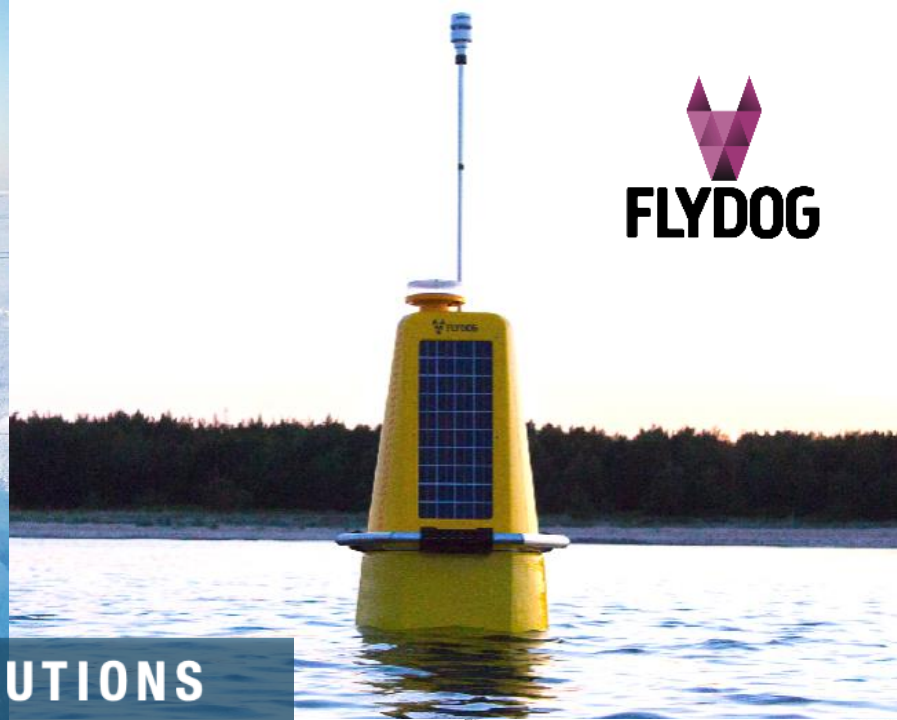


LOOK BENEATH THE SURFACE



FLYDOG

KARL VENE



ENVIRONMENTAL MONITORING SOLUTIONS

WWW.FLYDOGMARINE.COM



PROFILING BUOYS

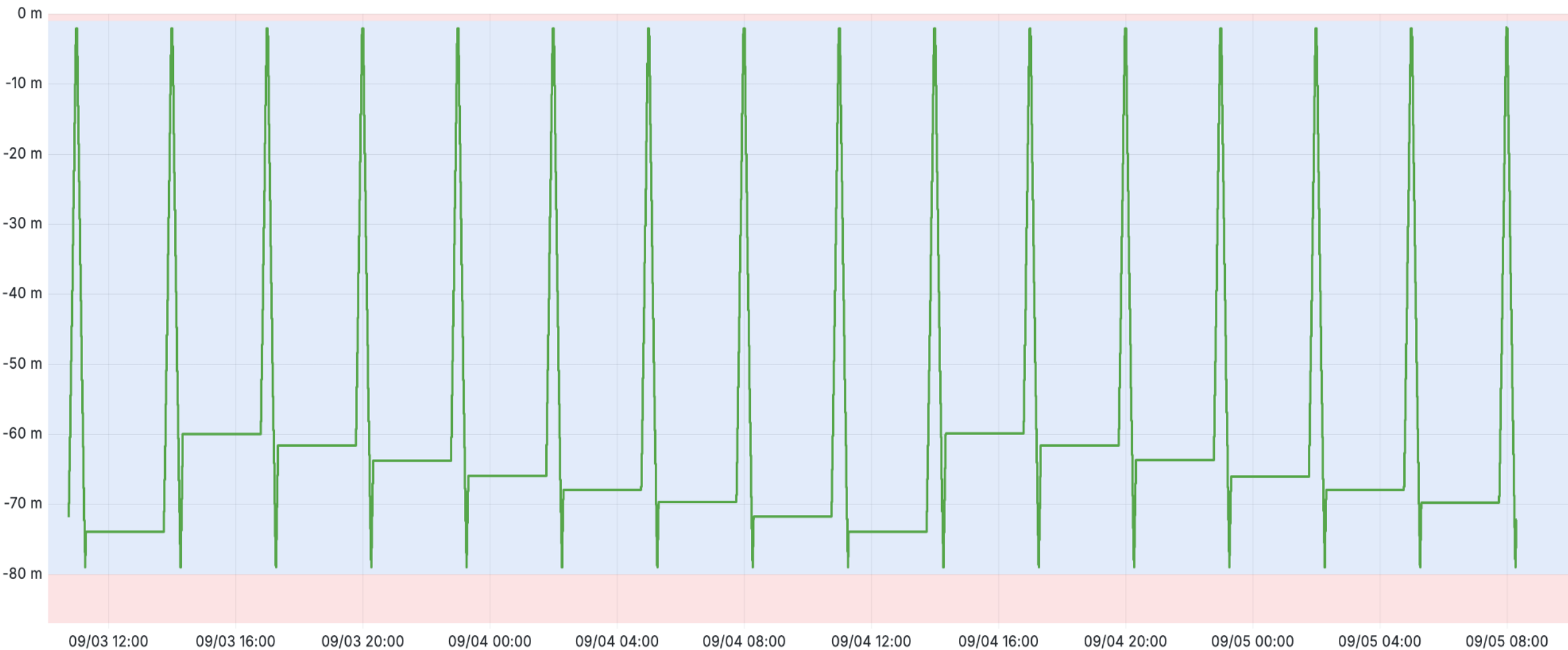


Lake Ägeri, Switzerland

Profile every 3h (ca 3000 profiles per year)
Sensors travel 500 km



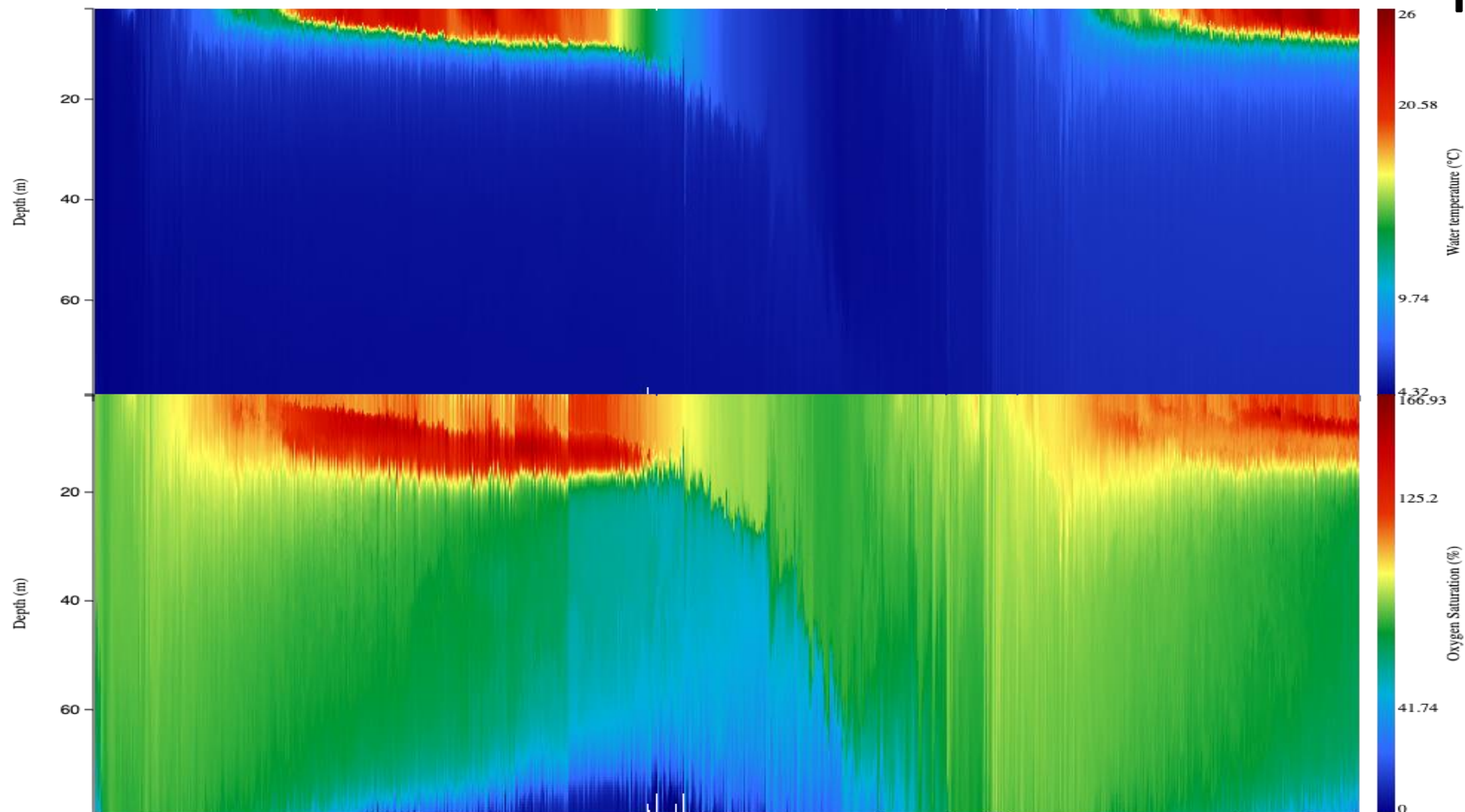
Sonde Depth (m)



Lake Ägeri, Switzerland. 2 years of profiling.



FLYDOG



FERRYBOX

MAIN FEATURES:

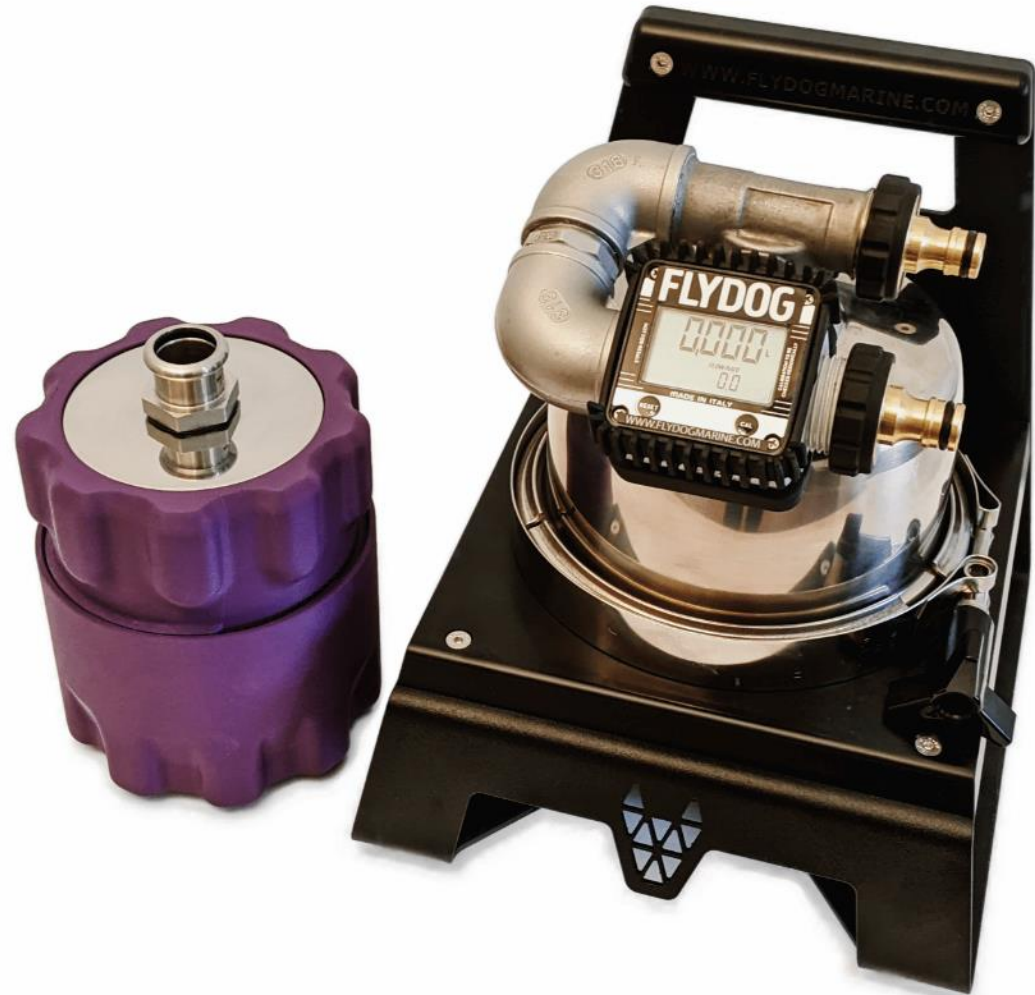
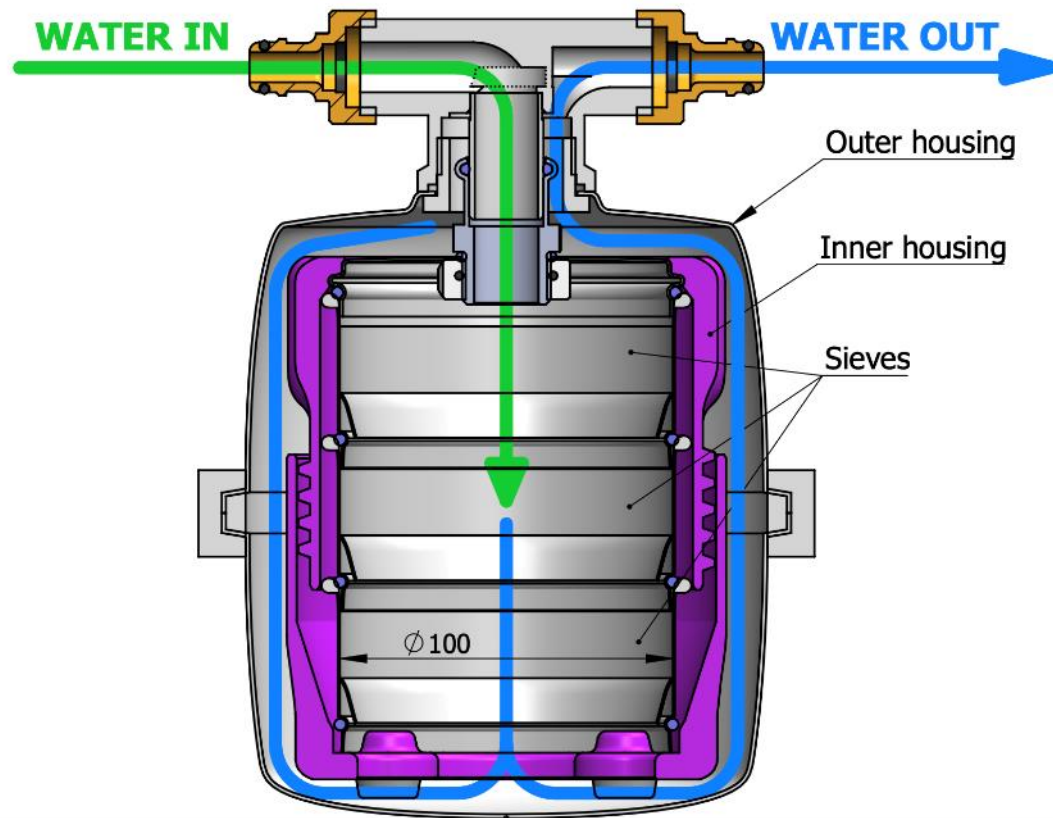
- PUMP
- FILTER
- DEBUBBLER
- OVER-PRESSURE VALVE
- FLOW-METERS
- WASHING CYCLE

ADDITIONAL FEATURES:

- 3X MICROPLASTICS SIEVES
- WATER SAMPLER
- EXTERNAL SENSORS (PH)



MOBILE MICROPLASTIC SAMPLER



DATALOGGER FAMILY

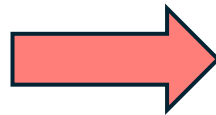


MAIN FEATURES:

- ARM Processor, runs Linux
 - Full remote control
- Web-browser based UI
- Low power consumption



Power consumption
0,6 W



Power consumption
0,013 W
0,000 0136 W (deep sleep)

THE PRODUCT



Enable OTA mode

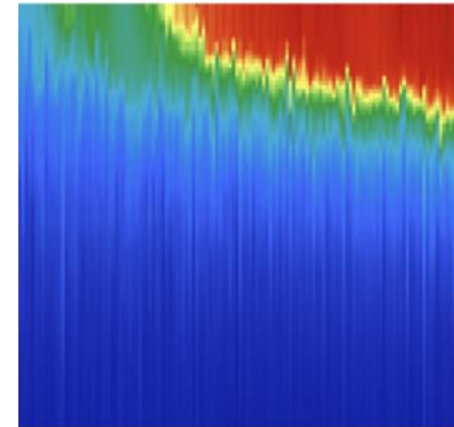
Command

Starting Depth (m)

Target Depth (m)

Standby Depth (m)

Speed (cm/s)



Mechanics



Electronics

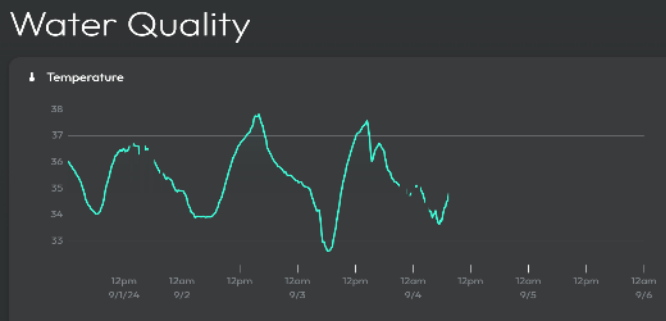
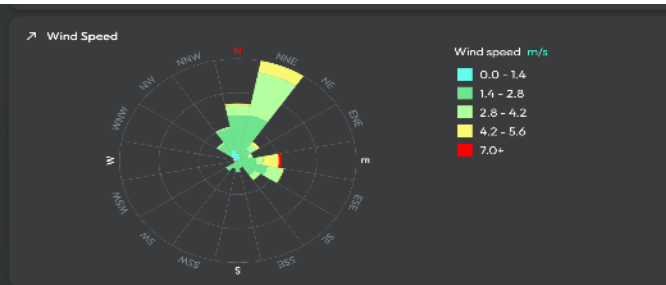
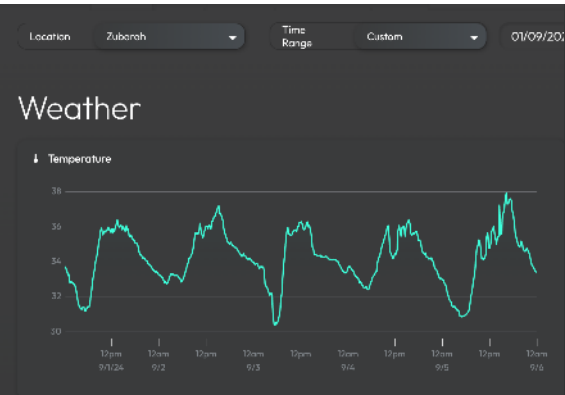
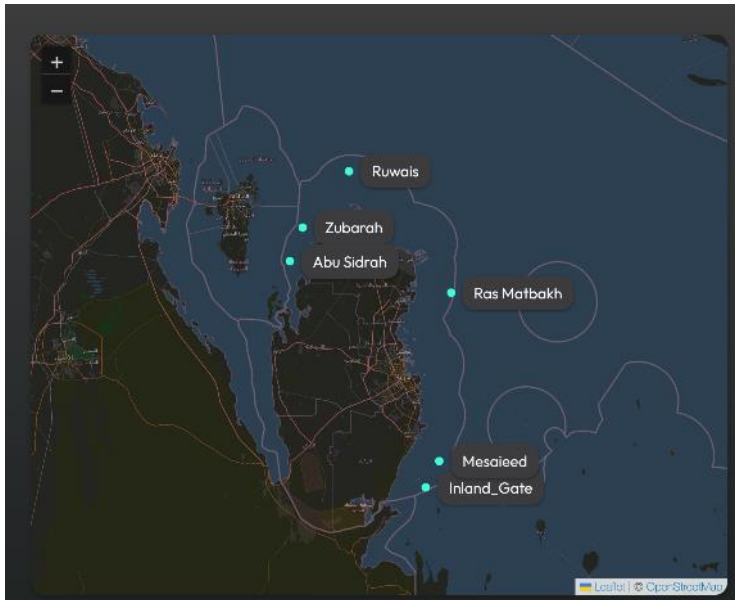


Software



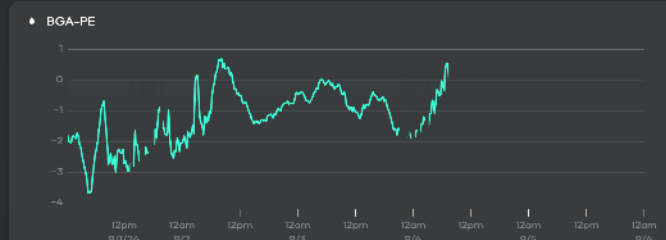
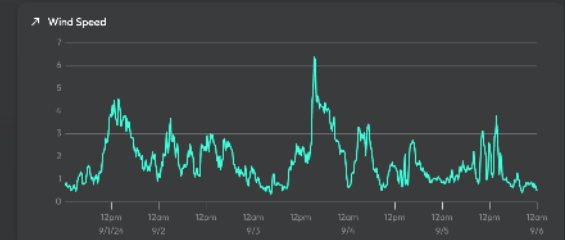
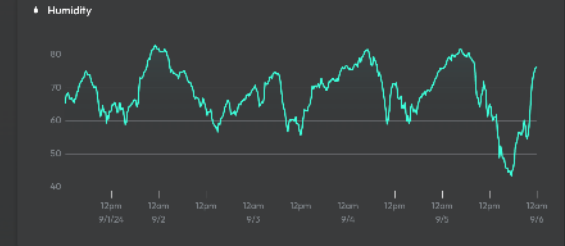
Data

QATAR. CONTROLLERS AND CONTROL ROOM DASHBOARD



Name	Min	Max
Humidity %	0	100
Pressure hPa	0	100
Radiation W/m²	0	0
Temperature °C	0	3
Wind Angle °	0	100
Wind Speed m/s	0	100

Name	Min	Max
CDOM ppb	1	100
Depth m	1	100
Dissolved Oxygen %	1	100
ORP mV	1	100
Crude Oil ppb	1	100
Refined Oil ppb	1	100
Conductivity mS/cm	1	100
TDS mg/L	1	100
Temperature °C	1	100
Turbidity FNU	1	100
BGA-PE µg/L	1	100
pH units	1	100



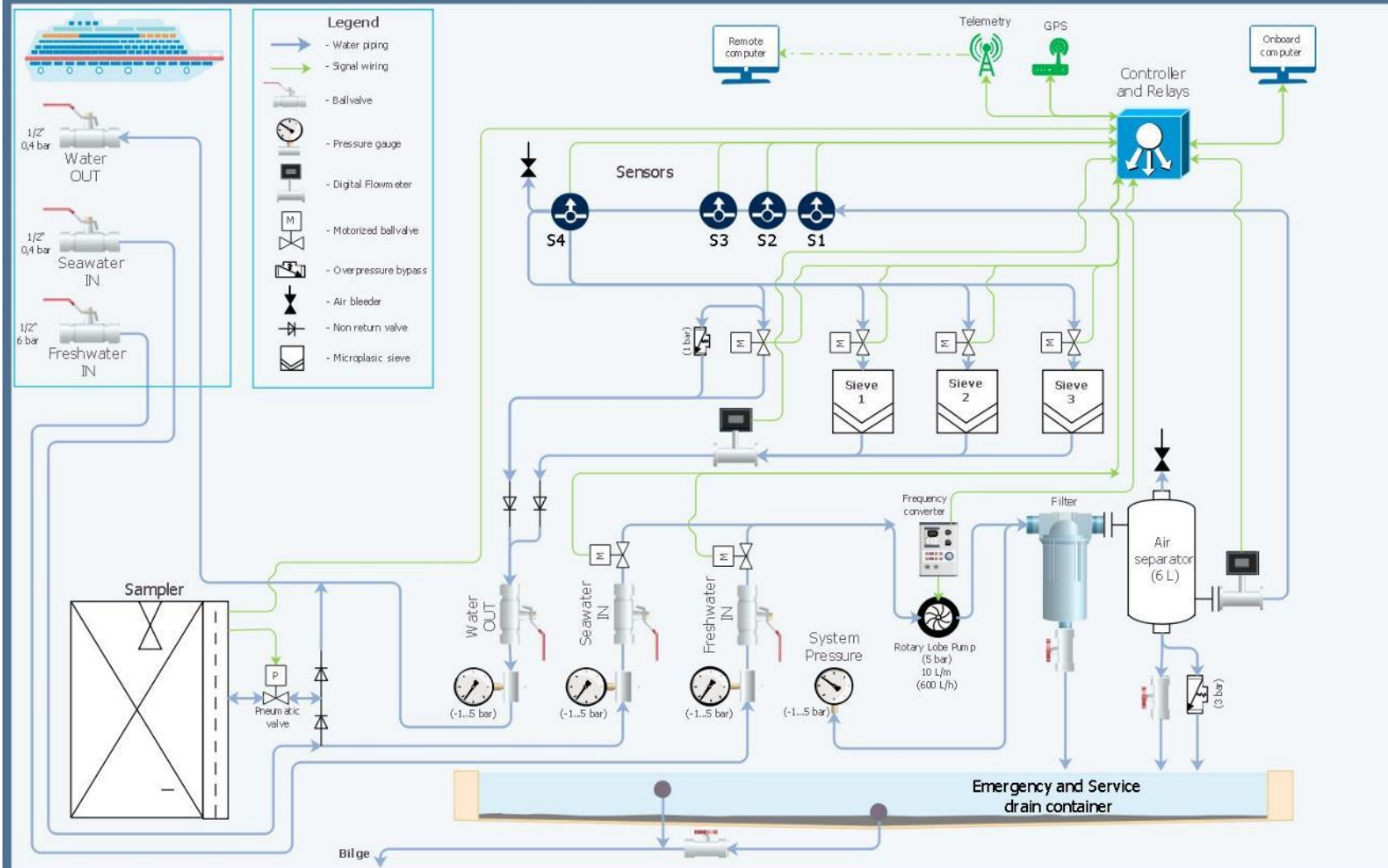
Reliability



DESIGNING A FERRYBOX



Flydog Ferrybox Process Flow Chart



FERRYBOX INSTALLATION



LESSONS LEARNED:

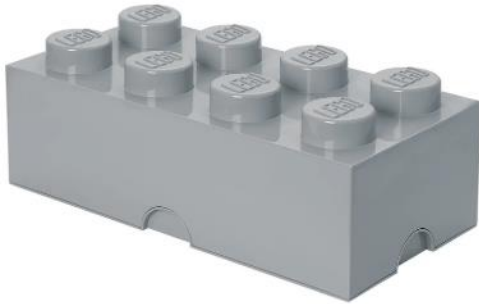
- PLANNING HELPS, BUT CREATIVE PROBLEM SOLVING IS A MUST
- ANYTHING CAN BE NEGOTIATED EXCEPT PHYSICS
... AND
SHIPS CHIEF ENGINEER



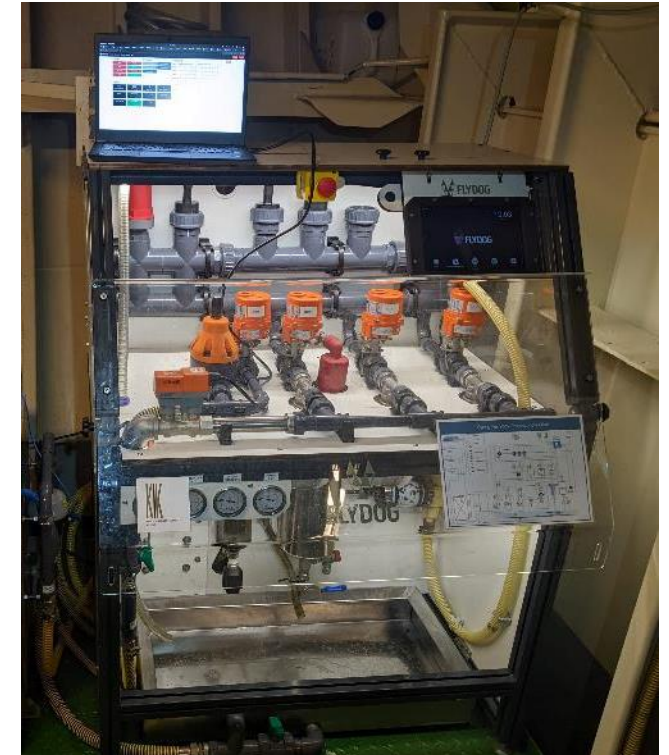
PLC vs Linux



FLYDOG




- **CONTROL OF ALL FUNCTIONALITY**
 - SENSORS
 - TELEMETRY
 - PUMP, VALVES
 - META DATA ANALYSIS
 - INTEGRATION WITH OTHER SYSTEMS
- **EVOLVING FUNCTIONALITY**
 - ADDING/CHANGING SENSORS
 - TRIGGERING EVENTS
 - REAL TIME CALCULATION
 - PRE PROCESSING DATA
 - ETC



FERRYBOX

- WEB-BROWSER BASED USER INTERFACE ENABLES USERS TO CONTROL THE SYSTEM IN REAL TIME
- FULL CONTROL ENABLES US TO ADD FUNCTIONALITY IF NEEDED



 FD190719 Setup Advanced Manual Control Map Logout Reboot

Relays

Sieve1

Sieve2

Sieve3

Sea Water

Pump

Sieve2

Drain

Fresh Water

Sensors

Program

Start Manual Mode

Start Auto Mode

Abort Wash

System Wash

Sieve Wash

Sampling

sample 1

sample 2

sample 3

sample 4

sample 5

sample 6

sample 7

sample 8

sample 9

sample 10

sample 11

sample 12

Status

0.1
Drain Flow (l/m)

0.07
FSI salinity

29.47
FSI temperature (C)

0
Pump RPM

0
Pump Current (A)

Harbor

Measuring

System Wash

Sieve Wash

Pump Starting

Manual Mode

Sampling

sample

+ Polygon

+ Rectangle

1: Rectangle

Delete

2: Rectangle

Delete

3: Rectangle

Delete

4: Rectangle

Delete

5: Rectangle

Delete

6: Rectangle

Delete

7: Rectangle

Delete

8: Rectangle

Delete

9: Rectangle

Delete

10: Rectangle

Delete

11: Rectangle

Delete

12: Rectangle

Delete

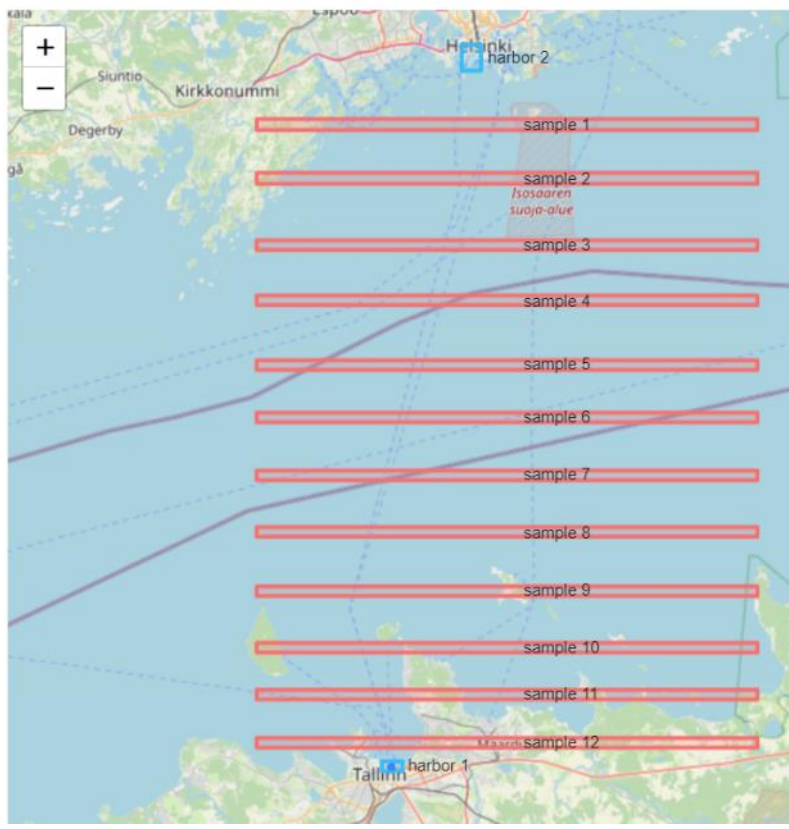
sieve

+ Polygon

+ Rectangle

1: Rectangle

Delete



Reliability



Preventive Planned Maintenance

- **MEASURING SYSTEM CRITICAL PARAMATERS**
 - NOISE, VIBRATION...
 - SENSOR CURRENTS
 - TIME OF USE
 - BIOFOULING INDICATIONS
 - ACCELERATION
 - ...
- **COLLECTING SYSTEM DATA**
- **ANALYSING SYSTEM DATA**
- **RECOMMENDING PREVENTIVE MAINTENANCE ACTION**



**IF ENVIRONMENTAL
DATA IS VALUABALE,
THE SYSTEM IS AS
VALUABLE**

THE FUTURE WE WORK TOWARDS



FLYDOG

IMAGINE YOU HAVE **100** SYSTEMS

WHAT NEEDS TO GO DOWN:

- PRICE PER DATAPOINT
- TIME FOR MAINTENANCE
- TRAINING FOR MAINTANCE
- INSTALLATION COSTS
- POST PROCESSING DATA

WHAT NEEDS TO GO UP:

- RELIABILITY OF SYSTEMS
- NUMBER OF AUTOMATED STATIONS
- MORE SMARTER SENSORS
- SMARTER FLEET MANAGEMENT
- PLATFORM SHARING

THANK YOU !

KARL VENE

02.10.2024

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