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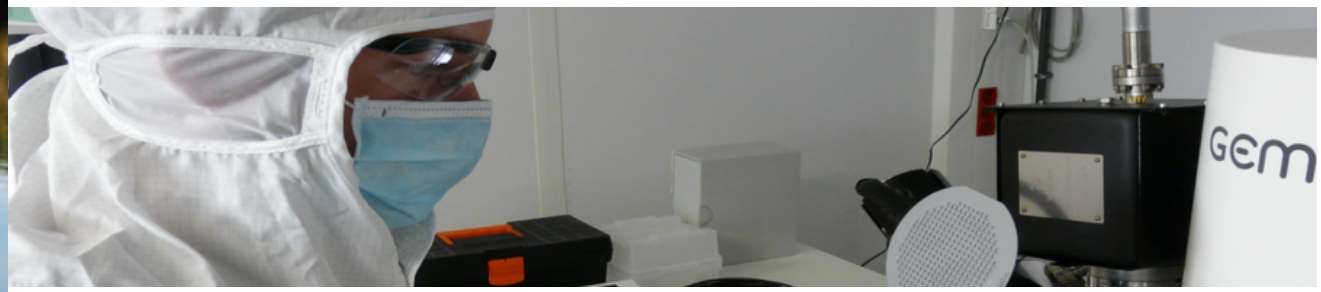
OSPR-Chevron Workshop March 01, 2017

Overview of fluidion sampling and analysis technology
Applications to spill response and monitoring



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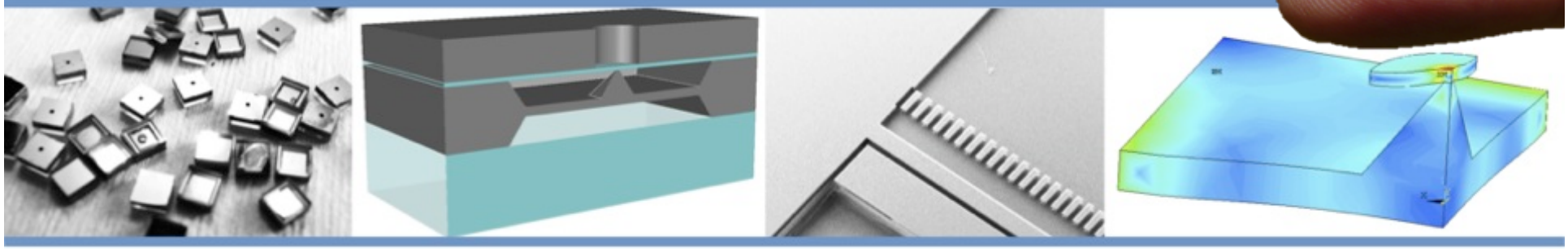
fluidion technology highlights

- Proprietary technology, integrated fluidic components
- Products for
  - *Spill First Response and Environmental Monitoring*
  - *Water Quality (drinking, wastewater, recreational)*
  - *Oceanography*
- Remote connectivity
- Complete sample manipulation protocols
- Multispectral optical measurements
- Multiple international patents



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Products and markets

Sampling and Analysis

RS-14V Sampler
Chemical analyzer

Microbiology

In-situ E. Coli ALERT System

Subsea

Sampling at depth (AUV/glider)

Oceanography

Ocean acidification (pH)

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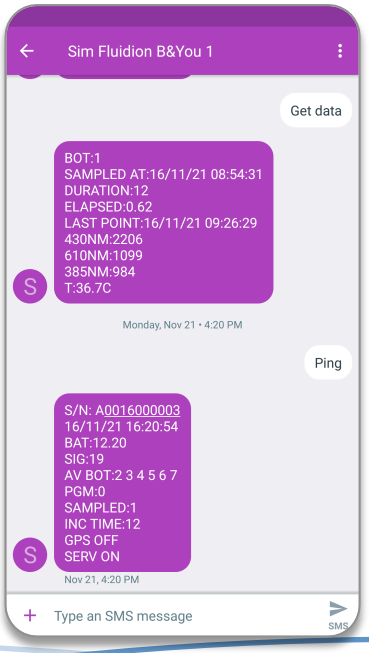
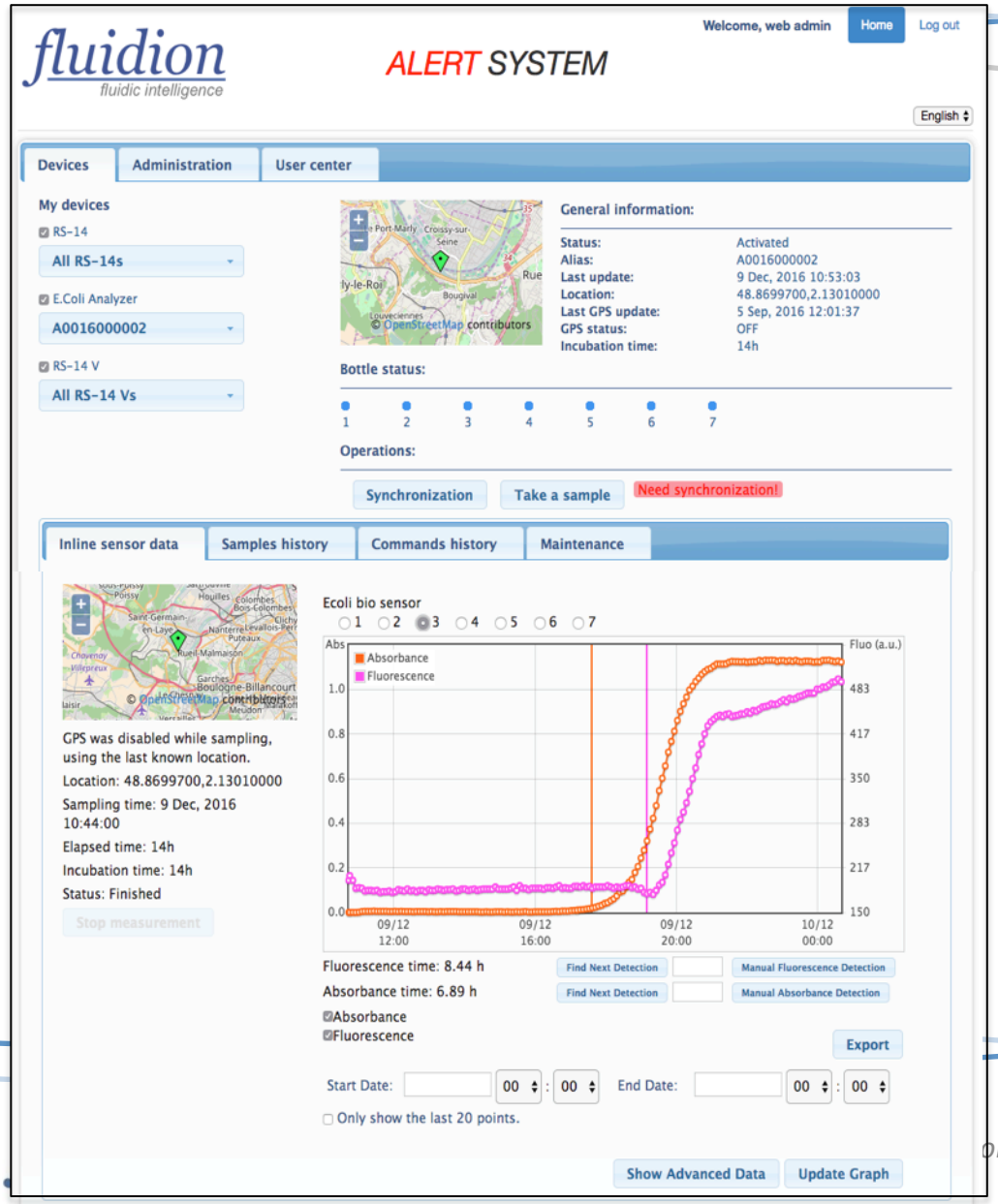
Connected real-time field products

Smart control interfaces (cell, web)

- Secure web interface
- Cell phone SMS interface
- PC/Mac software (USB)





RS-14 Rapid Sampler

- *Fully autonomous sampling workhorse*
- *On-demand remote or sensor trigger*
- *Versatile: use near shore or in open waters on buoy or boat, surface or submersed*
- *No sample cross-contamination*

For the most demanding applications:

- ✓ *spill response monitoring*
- ✓ *impact studies*
- ✓ *sample time series*
- ✓ *storm sampling*

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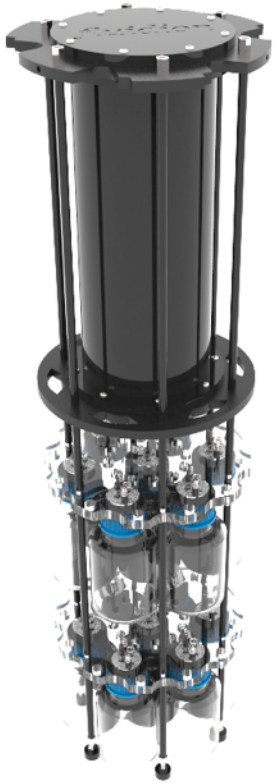
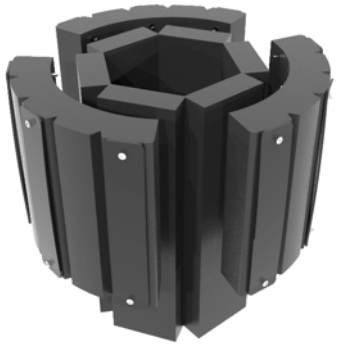
RS-14 configurations

Sampler body



Protection housing

Optional
Buoyancy floats



Wireless communication
GSM / Radio / LoRa

Water sampler configuration

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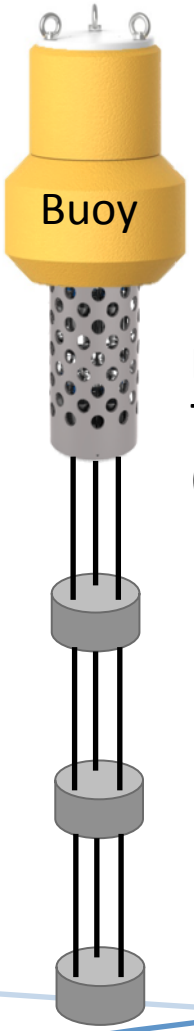
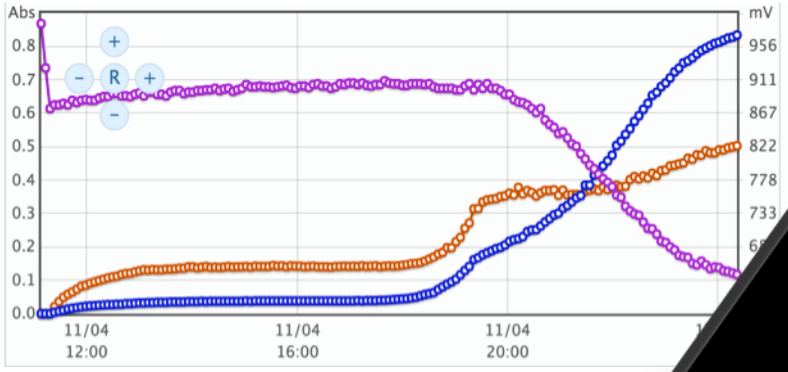
RS-14 configurations



Communication and control module, battery

RS-14V sampler
Trigger sensors
(pH, fluorometer)

Depth sampling stations



- *Real-time data communication*
- *Activation of sampling on-demand*
- *GSM or LoRa networks*

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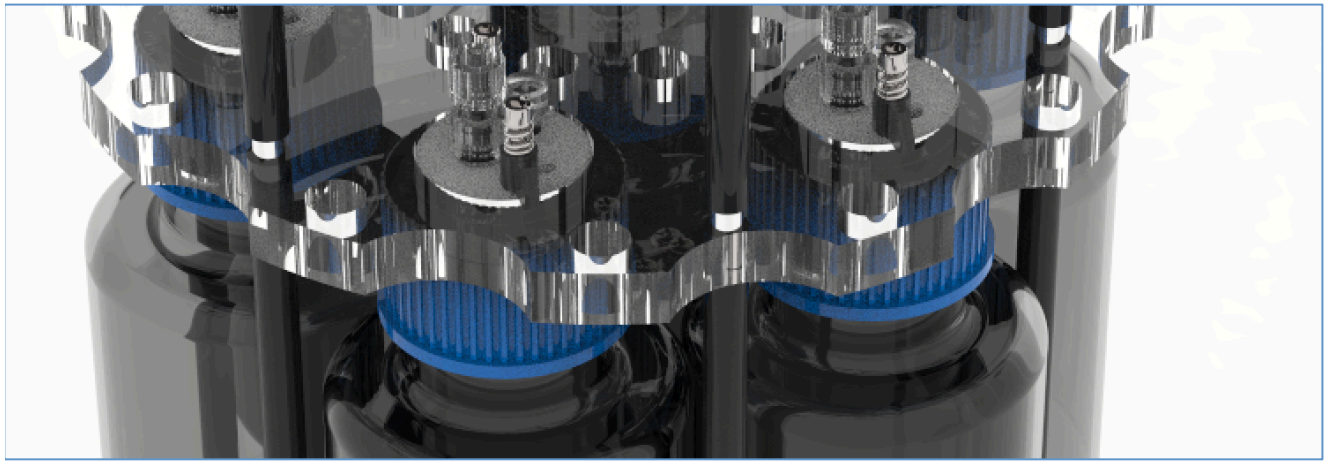
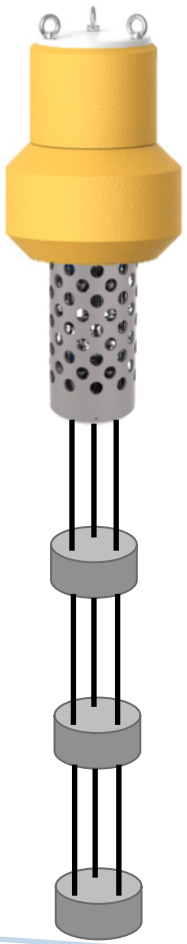
RS-14 specifications



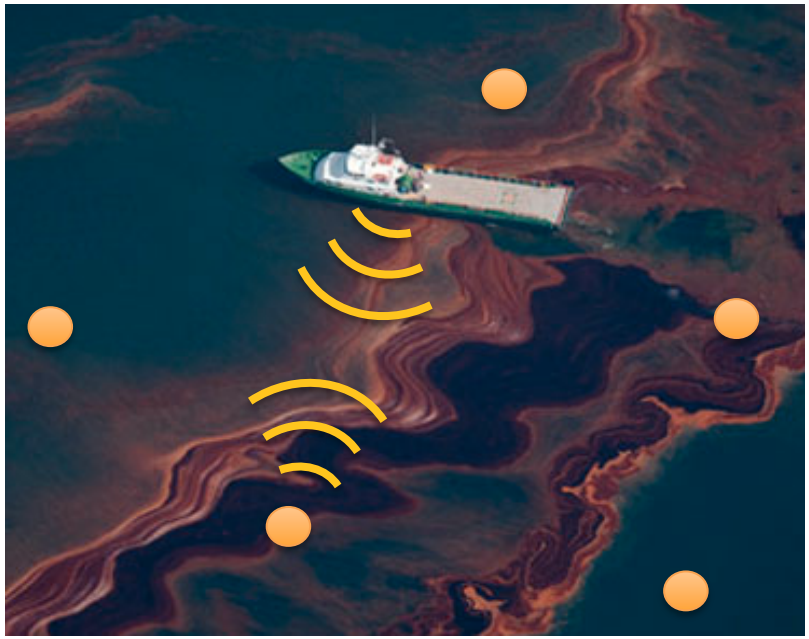
TECHNICAL SPECIFICATIONS

Dimensions	*L : 90 cm, D : 25 cm*	**Number of samples**	*14*
Weight	*15 kg*	**Sample volume**	*250 mL*
Sample trigger	*On-demand, pre-program, inline sensor*	**Bottle materials**	*Glass, plastic (optional)*
Inline sensor	*Optional, different sensors available*	**Communication**	*GSM/GPRS, USB, radio (optional), secure web interface (optional)*
Body materials	*PMMA, PVC Acetal, SST 316L*	**Antenna**	*Internal (standard) External (optional)*
Battery type	*Li Ion*	**Autonomy**	*4 weeks to 2 yr. depending on operational mode*

RS-14 example applications



Special Monitoring of Applied Response Technologies (SMART)



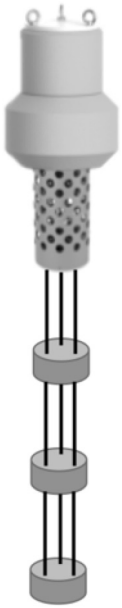
RS-14 obeys Tier III SMART recommendations:

- Water column monitoring
- Representative depth sampling
- Remote real-time activation
- Wireless data transmission
- Fast deployment in crisis
- Simultaneous sampling at multiple locations (mapping)
- Simple and inexpensive logistics
- Assist with decision-making
- Can implement sample treatment and analysis

RS-14 example applications

Comprehensive surface and at-depth monitoring of oil plumes

RS-14V Sampling Buoys



Control ship

AUV/Glider Sampling

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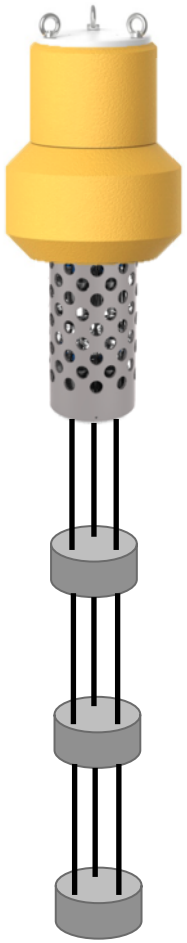
Fluidion technology



- *Real-time data collection – radio (LoRa) or GSM*
- *Sample acquisition – multiple locations and depths*
- *Simple installation logistics*
- *Wide range of applications*

Can be used wherever there is a monitoring need:

- ❖ *Spills – chemical and oil*
- ❖ *Biological contamination*
- ❖ *Fresh water or sea water*
- ❖ *Evaluate treatment efficiency*
- ❖ *Objective assessment*

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Thank you!

For additional information:

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