

## Sustainability and Smart Energy



### Energy Efficiency Optimization for Industrial Facilities

WINGS has a vast expertise in energy optimizations, obtained through years of R&D and commercial interactions.

We provide optimizations for factories, cities / neighborhoods, buildings, leveraging on advanced metering algorithms, fault management schemes, and advanced optimization mechanisms.

- Optimum choice of fuel to air ratio for boiler combustion
- Optimization in utilization of heat exchangers or parallel system of multiple heat exchangers
- We achieve energy savings in factories

### Our Expertise

We build innovative solutions based on our expertise in high tech areas:

- IoT / Edge Intelligence
- Networks (4G, 5G, B5G, Wi-Fi, LoRa), Core Cloud, Big Data
- AI / Trustworthy AI / Cybersecurity
- Visualization: web / mobile / XR

WINGS exploits Advanced Technologies to deliver Digital Solutions for Air Quality and Natural Environment Protection (AIRWINGS), Utilities (ARTEMIS), Transportation Infrastructures (WINGSPARK), Aquaculture (AQUAWINGS), Agriculture (AGNES), Industry 4.0 / 5.0 / Industrial IoT / Logistics (WINGSChariot), Health and Wellness (STARLIT).



Technologies for  
**SMART MANUFACTURING**  
to Unleash Productivity, Resilience  
& Sustainability



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WINGS Solutions for Smart Manufacturing

# Increase Production Rate with Integrated Technologies

## AGNES Agriculture Livestock Food Factory



### Agriculture

- Enhanced monitoring and alert notification. Leaf volume, pest detection, crop yield, hydric stress, nutrient imbalance, environmental impact.
- Optimal pest management. Alerts on plant-parasitic diseases, optimal regimes and pest management schedule.

- Insights and predictions for effects on key ecosystem services. Soil biodiversity, plant health, pollination potential, pest resistance, water quality, GHG emissions.
- Optimized strategies for organic farming conversion.
- Traceability of fertilization and pest management inputs.

### Livestock

- Biomass estimation with video analysis
- Disease prevention and mitigation
- Optimal Feeding

### Food Factory

- Real time detection and notification in food quality aspects
- Traceability in all production processes

## AQUAWINGS Aquaculture



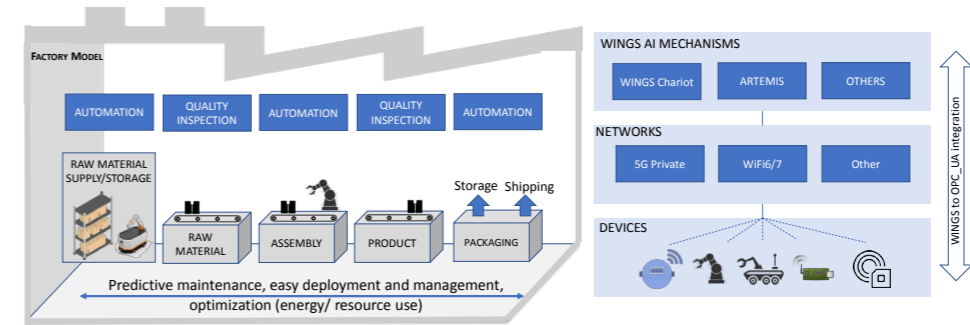
### AQUAWINGS

A holistic solution that delivers enhanced monitoring and management of farm operations and production planning. AQUAWINGS delivers the necessary innovations for sustainable fish farms: fish behavior analysis, intelligent feeding, and water quality analytics. Fish farmers possess complete control and actionable insights over their farm.

### Benefits

- Feed loss decrease by 10%
- Production improvement by 6-7%
- Reaching 10% reduction in production costs (OPEX and CAPEX)
- Real-time monitoring of the fish farm 24/7 (from 1 to 2 readings per day to hourly or more frequent readings)

# Smart Sustainable Factory



### Smart Manufacturing

Use of robotics (AGVs/AMRs, Arms), AOI (Automatic Optical Inspection), video analytics, context (sensing, localization, maps), optimizations (route, storage, resources) and Digital Twins.

Predictive maintenance - advanced analytics and machine learning which automatically generate information about the situation of the machinery and their maintenance needs. Development of advanced information visualization solutions to provide personalized information to the stakeholders.

Quality assurance - system of sensors and/or visual media (camera) which applies in primary sector as well as in Manufacturing / Food processing sites that can inspect and detect quality issues in real time.

Asset management - real time status and location tracking of connected devices which can be displayed in 3D environment. Optimization of energy efficiency, carbon footprint minimization, resource use optimization, further goals. Interface with SCADA, leverage on OPC-UA, with legacy information systems

# Address Manufacturing Challenges

## WINGSChariot Smart Warehouses and Intelligent Transportation



### Facilities Management

- Entry / exit control point automation
- Geofencing
- Security (cameras / sensors, drones, others)
- Environmental monitoring (air, water, noise, others)
- Intelligent gateway for water / gas / energy infrastructures

(demand prediction, recommendations on cost saving/ friendliness etc.)

• Digital Twin - A dynamic virtual copy of a physical asset, system or environment that looks like and behaves identically to its real-world counterpart.

### Warehousing

- Autonomous inbound & outbound operations - AGV / AMR enabled
- Intelligent order management & storage optimization algorithm
- Decision support / simulation engine for optimum warehouse layout.
- Teleoperation of robotic systems

### Transportation

- Remote cargo condition monitoring & control (temperature, humidity etc.)
- Dynamic delivery route optimization based on real-time data
- Driving behavior and vehicle performance
- Predictive fleet maintenance