DISTRIBUTED AUTOMATION FOR INDUSTRY 4.0

Distributed intelligence for Industry 4.0: from proactive hypervision to its activation through automation

AN ALTEN – SCHNEIDER ELECTRIC JOINT OFFER

ALTEN and Schneider Electric join forces to accelerate the adoption of use cases linked to this industrial revolution and enable them to be scaled up

Distributed AI | Smart automation | Green Factory 4.0

ALTEN

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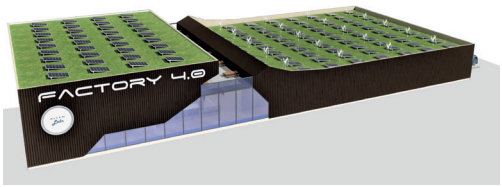
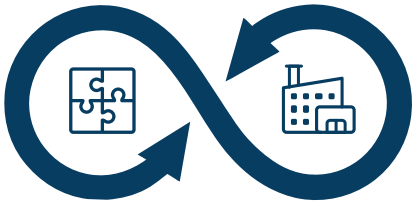
ALTEN AND SCHNEIDER ELECTRIC VISION OF FACTORY 4.0

By focusing on reliable, efficient and sustainable processes, the move towards Factory 4.0 aims to optimise the value chain, while considering energy management and sustainable development.

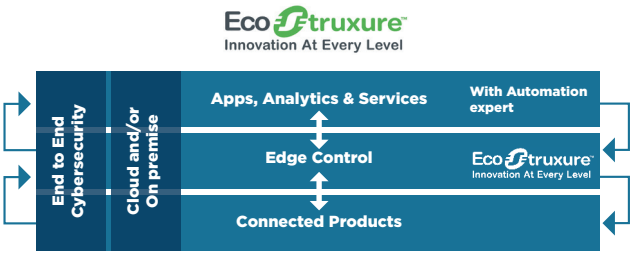
To better link design and production and thus reduce the Time to Market of products, ALTEN joins forces with Schneider Electric to offer solutions and engineering expertise around four pillars.



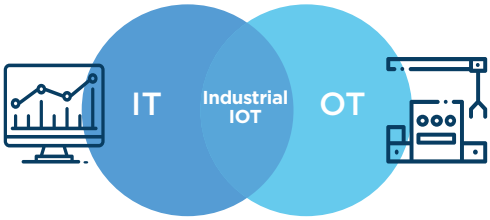
Operational Excellence in Lean 4.0



Equipment performance & Contextualised data



Infrastructure & Cybersecurity through IT/OT convergence



Energy management & Sustainable Development

EcoStruxure™ solution to benefit from an ecosystem

ALTEN promotes and integrates the EcoStruxure™ platform along 3 axes:

- A single platform covering all industrial needs, from simple applications (monitoring, etc.) to complex applications (intelligent supervision, etc.)
- A single, hardware-independent platform
- An open platform based on the IEC 61499 norm federating an ecosystem of users and suppliers

UNIVERSAL AUTOMATION.ORG

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SUPPLIERS COMMUNITY

USERS COMMUNITY

INDUSTRIAL CUSTOMERS

INDUSTRIAL PARTNERS

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Alongside the communities federated by Universal Automation.org and Schneider Electric, ALTEN is integrating, for the benefit of its customers, the full range of solutions combining sobriety and efficiency with its own ecosystem of partners such as STMicroelectronics to develop intelligent sensors.

OUR OFFER TO COVER ALL NEEDS

To enable the implementation of these solutions in each industrial context, ALTEN provides its customers with engineers from 3 excellence practices for end-to-end support.

SMART FACTORY 4.0 capabilities

IT-OT Convergence

Digital Twin

Embedded Connectivity & Intelligence

	Europe	World
INDUSTRIAL IoT	250	550
ROBOTICS | COBOTICS	300	400
AMR | AGV | AUTONOMOUS VEHICULE	250	400
NEW MATERIALS & PROCESSES | ADDITIVE MANUFACTURING	200	250

Smart Operations

	Europe	World
MOBILE INTEGRATION | CONSUMER IoT	660	850
SIMULATION | BIM & PLM | DIGITAL TWIN	450	700
AUGMENTED TRAINING | METAVERSE	150	250
GENERATIVE AI | WEB 3	100	160

Cloud Connected Digital Services

	Europe	World
AI EMBEDDED & EDGE COMPUTING	300	700
CYBER SECURITY	140	300
BIG DATA & CLOUD COMPUTING	500	700
ARTIFICIAL INTELLIGENCE PRESCRIPTIVE	150	200

Methodology

AUDIT
- Analysis of the as is situation
- Definition of the 4.0 bricks with added-value

MODELLING
- Factory modelling
- Simulation of 4.0 bricks

IMPLEMENTATION
- Connecting the digital twin
- Training of plant staff

HYPERVISION
- Implementation of an intelligent factory control tower
- Real-time monitoring

OPTIMISATION
- Consideration of business feedback
- Learning of alert and prescription models

TECHNOLOGY BRICKS 4.0

1. **Optimisation** of the IT/OT connection for real-time update of the digital twin
2. **Automating** data and images processing and preparation with AI in the Edge and Cloud
3. **Integration** of intelligent IoT sensors for data processing close to the machines
4. **Setup** of real-time control of machines and factory
5. **Implementation** of Machine Learning in the factory
6. **Interaction** of the Intelligent Hypervisor with its users
7. **Implementation** of mixed reality solutions to assist operators
8. Life cycle **analysis** and energy performance assessment

Customer use cases

Energy Efficiency | AI Vision | Process performance

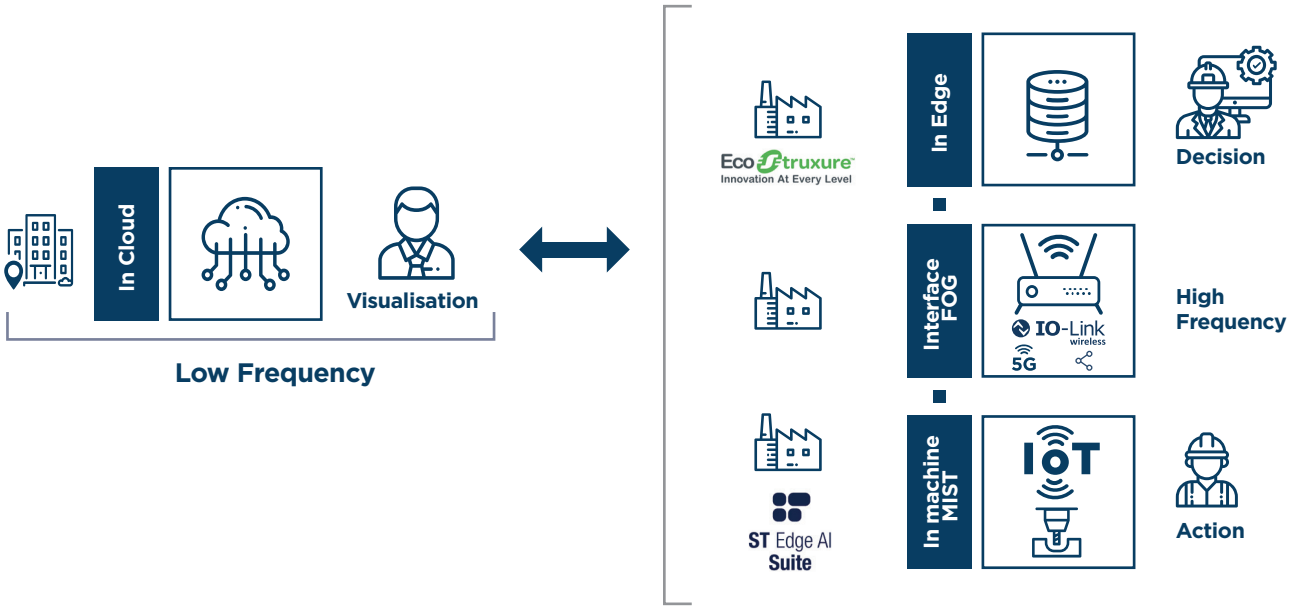
Intelligent variable speed drive | Prescriptive maintenance

TO GO FURTHER WITH STMICROELECTRONICS X ALTEN X SCHNEIDER ELECTRIC

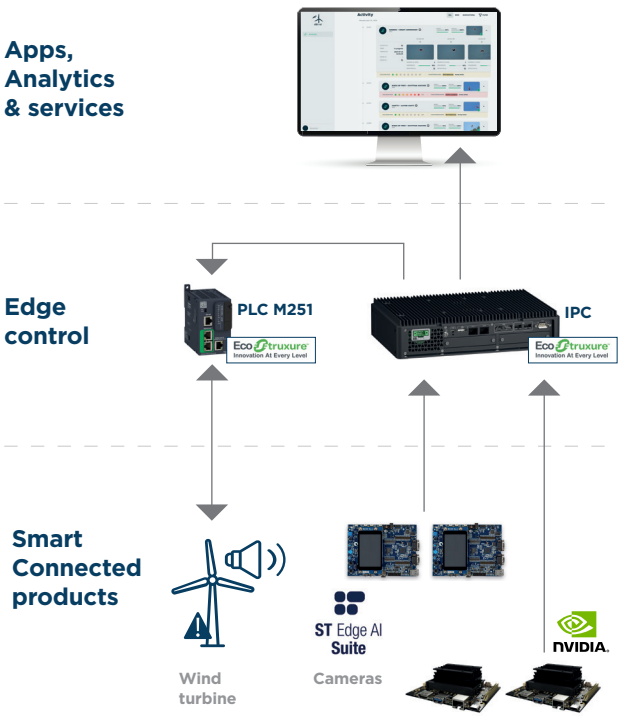
From intelligent sensor to intelligent product

In the context of predictive maintenance of cutting tools for an aeronautical player, we were able to develop a smart sensor to directly process physical behavior of the machine to predict anomalies and defects and thus prescriptive maintenance actions.

Use of embedded AI to process high-frequency vibration data (STM32 NanoEdge AI) correlated with real-time data from the factory (EcoStruxure™ Automation Expert) has made it possible to increase the lifetime of cutting tools by up to 30% and to avoid production disruptions.



Smart Wind Turbine



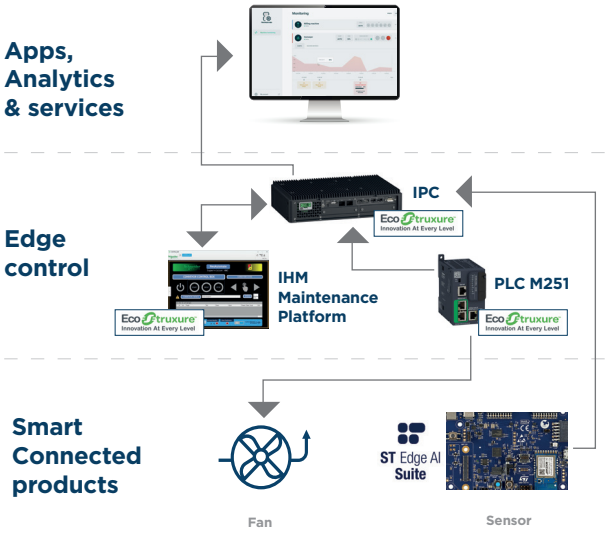
CONTEXT AND ISSUES

Every year in France, collisions between wind turbines blades and birds cause the death of 56,000 specimens. These ecological consequences are also an economic issue, with the risk of financial penalties of up to 3,000 euros per day under regulations on the protection of animal species.

SOLUTION AND BENEFITS

By implementing a Green Edge AI solution, the most effective countermeasures can be taken in real time to protect birds. The solution must detect and classify bird activity in order to control the wind turbines and avoid collisions.

Smart Air Conditionning



CONTEXT AND ISSUES

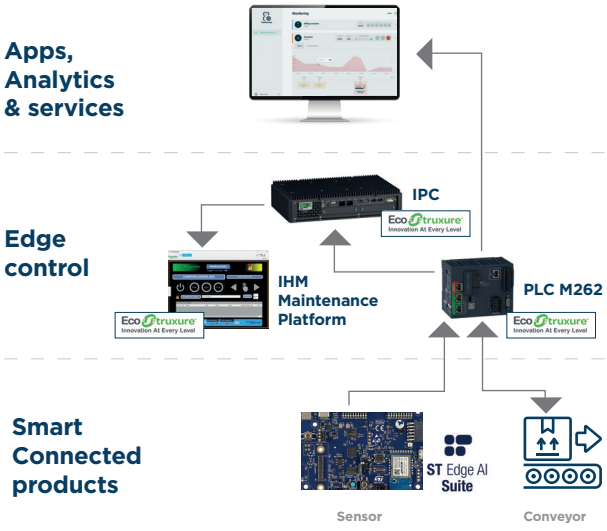
Prescriptive maintenance on HVAC equipment offers a number of advantages that help to generate savings by optimising maintenance actions, reducing the number of breakdowns and increasing the lifespan of HVAC (Heating, Ventilation and Air Conditioning) equipment.

SOLUTION AND BENEFITS

The study of equipment vibrations using an intelligent sensor enables anomalies to be detected:

- Reduce unplanned downtime by up to 70%
- Saves human resources by avoiding unnecessary travel and improving the efficiency interventions
- Improved comfort for occupants by avoiding service disruptions
- Rationalisation of spare parts stock management
- Saving 40% on energy consumption in HVAC systems with the help of Schneider Electric by combining a variable speed drive and a logic controller

Smart Conveyor



CONTEXT AND ISSUES

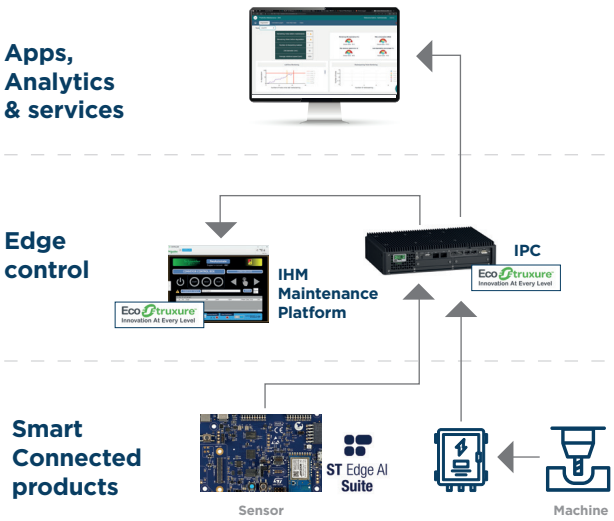
Smart conveyors enable operators to have real-time access to information, allowing them to ensure the efficient operation and maintenance of baggage sorting systems in a highly responsive manner. Several challenges to ensure the smooth transportation of baggage to its destination with maximum availability, while also ensuring regulatory compliance and security.

SOLUTION AND BENEFITS

The study of conveyor vibrations using intelligent sensors makes it possible to:

- Improved performance thanks to better knowledge of field equipment
- Better management of human resources, with an 80% reduction in equipment inspection rounds
- Reduced costs, with a 30% cut in preventive maintenance
- Hundreds of technical hours optimised every year

Smart Machine



CONTEXT AND ISSUES

Unlike inductive sensors, whose magnetic field is used to detect a part and send a command to the automated system, the intelligent sensor communicates directly with the machine's computer to transmit intelligent information based on real-time physical measurements. This on-board AI coupled with the intelligence of the automated system will increase the machine's autonomy, flexibility and productivity, while reducing waste and production non-conformities.

SOLUTION AND BENEFITS

Installation of an intelligent sensor enabling a numerically controlled milling machine to optimise machine behaviour according to cutting tool wear, providing the following benefits:

- Increased tool life
- Reduction in tool-related non-quality and waste
- Adapt cutting parameters according to tool wear

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VISION, COMMITMENT, OPPORTUNITIES,

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