



ADAPTIVE MICROFLUIDIC - AND NANO - ENABLED SMART SYSTEMS FOR WATER QUALITY SENSING

Custom-Made IoT Solutions

Water monitoring

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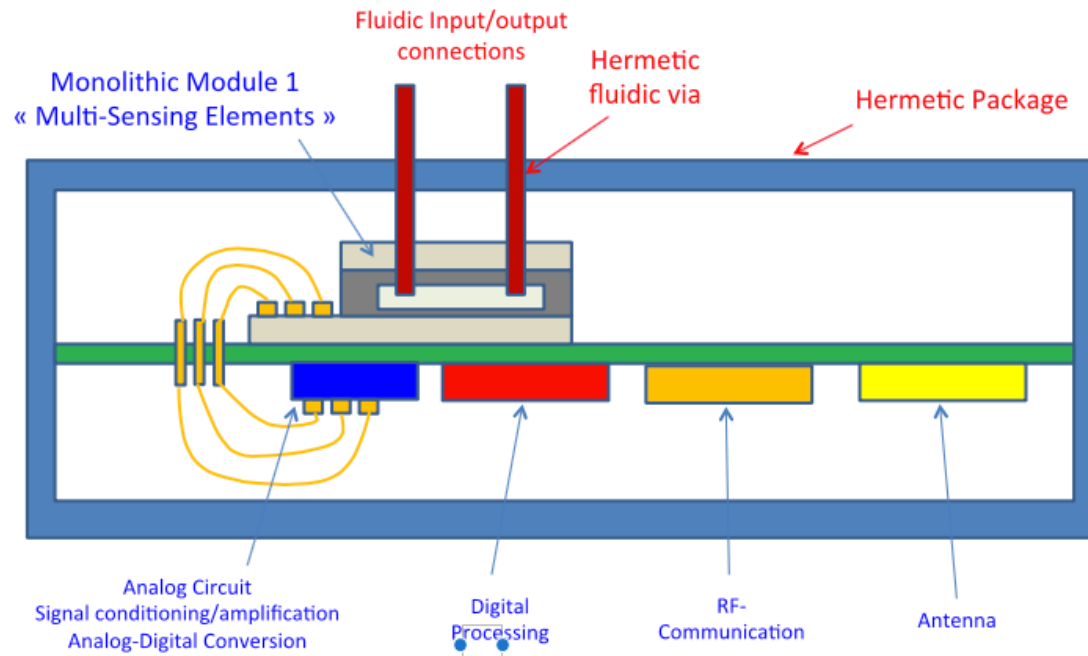
www.proteus-sensor.eu



Objectives

Measure Water Quality

- Provide the co-design of the smart system, building the system architecture with clear design of the heterogeneous building blocks (hardware and software) and of the interfaces between them (routing, bonding, packaging)



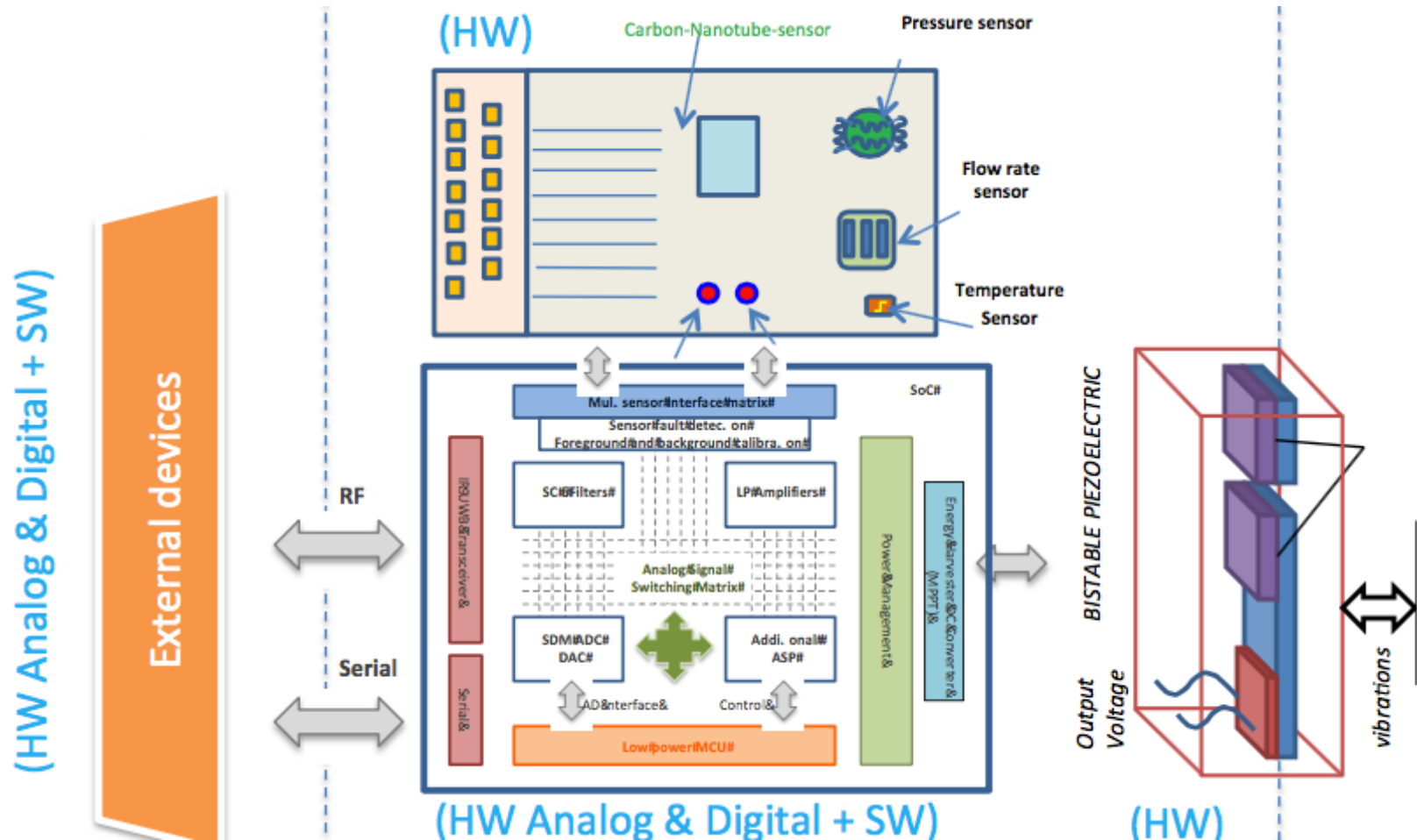
Target

Cheaper, Smaller, Reconfigurable

	Market State of the Art	PROTEUS product
Volume	1739 cm ³	~125 cm ³ : x10 decrease in volume
Measured parameters	7 parameters in predefined ranges	9 parameters with enhanced range of operation based on reconfigurability
Lifetime	>3 months	>2 year, x8 increase in lifetime
Communicating	Wired; handheld recorder	Fully wireless
Data Processing	No built-in data treatment	On-chip data processing for reaction, prediction and cognition
Autonomy	Wired power supply	Autonomous via energy harvesting
Selling price	2500€	Pre-series: <1000€; x2.5 decrease Industrial level: <100€; x25 decrease

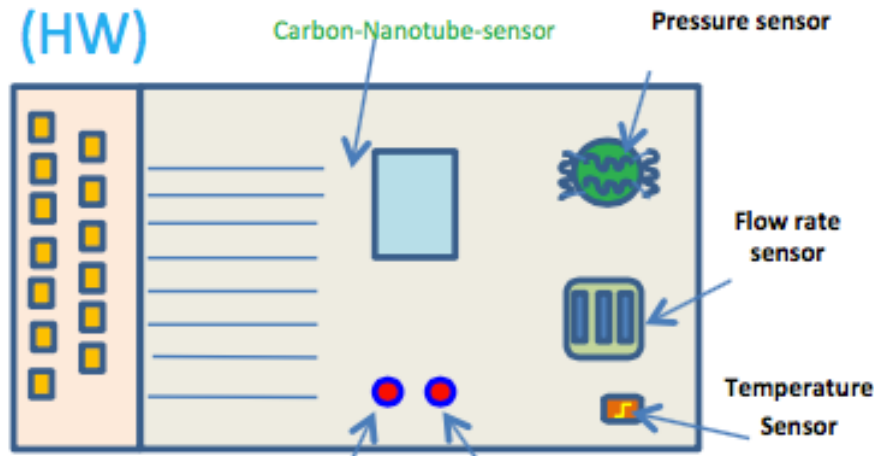
System Overview

Architecture



System Overview

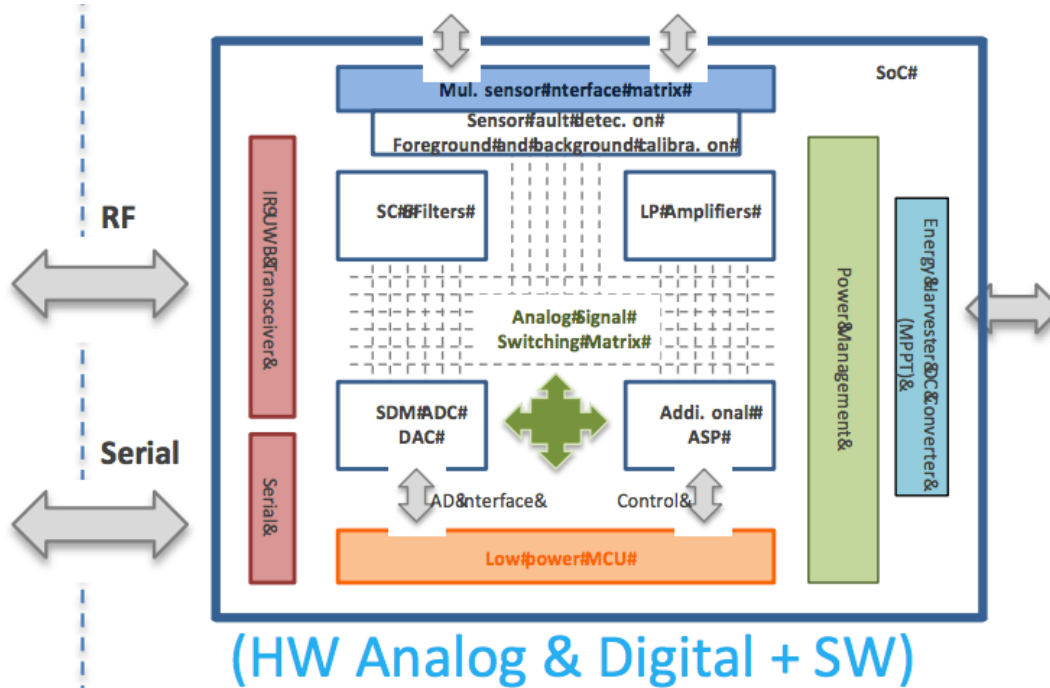
Sensing Capabilities



- All sensors (sensing elements) will be on the same silicon chip
- All sensors are based on a change of electrical impedance (resistance)
- Platinum is used as the material for metal electrode

System Overview

Process and Control



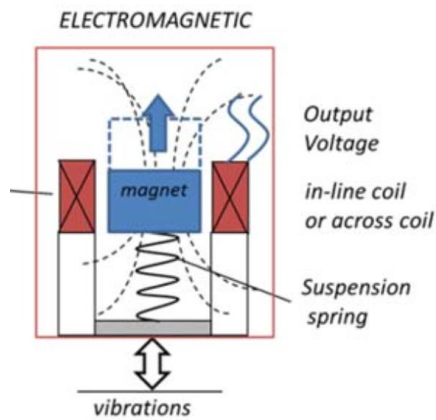
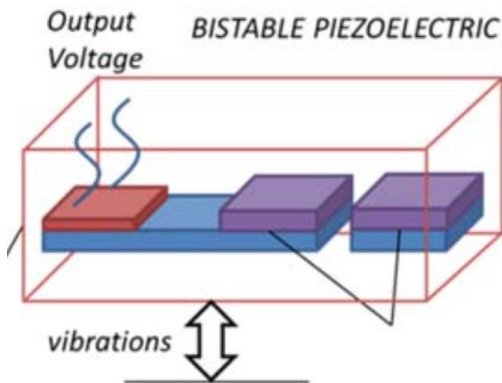
Energy efficient and autonomous reconfigurable SoC in deep submicron CMOS technology comprising:

- signal conditioning,
- sensor calibration,
- IR-UWB communication,
- programmable analog front-end and
- low power hybrid (analog-digital) processing

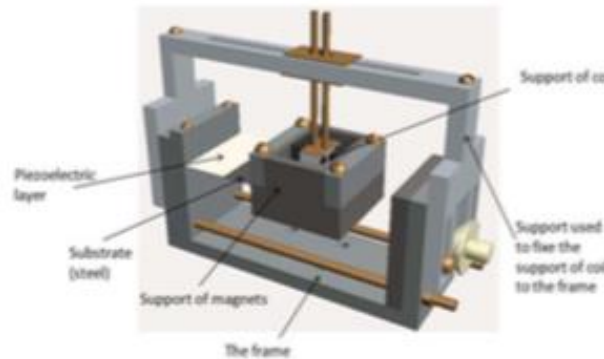
System Overview

Energy Harvesting

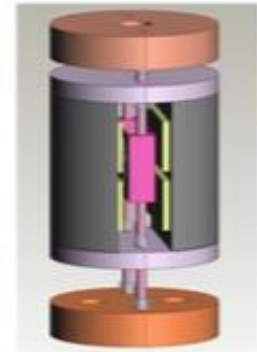
There are several options under study:



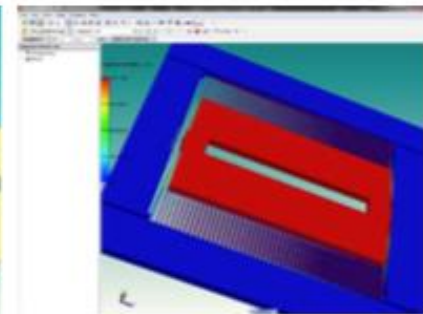
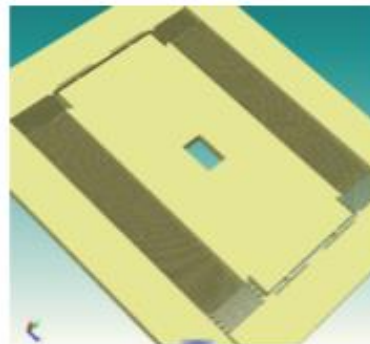
Hybrid piezo-EM VEH



Micro EM VEH



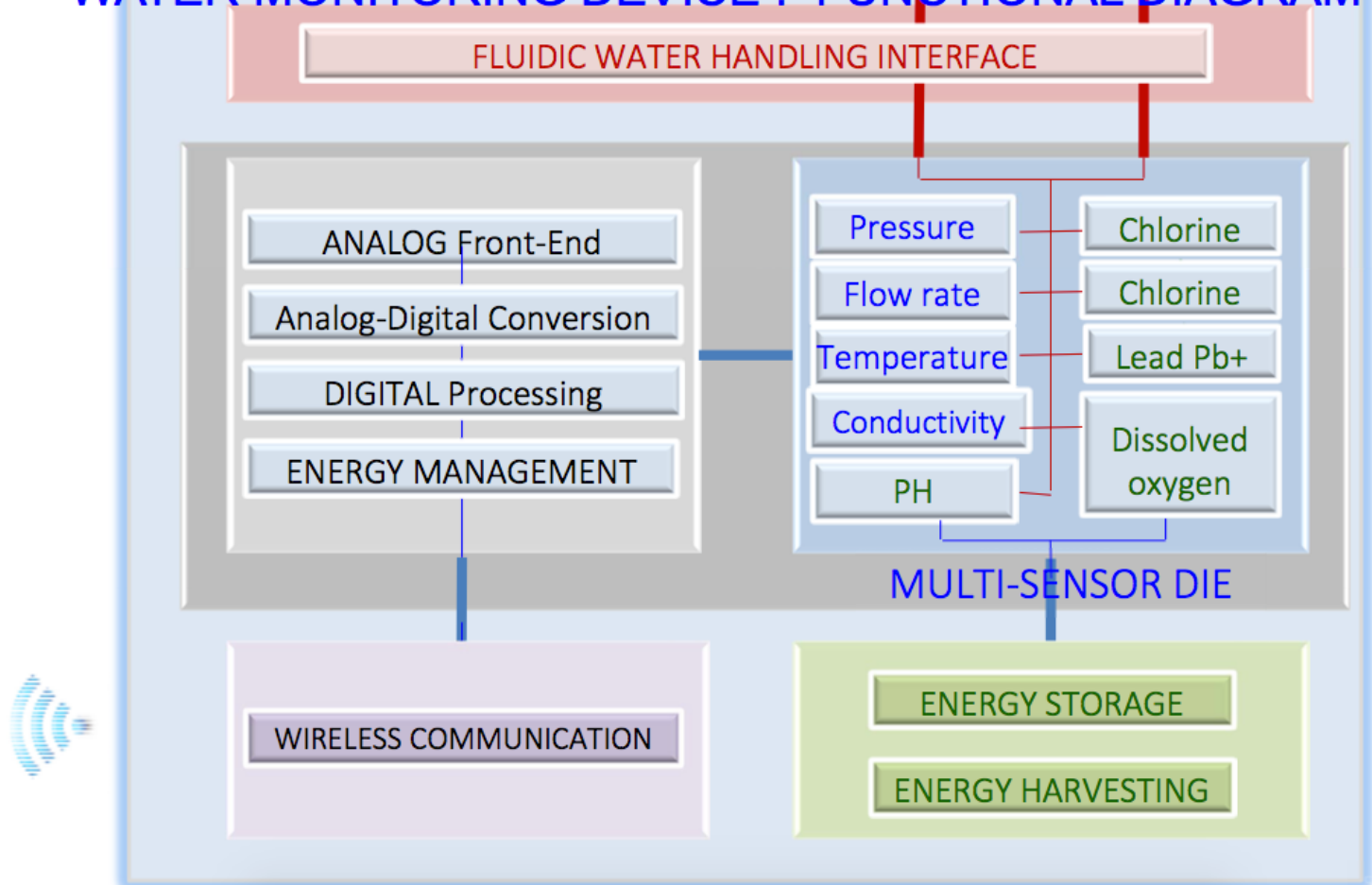
Electrostatic VEH (ESIEE/UNIPG)



System Overview

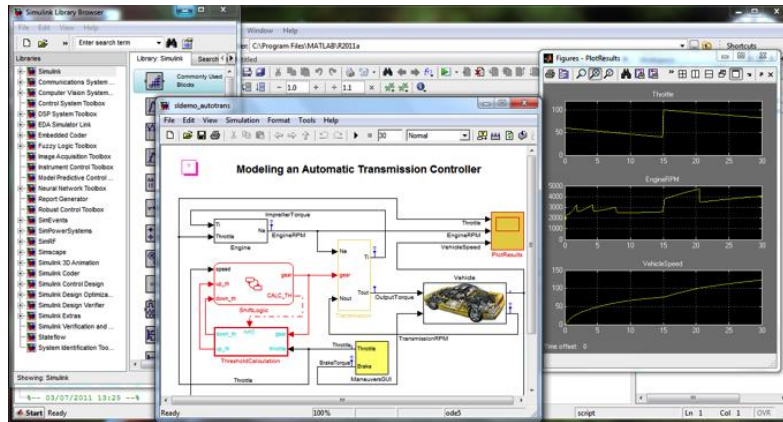
Functional Diagram

WATER MONITORING DEVICE : FUNCTIONAL DIAGRAM



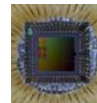
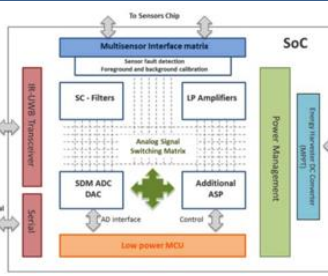
Final Message

Exploitation (Research to Market)

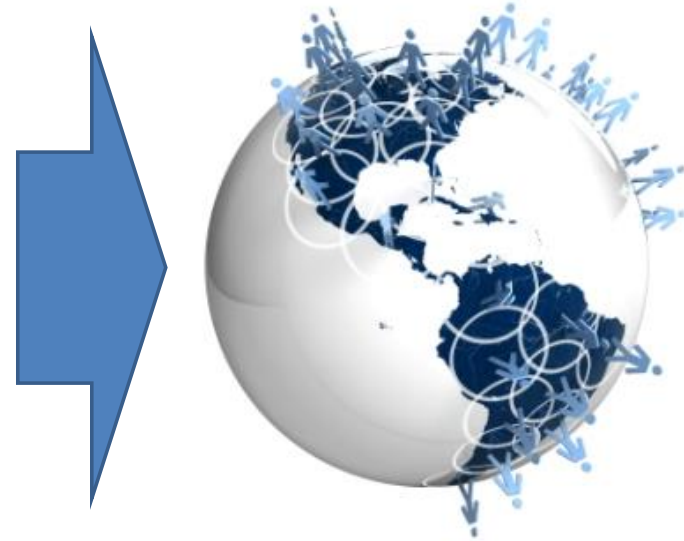


UNPARALLELED
INNOVATION

IDE – Modelling and
Simulation Tool



UNINOVA



Bring together with UNINOVA
the Analogue Front-end
solution to the market

Thank you !



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