



**Enabling Use of unmanned vehicles to improve Port of the Future operation**

EURO MED TELCO FORUM 2016, Valencia

# ABOUT US

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**Televes** corporation

Total commitment to quality

Televes brand is the head of a group of technology companies with the common goal of generate value in the sector of Telecommunications and Information Technology.

Formed by 21 companies, the Televes Corporation uses the high specialization technology to create synergies

**group in the design, development, manufacture and marketing of products**

and solutions for the communication infrastructure of buildings and homes.

**PASSION** for QUALITY

# TELEVES CORPORATION 2015 (M€)



## The power of Synergies

Televés Corporation focuses on the **synergies** of its **technological and industrial group** to **develop telecommunications infrastructure** of buildings and homes to provide present and future services to their users, services ranging from leisure and entertainment to health and wellness.



Televés is present in almost **100 countries**, either directly or through its **10 subsidiaries**



# PROPOSED IDEA

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Use of intelligent autonomous platforms for Smart port and coast management related with:

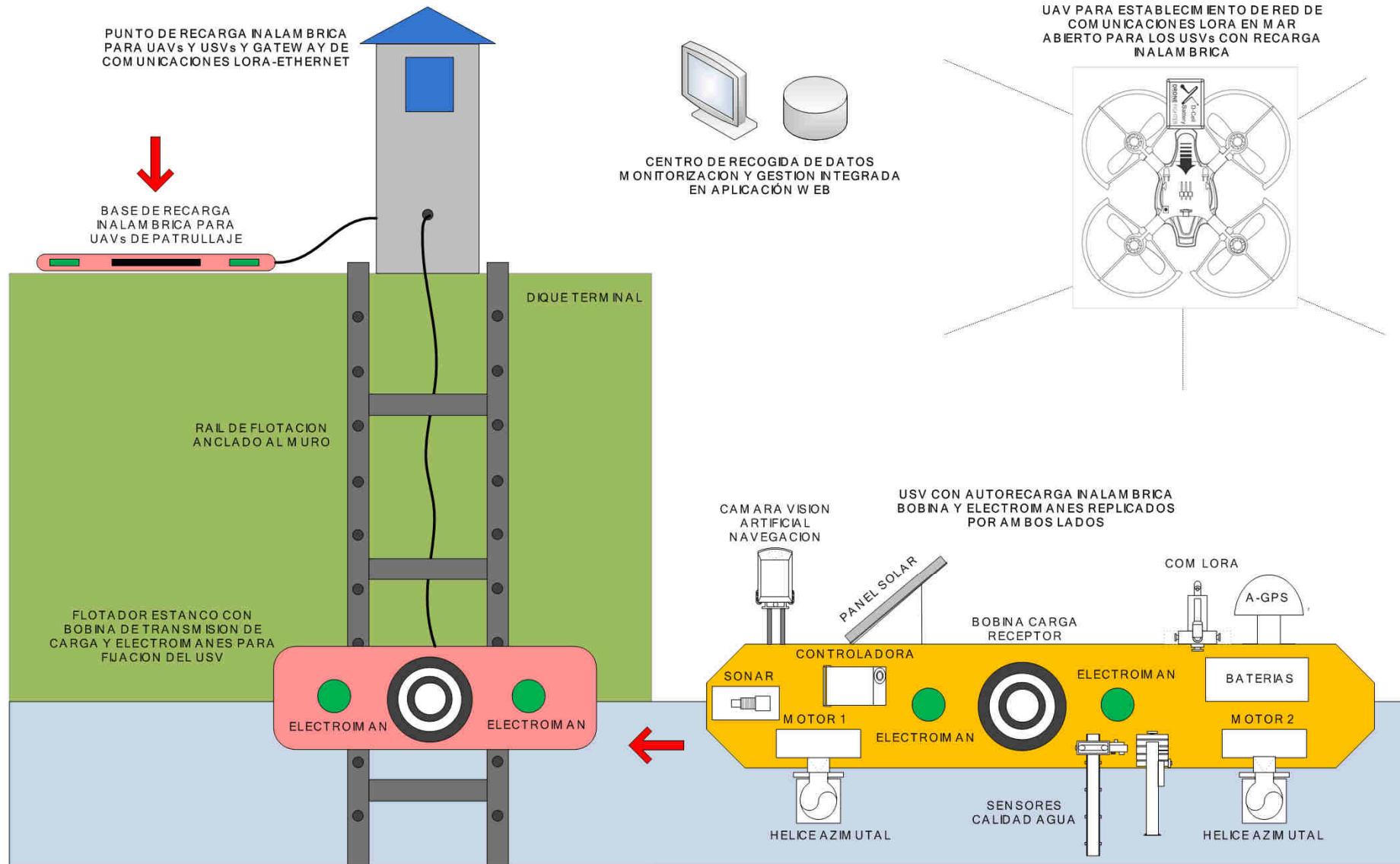
- Bathymetry
- Surveillance
- Environmental control
- Water quality

# SYSTEM DESCRIPTION

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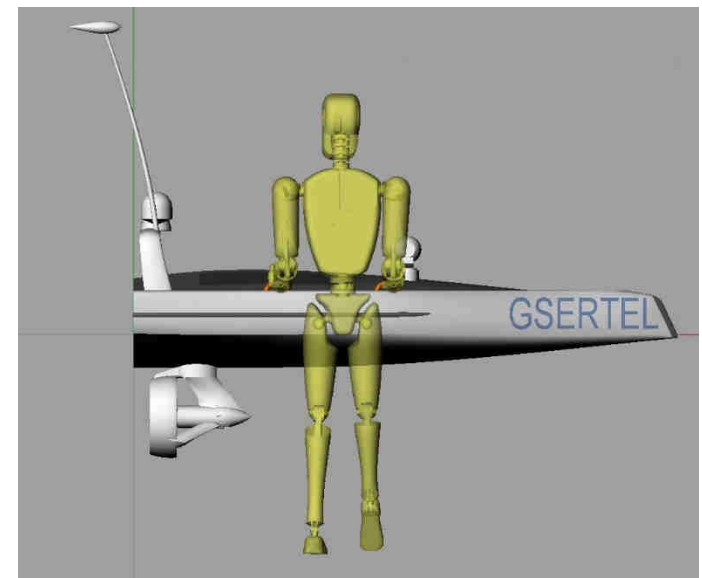
- Fleet of collaborative unmanned surface vehicles (USVs), electric propulsion
- Different payloads: surveillance cameras, bathymetry SONAR, water quality sensors ...
- Command and control platform, including:
  - Cooperative route/trajectory planning
  - Long range wireless communication
  - Operation time (unattended charge)
- AV Communication gateway
- Port gateway

# PROPOSED ARCHITECTURE



# USV

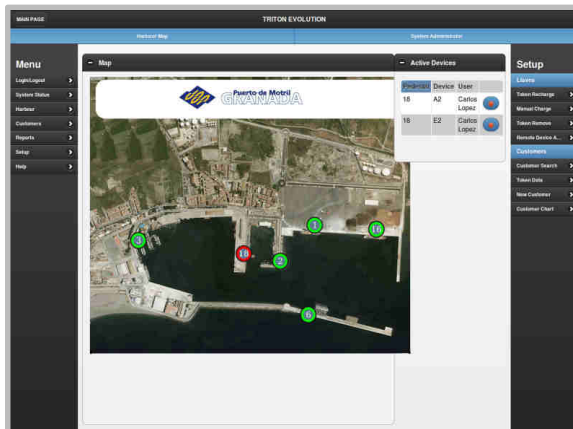
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- 2.000W Electric Propulsion. Torqeedo Cruise 2.0R motor, allowing 10 Kg payloads
- Monohull, 2x1 m
- Manufacturing is made in fiberglass / carbon, rolled on a core of closed-cell polystyrene
- Water lines will ship features planing hulls, with the aim of maximizing the Froude number and therefore the maximum operating speed. An inverted bow will be incorporated (wave-piercer)

# COMMAND AND CONTROL SYSTEM

- Intelligent control algorithms to enable collaborative USVs to complete in an autonomous way the operator defined mission. System will be based in:
  - Stereoscopic vision system with infrared vision cameras to create a 3D depth map and detection of objects in real time
  - Calculation associated with navigation between different points of interest to the initial cost mapping stage
  - Dynamic route according to the kinematic constraints vehicle planning, the initial map of the area and the presence of new obstacles
  - Connected with port services management system





# AUTONOMOUS BATHYMETRY

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The system will provide bathymetric measures periodically and autonomously, enabling:

- Make decisions about when and in what areas of the port dredging operations should be performed
- Set sedimentation process models with which to make decisions on the construction of civil works which reduce the impact of current and torrential rains

It will result in significant cost savings for the port operator and increased operational safety

# Evaluation of Water Quality and Detection of Hydrocarbons

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USVs collaborative vehicles will allow systematic sampling and water quality analysis providing real time information about:

- Water quality
- Presence of contaminants

Because it will be in real time, it will allow early detection of possible contamination sources

The parameters to assess the demonstrator will be some basic figures such as turbidity, temperature, pH, salinity and dissolved Oxygen and Hydrocarbons. [Microbiological parameters (total coliforms, E.coli and Enterococci), nutrients (nitrogen, phosphorus and carbon), heavy metals (Zn, Cd, Pb, Cu, Ni, Cr, Co, Fe and Hg) and organic compounds (PAHs, PCBs, pesticides, BTEX, DBT, MBT)]

# COAST SURVEILLANCE

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This autonomous fleet will be a complement to other automatic identification systems (like AIS) and will be integrated with other services like Salvage and Maritime Surveillance

Two working modes:

- Autonomous mode: The operator defines the points of the route where periodic images to be transmitted
- Manual mode: allows direct a vehicle within the range of the system to a position required by the operator, for example, in the vicinity of a ship. The information transmitted will be a panoramic image from the point in question



# Televes

European technology **Made in**  **EUrope**

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