# Batteryless iloT

## Smart factories & production processes digitalization

WEBINAR

SMART Industry Solutions in **Catalonia** and **Slovakia** 

JUNE 14, 2021





de Catalunya

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## Fundamental principle $\rightarrow$ Heat conversion to clean energy Space inspired



## INDU-EYE solution $\rightarrow$ The batteryless long-range iloT solution



#### Main advantages:

- Multi-sensor: vibration & temperature & 4/20mA sensors
- Communication: very long-range wireless NB-IOT (5G) / LoRaWAN
- No battery: no maintenance & minimal environmental impact
- Edge computing & A AEInnova DAEVIS<sup>™</sup> IoT Dashboard
- CE Mark / FCC ongoing / ATEX-IECEX ongoing





Use case for vibration Power generation sector



#### **Vibration and temperature on biogas plant** Main features:

- Low infrastructure: INDU-EYE  $\rightarrow$  LoRaWAN Gateway  $\rightarrow$  DAEVIS
- Long range coverage: 400m
- Parameters: 3 AXIS vibration
- Heat source: 60°C 120°C

Use case for vibration Chemical sector



#### Vibration measurements on combustion fans Main features:

- o Low infrastructure: INDU-EYE → NB-IOT→ DAEVIS
- Long range coverage: Up to 22Km without wireless infrastructure
- Parameters: 3 AXIS vibration
- Heat source: 70°C 140°C
- EDGE-Computing → FFT Spectrum analysis





Smart conditioning Oil & Gas



## Gas compressor vibration monitoring

- Low infrastructure: INDU-EYE  $\rightarrow$  LoRaWAN Gateway  $\rightarrow$  DAEVIS
- Long range coverage: 900m
- Parameters: 3 AXIS vibrations
- Heat source: 60°C



Vibration & Temp tire sector



## Fail detection on reactors and raspers

Low infrastructure: INDU-EYE  $\rightarrow$  LoRaWAN Gateway  $\rightarrow$  DAEVIS

- Long range coverage: 2Km
- Parameters:
  - o Temperature
  - 3-Axis vibrations
  - Heat source: 90°-120C



Use case for vibration monitor in railways, highways & mining



## Vibration monitor in ventilation fans for tunnels to avoid accidents & bad quality air

Savings:

80% compared to wired solutions

#### Main features:

- Low infrastructure: INDU-EYE → LoRaWAN Gateway → DAEVIS
- Long range coverage: 750m in this project
- Parameters:
  - Monitor: 3-axis vibration
  - Precision: 0.01g
  - Max vibration: ±4g
- Wind source from 10Km/h
- Ready in Q3-2021.





Use case for silos Cement / Sand / Grain - cereals

## CEMENTOS MOLINS

## Volume measurement for route planning

#### Main features:

CLOUD

- Low infrastructure: INDU-EYE  $\rightarrow$  NB-IOT  $\rightarrow$  DAEVIS
- Long range coverage: > 20Km
- Parameters:
  - Monitor: Distance / Lidar
- Fully powered by sun.
- Ready in Q4-2021.



### Cloud-based predictive maintenance IoT platform DAEVIS – Dynamic Aeinnova Visualizer



#### Main features:

- The perfect SaaS companion for INDU-EYE devices
- O Powerful dynamic graph engine and fully customizable
- Hierarchy management
- Alarms via pop-up, SMS, Email...
- Environmental impact report
- Predictive maintenance (Q2-2021)
- Integration with Scada or other platforms



Main economic savings > 60%

Savings in purchase:

- o 60% compared to **wireless solutions** (Emerson Rosemount, Yokogawa Sushi, SmartWatch Bitherm).
- 70-90% compared to **wired solutions** (GE Bently Nevada).

#### Savings in wireless infrastructure:

- LoRaWAN > 80% compared to **wireless solutions** using WirelessHart or ISA100.
- NB-IOT / LTE-M >95% compared to other wireless and wired solutions.

## Savings in device maintenance:

> 150€ / yearly in battery replacement.







Main environmental Impact savings > 98%

### 10,000 Wireless competitor's sensors Battery-powered



# 10,000 Wireless Indu-Eye's sensors fully heat/wind powered





#### Who we are? A 7 years old EU Scale-up

#### 21 High qualified team

3 Ph.D.15 engineers.3 Finance, business & admin.

#### 5 European Union R&D Public Grants ongoing

- H2020 EIC Pilot. Project INDUEYE 2.0. IOT & Harvesting.
- H2020-FETPROACT-2018-2021 RIA. Project HARVESTORE.
- LIFE Programme. Project HEAT-R. Waste heat recovery.
- AEI- Spanish Ministry of Industry: Batteryless vibro Sensor.
- ACCIO. Nuclis d'economia circular. INDU-EYE



#### 28 international Awards

- IoT Innovation World Cup 2021. Top 4 in industrial IoT.
- EU Innovation RADAR 2020. Top Innovator in autonomous sensors.
- •G-STIC 2019. Global sustainable technology & innovation.
- United Nations Go!ODS 2018 Global compact ODS7.
- IOT World Congress 2017. Best global technology.
- DENA 2017. Energy Transition AWARDS.
- United Nations 2016. Ideas4Change.
- REPSOL Foundation 2014-2017. Entrepreneur fund...
- •EIT Innoenergy Highway: 2014 -2016.

## Thanks for your attention

Dr. Raul Aragones – Business Developer





