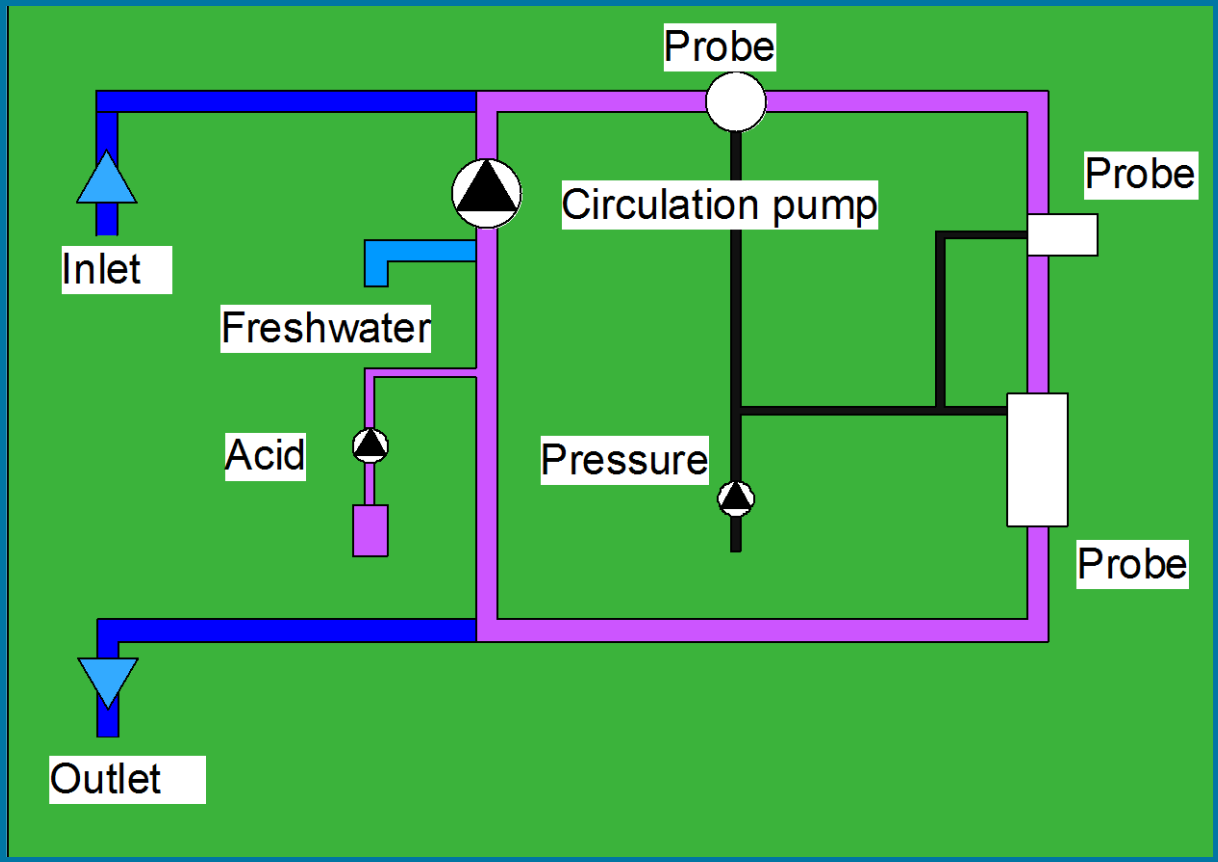


Antifouling Concept of the 4H Ferrybox

Principle of the water system

Antifouling:

1. Freshwater
2. Acid
3. High pressure
4. Chlor
5. Backflush



2 weeks, no freshwater available

Debubbler,
December 2007, Paranaguá

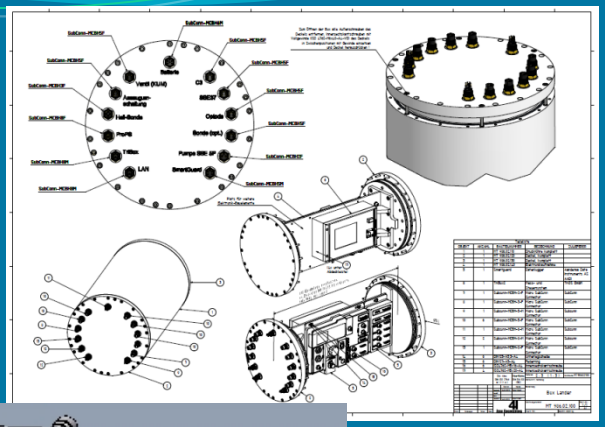
Debubbler,
January 2008 with no antifouling

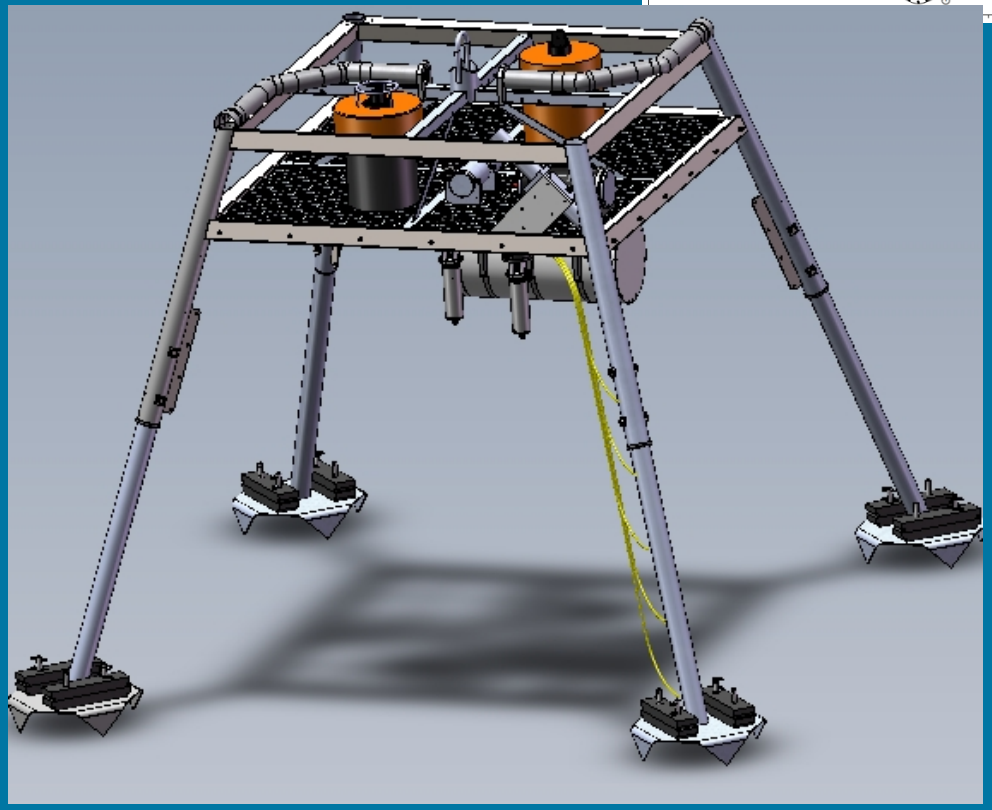
Cleaning results

Seapoint chl-a after one year

Flow-Through Landersystem

Near bottom
Microstructure of
Nutrients, DO, Salinity
and CHL-a

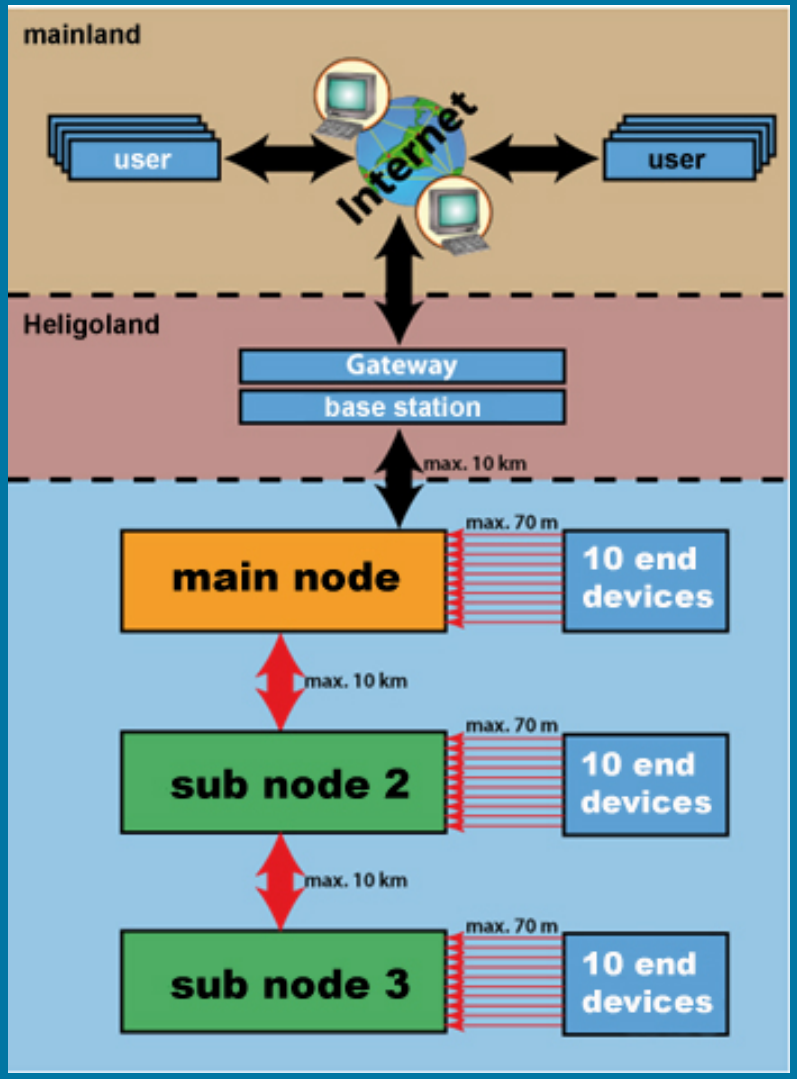


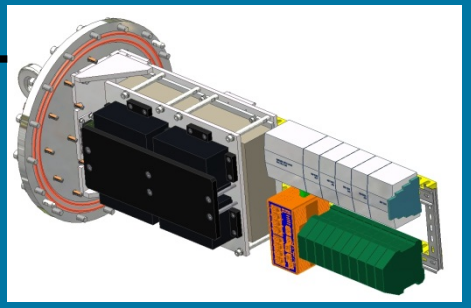


Parameters:
T, S, DO, Chl-a, Turbidity,
NO2/NO3

In Cooperation with KUM

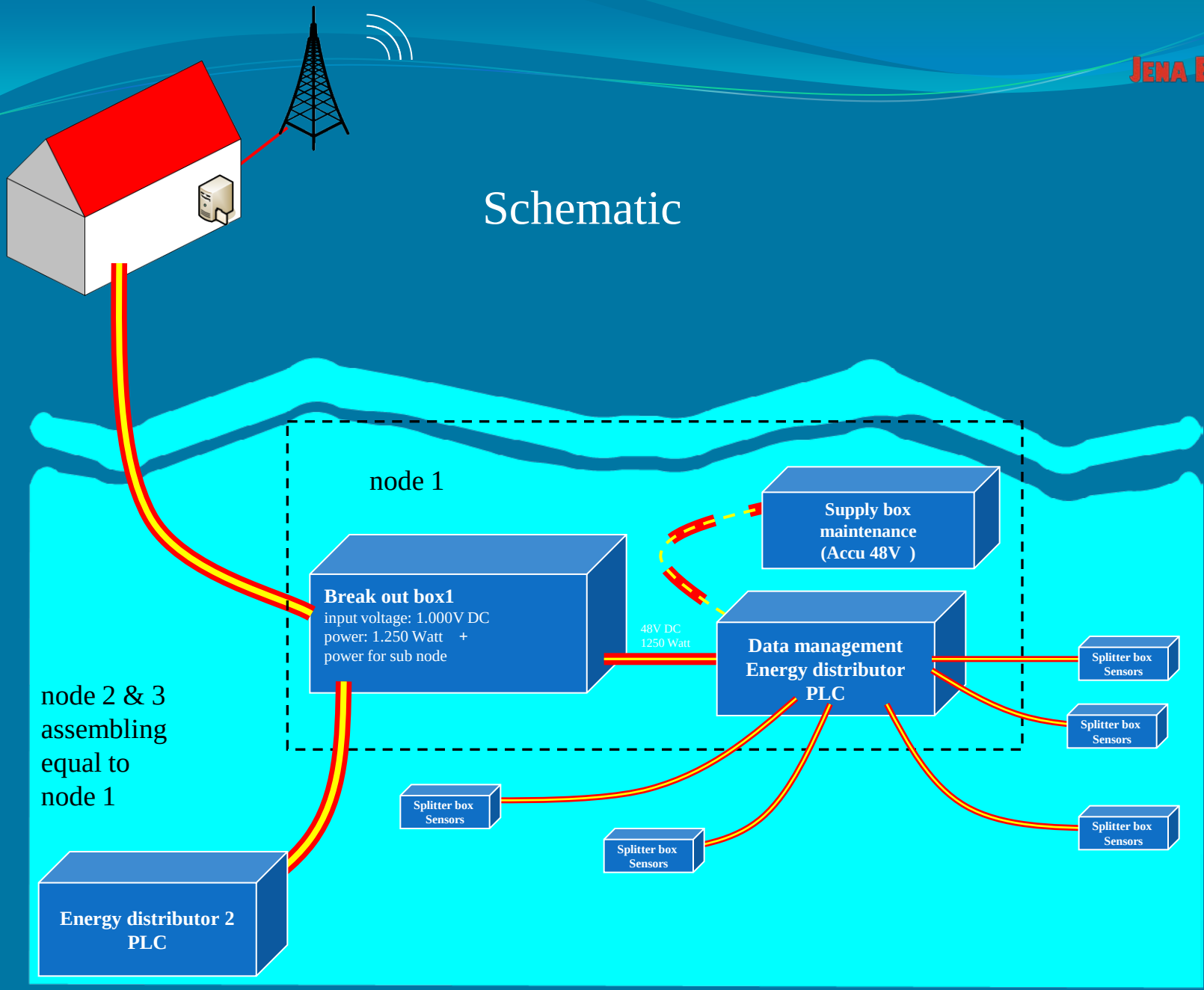
SubSea Network



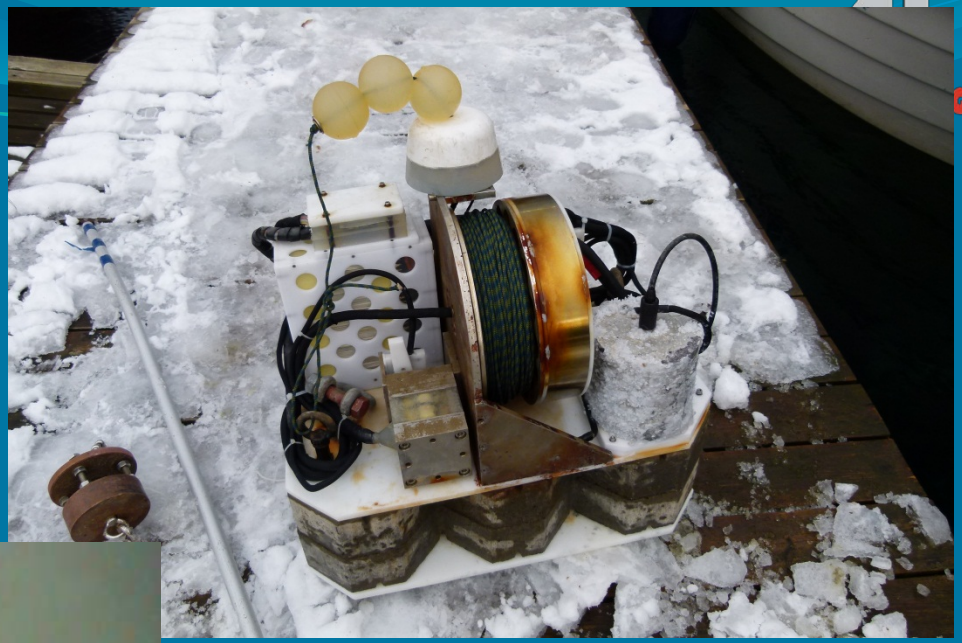


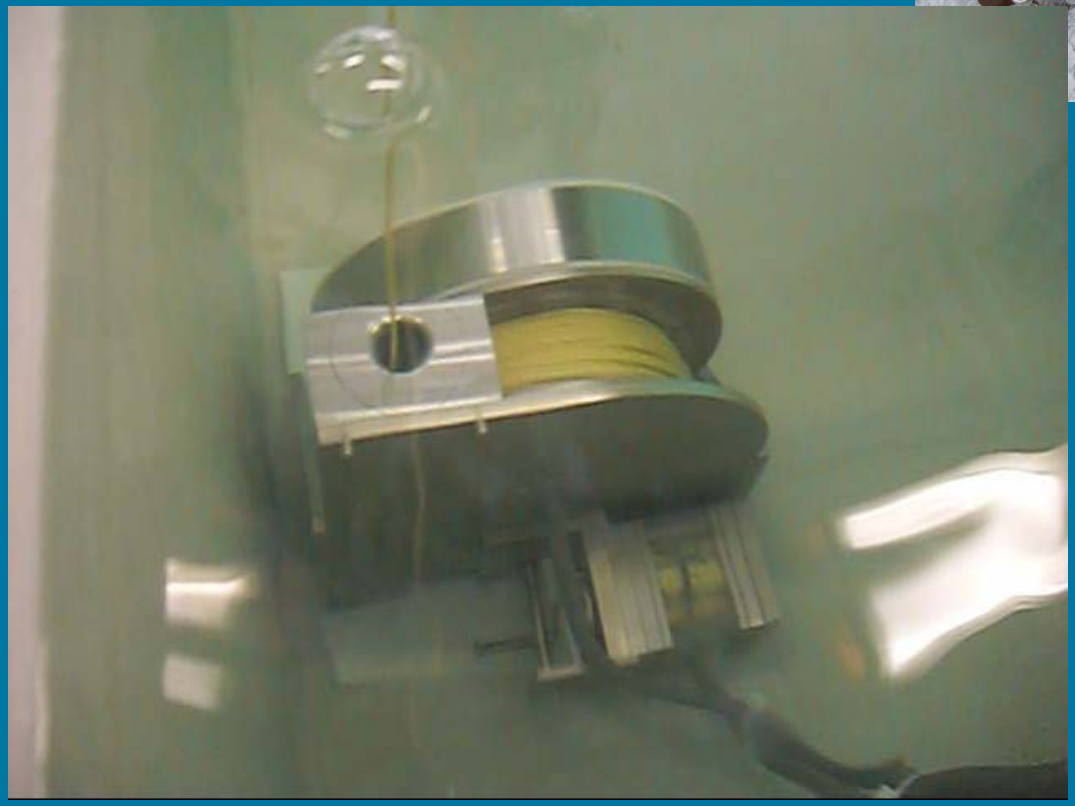
In Cooperation with AWI

Schematic


node 1
Supply box
maintenance
(Accu 48V)
Break out box1
input voltage: 1.000V DC
power: 1.250 Watt +
power for sub node
48V DC
1250 Watt
Data management
Energy distributor
PLC
Splitter box
Sensors
Splitter box
Sensors
Splitter box
Sensors
Splitter box
Sensors
Splitter box
Sensors
node 2 & 3
assembling
equal to
node 1
Energy distributor 2
PLC

SubSea winches
for multiprobe application





Field test in Norway, - Dec. 2011

Summary

- The 4H-Montoring Systems provides solutions to most of the problems associated with long-term in situ monitoring of rivers, estuaries, coastal zones and open sea.
- The modular systems combines high flexibility in the choice of sensor types and the possibility for automatic and remote-controlled operation.

Thank you very much
for your attention