-4H- FerryBox Family:

Typical applications and technical specifications of different types of FerryBoxes

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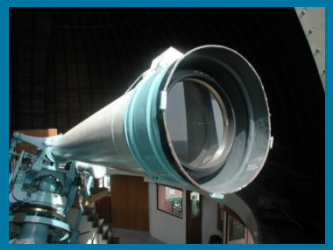
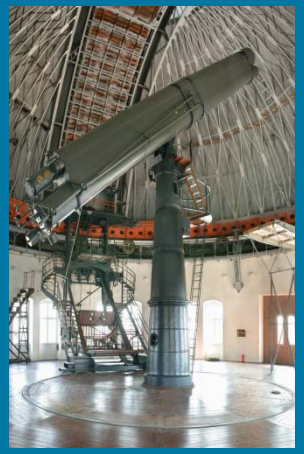
Zentrum für Material- und Küstenforschung

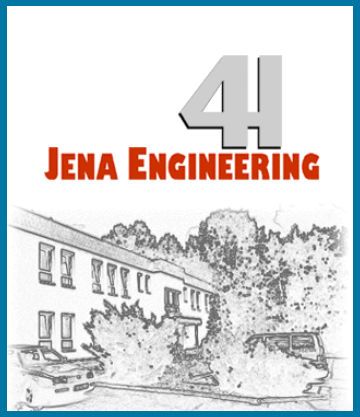
Contents

- Company profile
  - Marine measuring techniques
- -4H-FerryBox Family
  - Modularity
  - Fouling/antifouling
  - Software features
  - Applications
- Summary

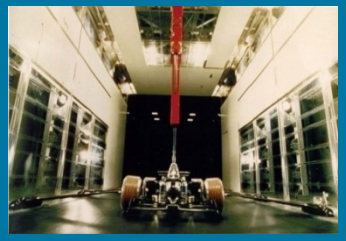
Company profile







Optical inspection techniques



Industrial services

Marine measuring techniques

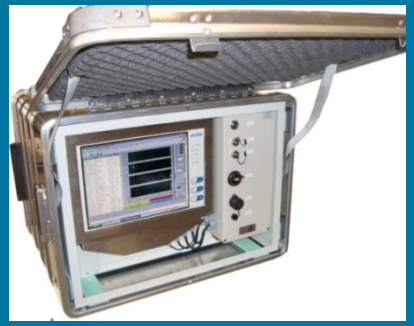
Marine measuring techniques

4H-Ferrybox family

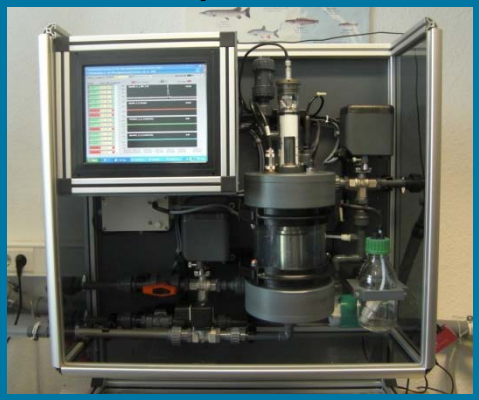
-4H- FerryBox I

-4H- FerryBox II

-4H- PocketBox



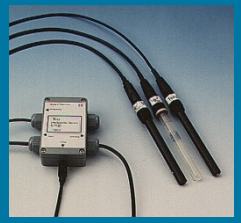
-4H- AquaControl



Modular and Expandable

Parameters:

- Temperature
- Salinity
- DO
- pH
- Algae classes
- Chlorophyll-a
- Turbidity
- Nutriens
- pCO2
- Weatherstations, …



The Customer configure their own system

Fouling the big problem for sensors and systems

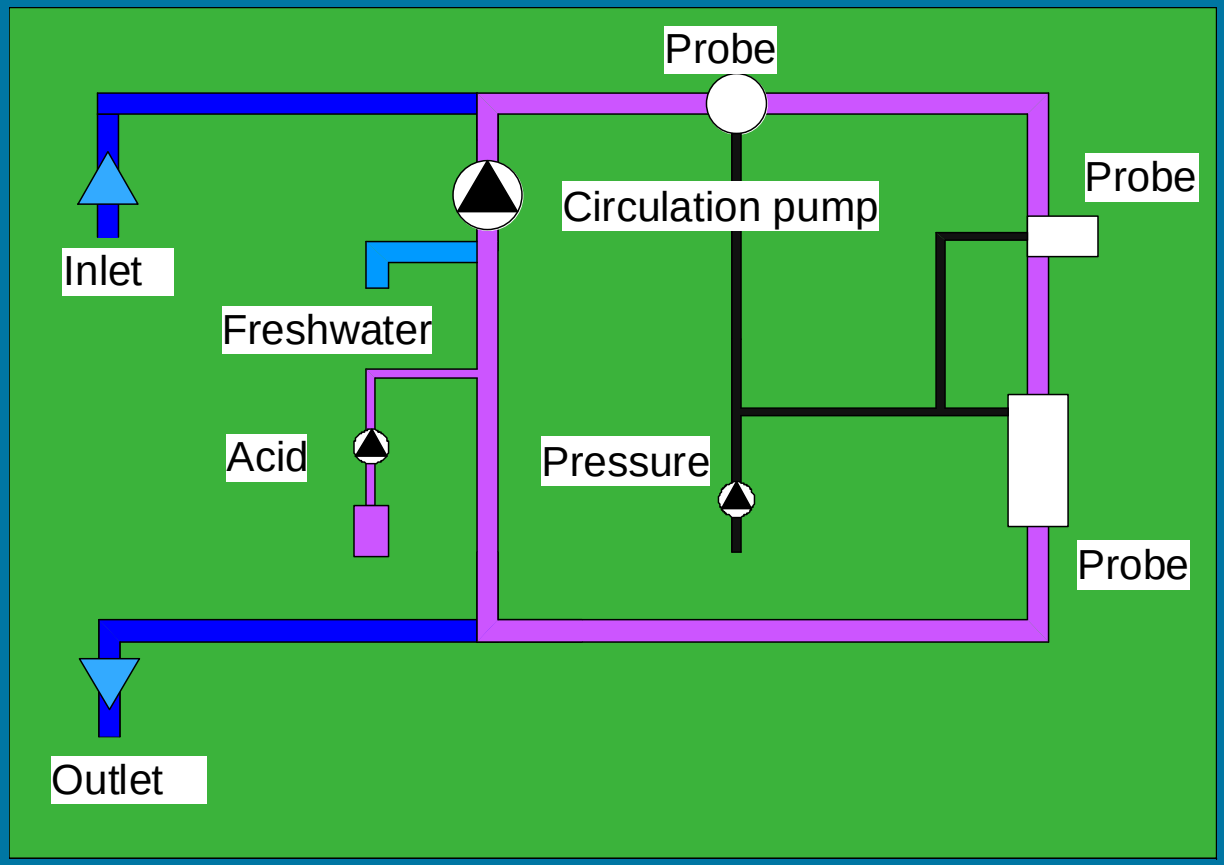
- Anti-fouling technology is one of the most important support technologies for autonomous instruments
- Protection against or prevention of possible fouling is of great importance for a maintenance-free function over a longer period (long-term stability)
- Necessary for height data quality

Antifouling concept of the 4H Ferrybox

Principle of the water system

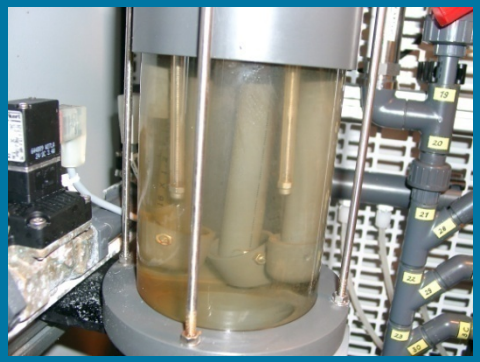
Antifouling:

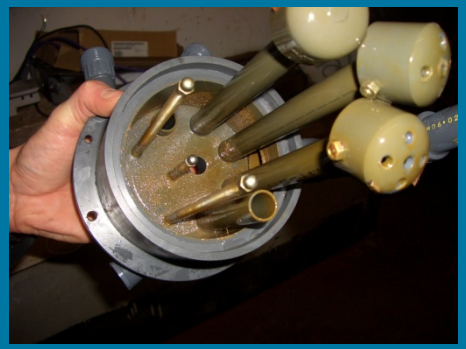
1. Freshwater
2. Acid
3. High pressure
4. Chlor
5. Back Flash



Cleaning results

Debubbler after 2 years
without manual cleaning





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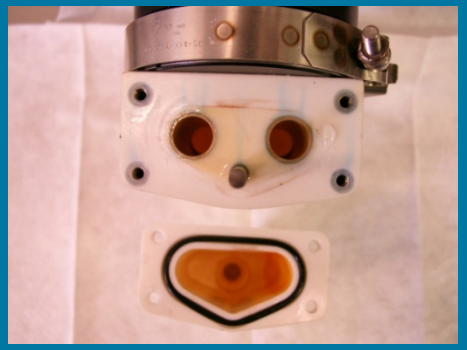
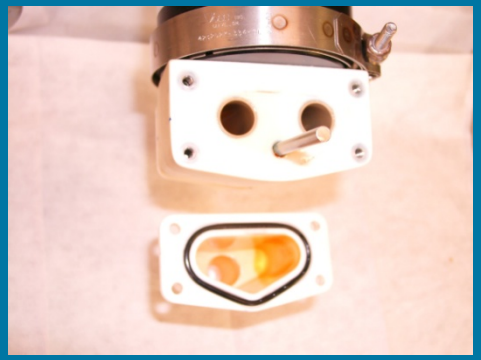
Iron impurities
Cleaning with oxalic acid





© Rijkswaterstaat

2 weeks no freshwater available

Debubbler December 2007 Paranaguá

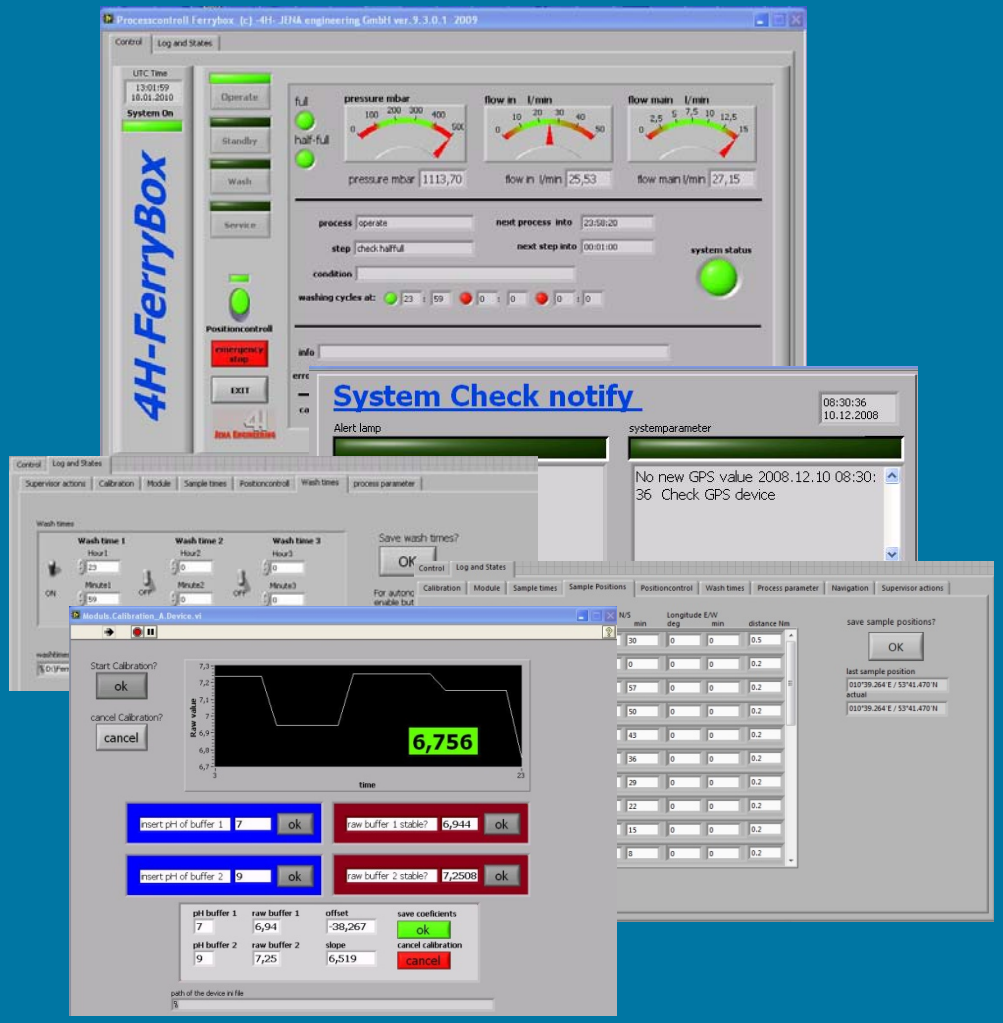
Debubbler January 2008 with no antifouling

Cleaning results

Seapoint Chl-a after one year

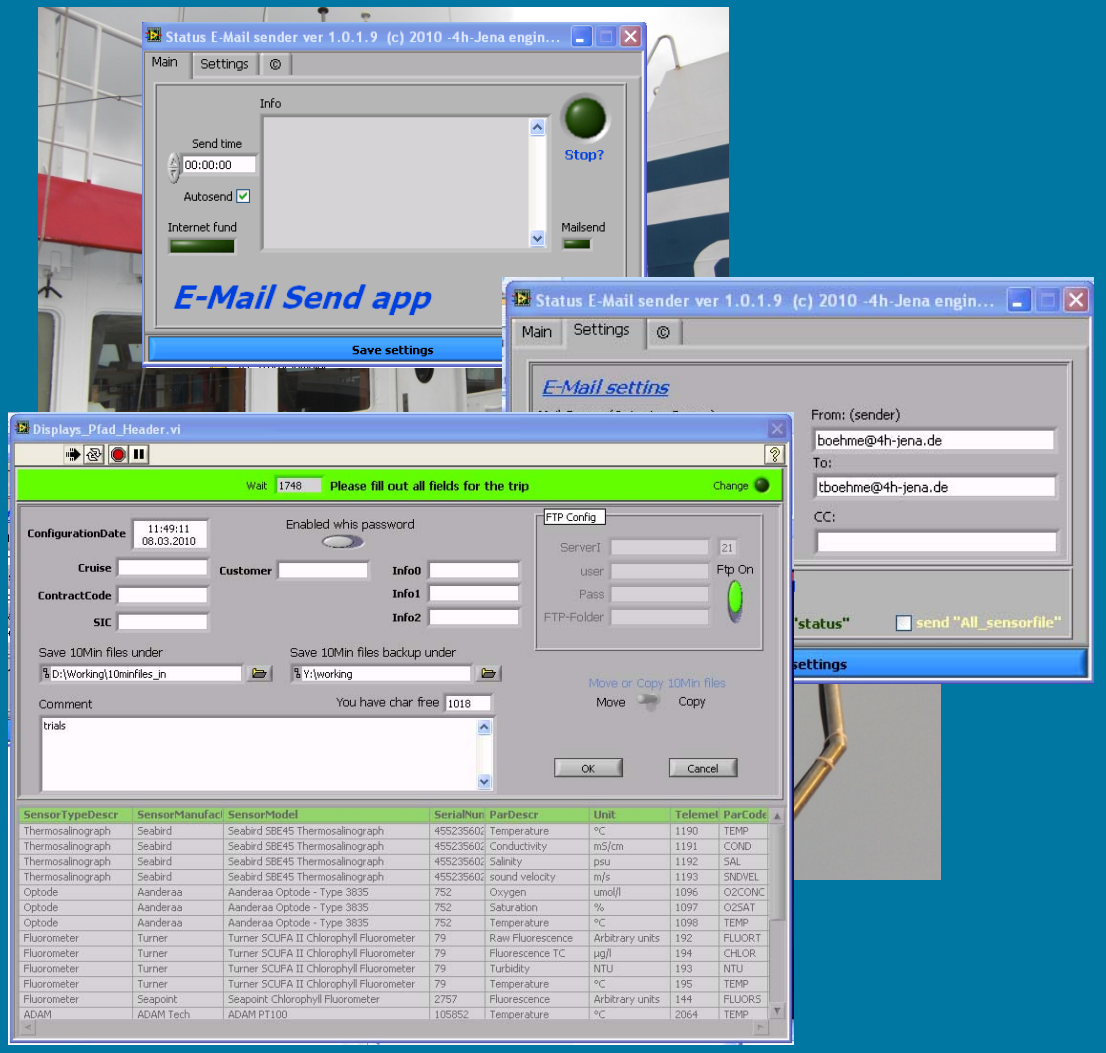
Process controlled Water system

- Datasystem based on LabVIEW
- Intuitive operation
- Soft SPS tools
- Error handling
  - Back flush, SMS,…
- Event and position controlled
- Calibration

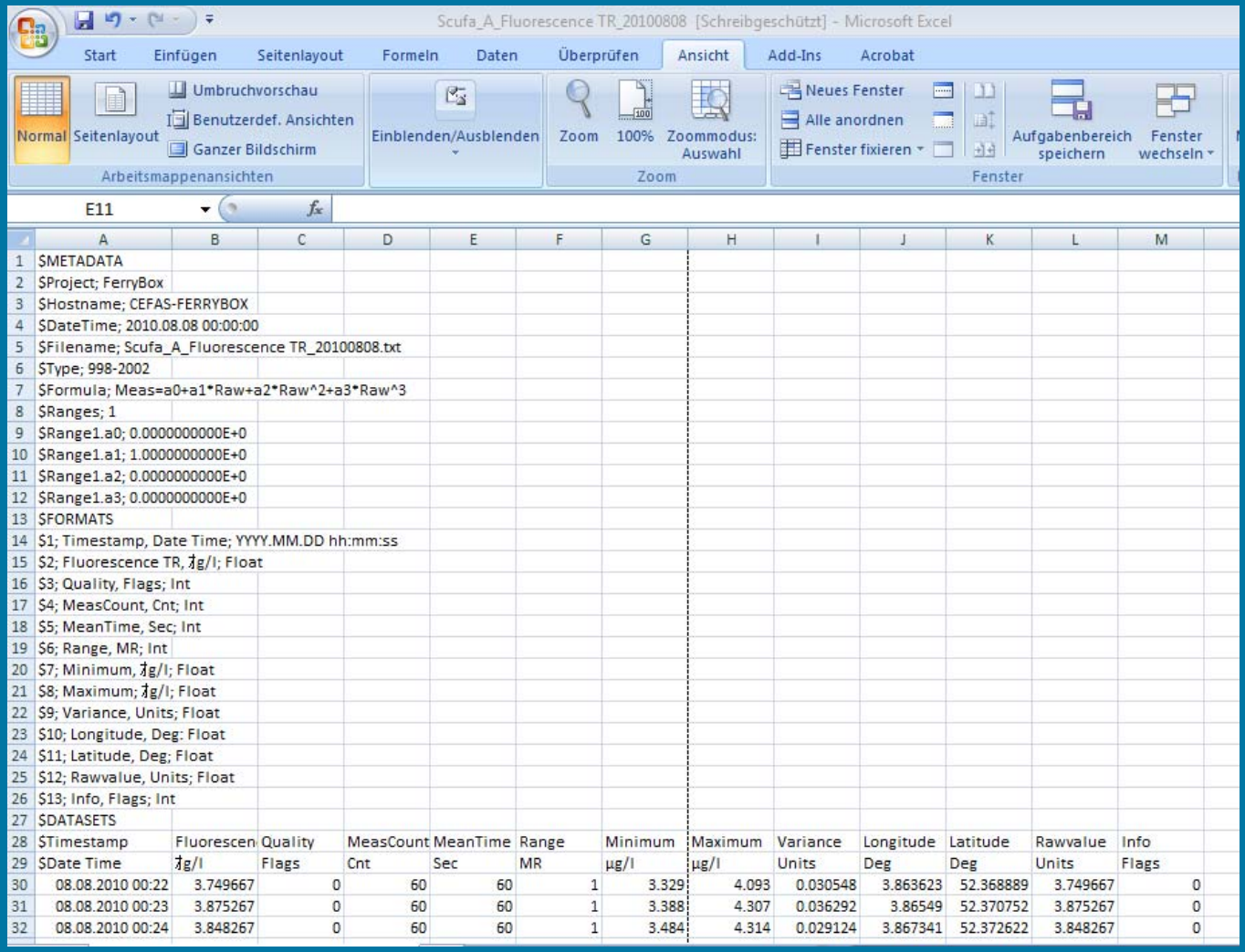


Data Transmission

- Telemetry
  - UMTS/G3
  - Iridium
  - WLAN
- Email
- FTP
- Remote control



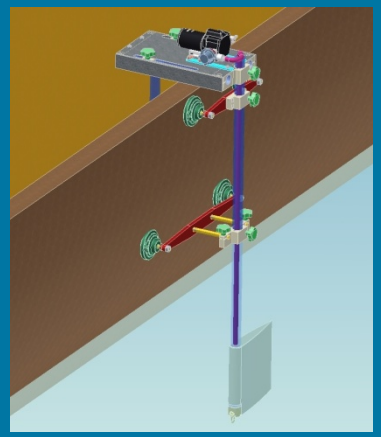
Data quality and Database exchange



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	$METADATA												
2	$Project; FerryBox												
3	$Hostname; CEFAS-FERRYBOX												
4	$DateTime; 2010.08.08 00:00:00												
5	$Filename; Scufa_A_Fluorescence TR_20100808.txt												
6	$Type; 998-2002												
7	$Formula; Meas=a0+a1*Raw+a2*Raw^2+a3*Raw^3												
8	$Ranges; 1												
9	$Range1.a0; 0.0000000000E+0												
10	$Range1.a1; 1.0000000000E+0												
11	$Range1.a2; 0.0000000000E+0												
12	$Range1.a3; 0.0000000000E+0												
13	$FORMATS												
14	$1; Timestamp, Date Time; YYYY.MM.DD hh:mm:ss												
15	$2; Fluorescence TR, µg/l; Float												
16	$3; Quality, Flags; Int												
17	$4; MeasCount, Cnt; Int												
18	$5; MeanTime, Sec; Int												
19	$6; Range, MR; Int												
20	$7; Minimum, µg/l; Float												
21	$8; Maximum; µg/l; Float												
22	$9; Variance, Units; Float												
23	$10; Longitude, Deg: Float												
24	$11; Latitude, Deg; Float												
25	$12; Rawvalue, Units; Float												
26	$13; Info, Flags; Int												
27	$DATASETS												
28	$Timestamp	Fluorescen	Quality	MeasCount	MeanTime	Range	Minimum	Maximum	Variance	Longitude	Latitude	Rawvalue	Info
29	$Date Time	µg/l	Flags	Cnt	Sec	MR	µg/l	µg/l	Units	Deg	Deg	Units	Flags
30	08.08.2010 00:22	3.749667	0	60	60	1	3.329	4.093	0.030548	3.863623	52.368889	3.749667	0
31	08.08.2010 00:23	3.875267	0	60	60	1	3.388	4.307	0.036292	3.86549	52.370752	3.875267	0
32	08.08.2010 00:24	3.848267	0	60	60	1	3.484	4.314	0.029124	3.867341	52.372622	3.848267	0

-4H-PocketBox

- Developed for field experiments
- Portable system for operation on small boats
- ~25 kg transportable via airplane
- Low power consumption

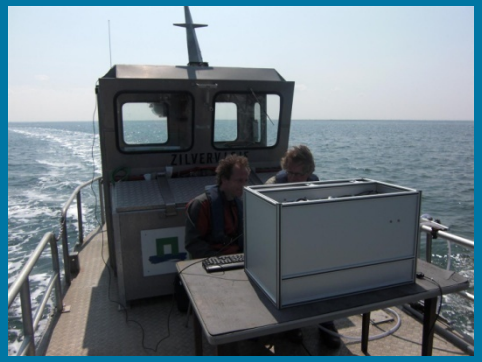


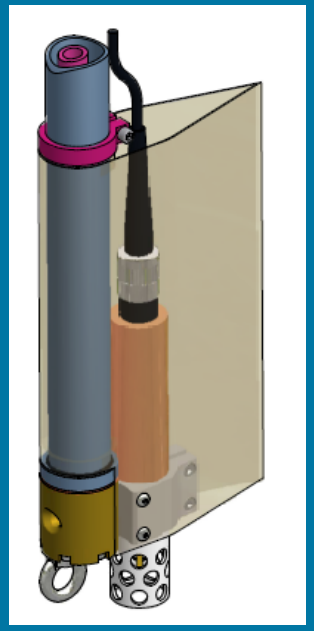
Applications -4H- Pocketbox Bay of Paranaguá

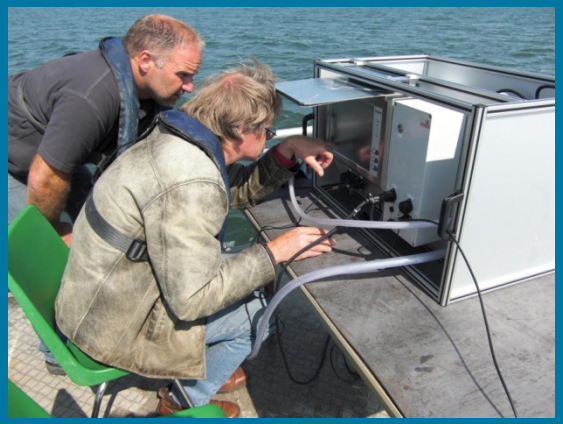
Parameter:
T, S, DO, pH, Chl-a,Turbidity, CDOM

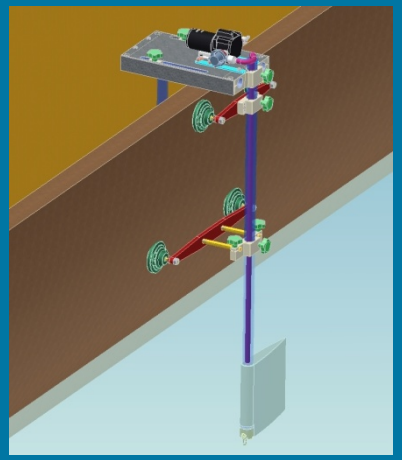
(Photo.: HZG)

Applications -4H- PocketBox NIOS Texel









Parameter:

T, S, DO, pH, Algeagroups, Absorbtion

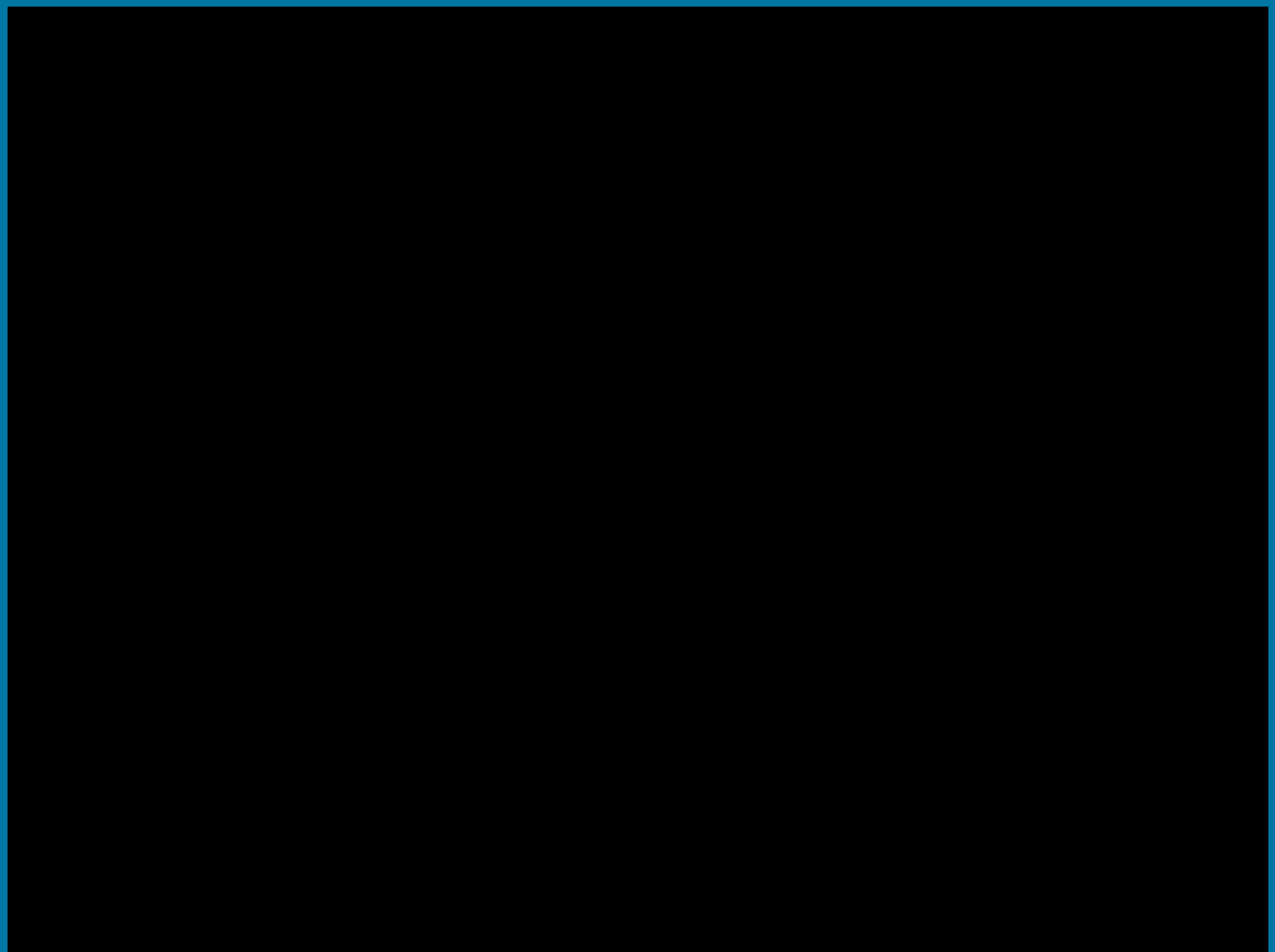
-4H-FerryBox I and II

- Long term water quality monitoring
- Open system for many Sensors
- Suitable for nutrient analysers and pCO2 systems
- Easy extantionable
- Event controlled Water sampler
- Effective antifouling procedures
- position control

Applications -4H- FerryBox I mobile monitoring

FerryBoxes for the research Institutes IFREMER and CRNS

Parameter:
T, S, DO, Chl-a, CDOM, turbidity, pH,
Inlet temperature, pCO2, water sampler



Applications -4H- FerryBox I stationary monitoring

Continues measurements
of metrological, oceanographic
and biological parameters
at the Elbe Estuary (HZG)

Parameter:
T, S, DO, pH, Chl-a, turbidity, inlet temperature,
Tide gauge, metrology, water sampler, webcam, sediment trap

Applications -4H- FerryBox II mobile monitoring

FerryBox as
scientific equipment
on the Polarstern
Email as Data export

Parameter:
T, S, DO, pCO2, pH, Chl-a, turbidity,
lilet temperature, water sampler,
nutrients (NH_4^+, P, NO_3^-/NO_2^-, Si_xO_y)

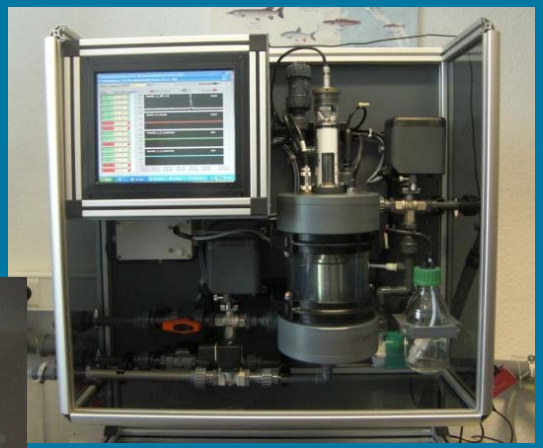
Applications -4H- FerryBox II stationary monitoring

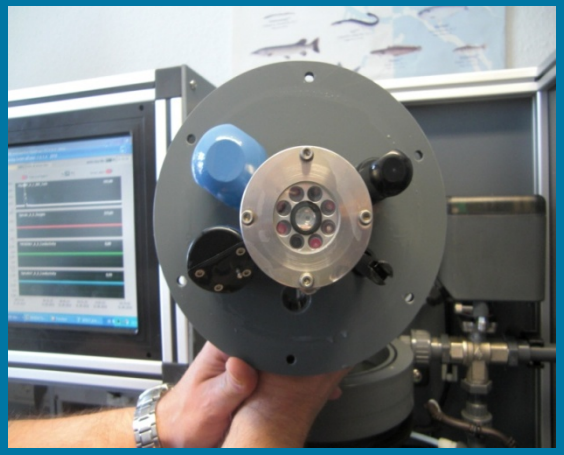
FerryBox as monitoring equipment on the Fino III Platform

Parameter:
T, S, DO, pH, Chl-a,Turbidity, Nutriens, watersampler

-4H- Aquacontrol

- water quality monitoring for fish farms
- Limited sensors
- Ligth antfouling avalible
- Top mounted Sensor





Applications -4H- AquaControl

Fish and coral tank at ZMT

Parameter:
T, S, Redox, pH, Chl-a,Turbidity, Nutriens, watersampler

Summary

- The 4H-FerryBox provides solutions to most of the problems associated with long-term in- situ monitoring of rivers, estuaries, coastal zones and open sea.
- The modular flow-through system combines high flexibility in the choice of sensor-types and –methods with a fully integrated antifouling concept and the possibility for automatic and remote-controlled operation.
- -4H- Jena engineering has already more than 10 years experiences on Ferrybox Systems

Thank you very much
for your attention