



## **ULMA** EMBEDDED SOLUTIONS

*A Unique Collaborative Experience*

**David Sierra**

Business Development Manager

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# The impact of test, data, monitoring and automation

# Index



- . About ULMA
- . Test automation
- . Electronics test
- . Lab automation
- . Complex measurement systems
- . Managing remote systems
- . Additional information



ABOUT ULMA

# ULMA Group

**9 Business**  
Units

More than  
**60 years**  
in the market

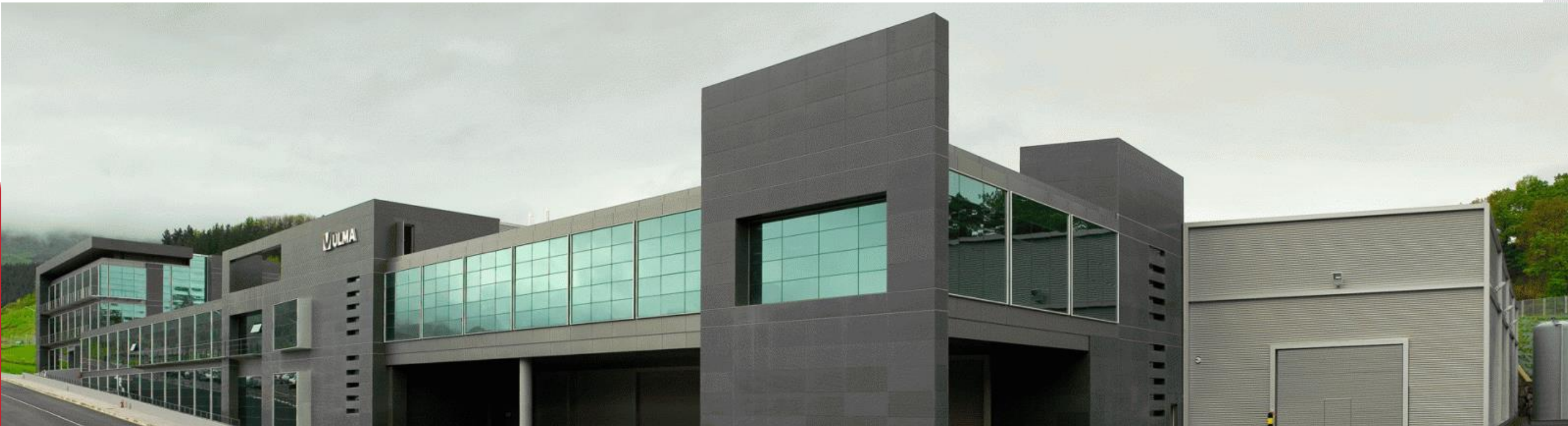
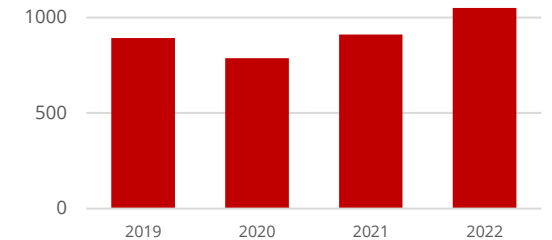
More than  
**6.000**  
Professionals

**Cooperative**  
business



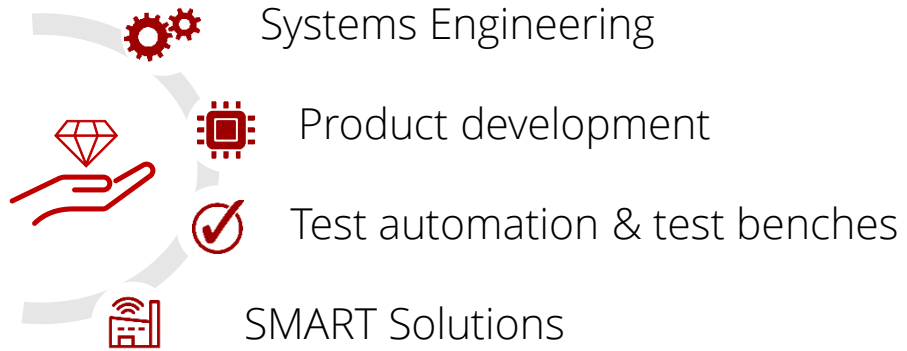
**81** countries    **69** offices

Revenue    **1.050 M€**



ABOUT ULMA

# ULMA Embedded Solutions

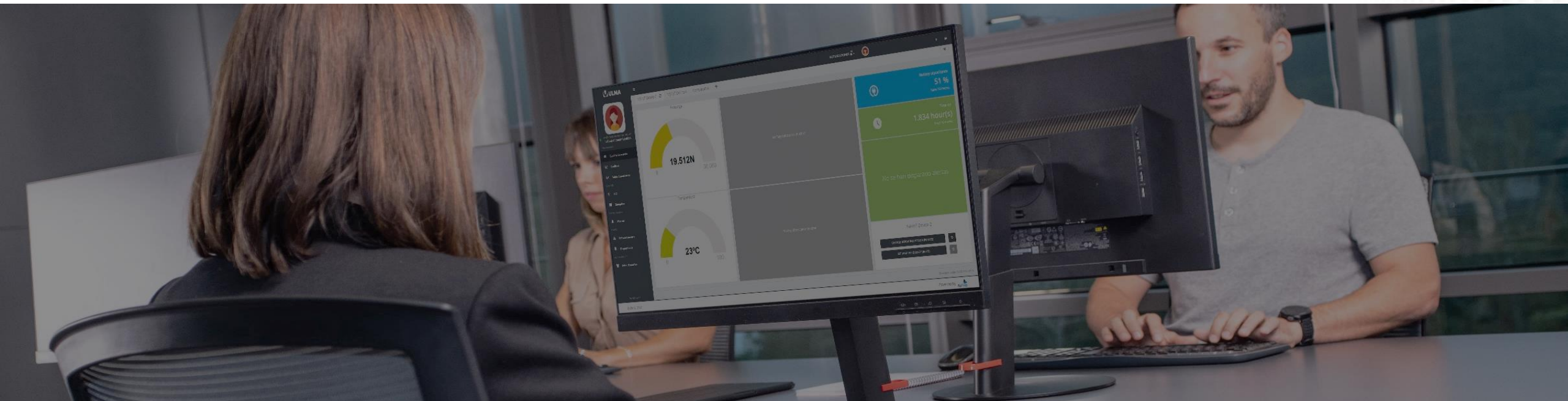


Functional  
Safety engineers & PhDs  
**IEC 61508 / ISO 26262**

Test & Validation Engineers  
**Certified LabVIEW &  
TestStand Architects**

Embedded HW & SW Developers  
**VHDL & Verilog  
Real-Time OSs**

Cloud, CI/CD & Agile  
SCRUM Masters  
**Scrum Masters, AWS, Google**



# They trust us



**indra**

**Applus<sup>+</sup>**

**Navantia**

**LEONARDO**

**EATON**



**FAGOR**

FAGOR INDUSTRIAL

**Bexen cardio**



**vidrala**

**iKOR** SPAIN  
MEXICO  
CHINA

**MADES**



**Ingeteam**

**arteche**

**merytronic**  
gorlan team

**SIEMENS Gamesa**

**CENER**

**P4Q** PROFESSIONALS  
FOR  
QUALITY

**Ciemat**



**BorgWarner**

**faurecia**

**AURIA**

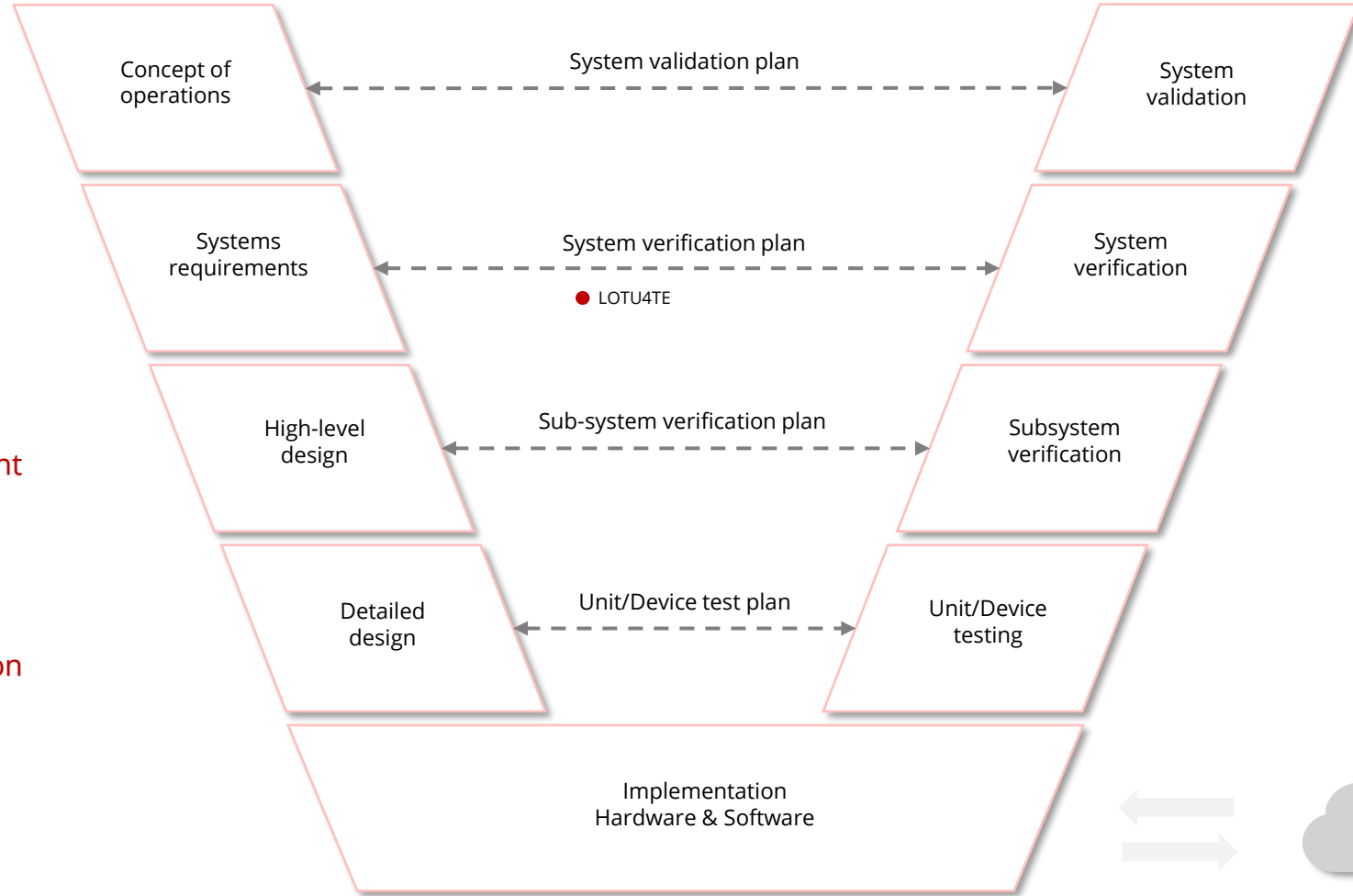
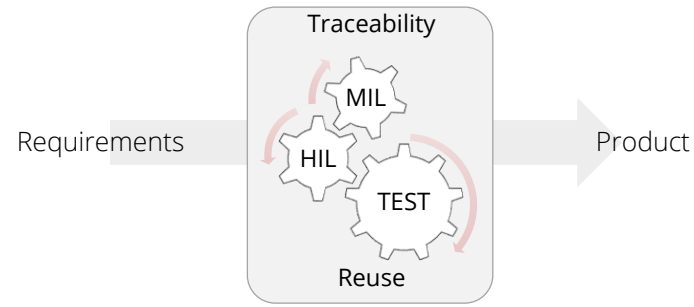
**Valeo**

**CAF**

**CAF** POWER & AUTOMATION  
**CAF** Signalling

**Talgo**

# CAPABILITIES V model



- Development
- Training
- Collaboration

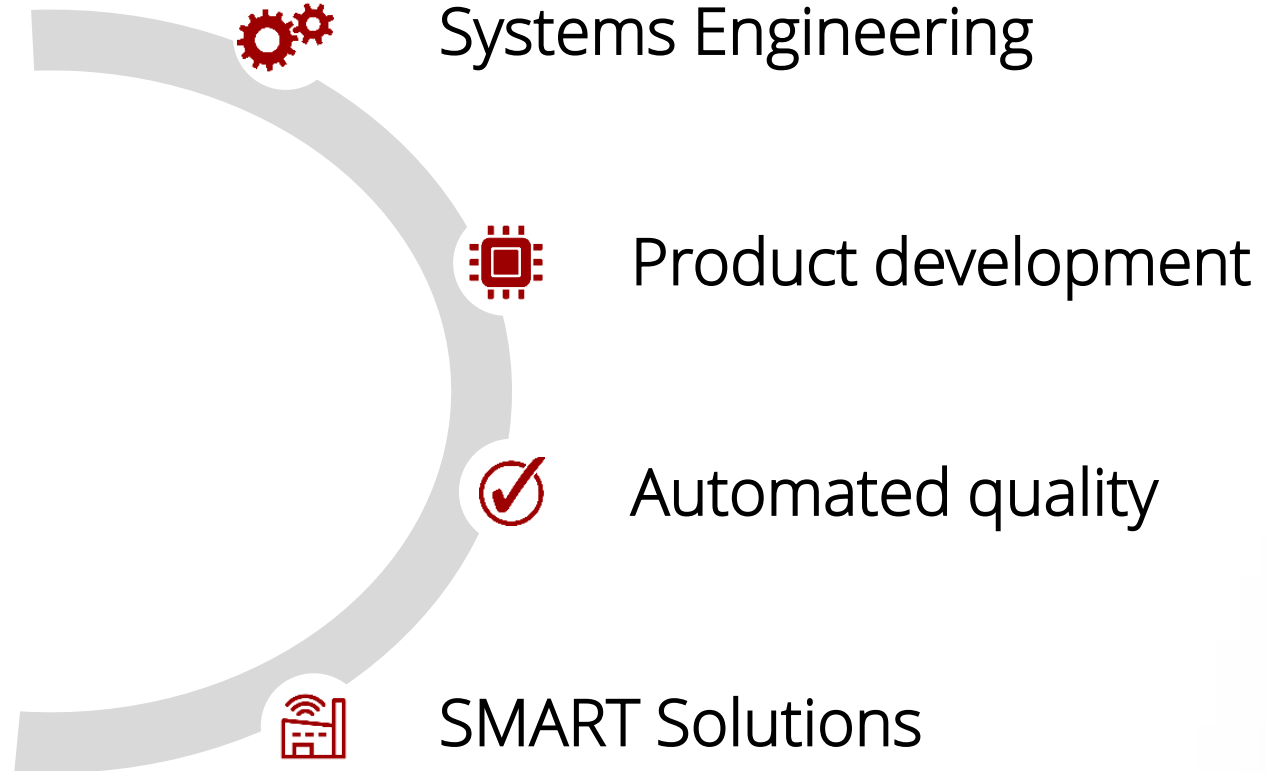
Tools & Technology

6TL Altium iar  
IBM infineon LDRA  
ni Partner SYSTEM INTEGRATION  
pure systems CO\*PRO X TAG  
REUSE company XILINX  
sisteplant





# SERVICES



CAPABILITIES

# Test & Automation



## Electronics Test

- . Offline, inline functional test
- . Fully automated



## Lab Automation

- . Measurement and datalogging
- . Robotics and process automation



## Hardware-in-the-loop

- . Import your models in Real-Time COTS HW
- . Hardcode models in FPGA



## Test Cells

- . Civil engineering
- . Electromechanical design
- . Control & measurement



## Measurement Systems (SCADA)

- . UI and historian databases
- . System interconnection



ELECTRONICS TEST

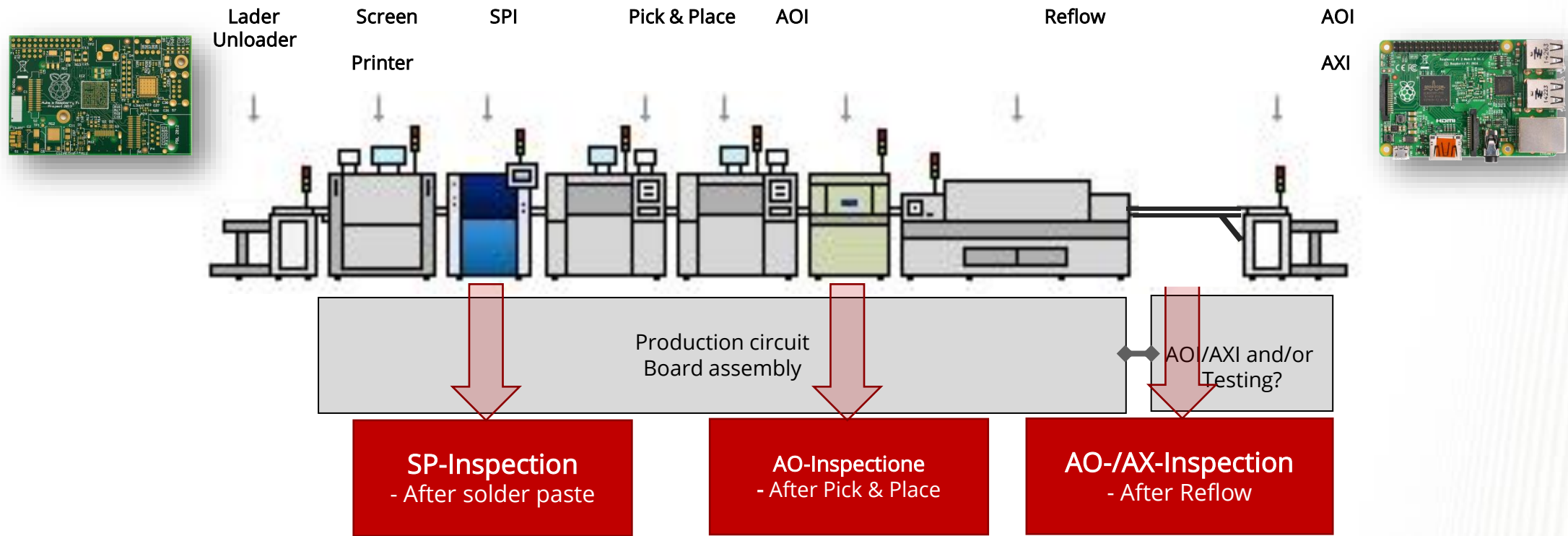
# Consequences of not testing properly

- Replacement costs
- Repair costs
- Redesign costs
- Delayed product launches
- Reduced Brand reputation



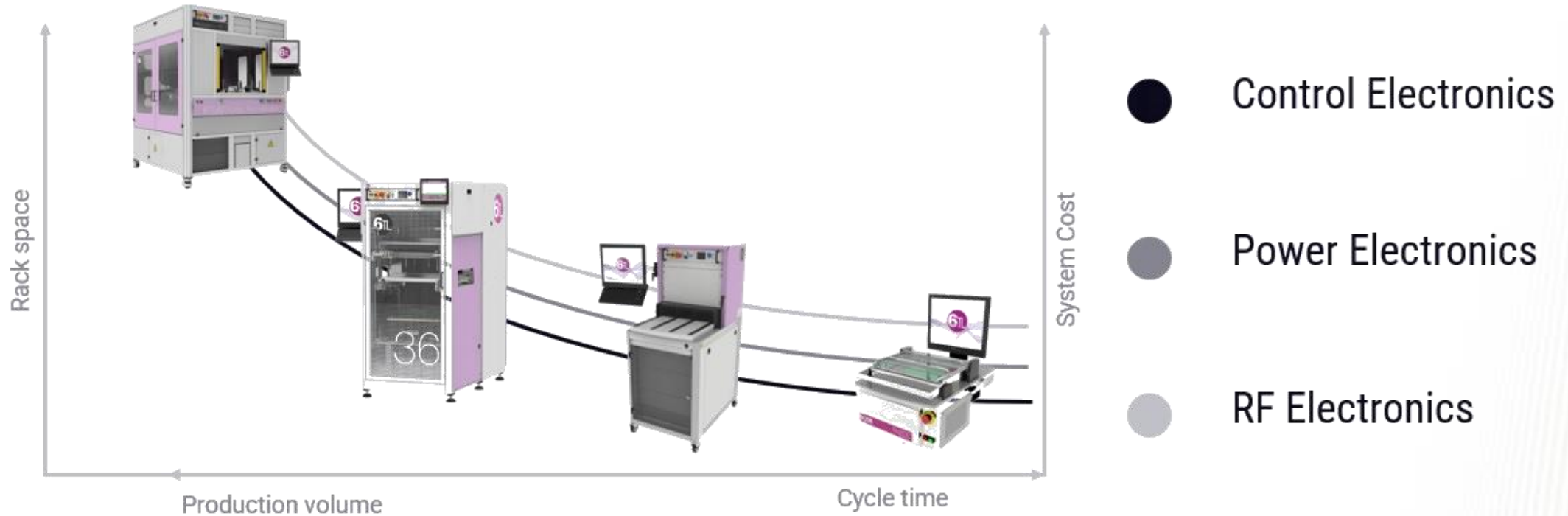
ELECTRONICS TEST

# Test and inspections in a line



ELECTRONICS TEST

# From manual to test automation



ELECTRONICS TEST

# Connection with the fixture

Tester  
Instrumentation

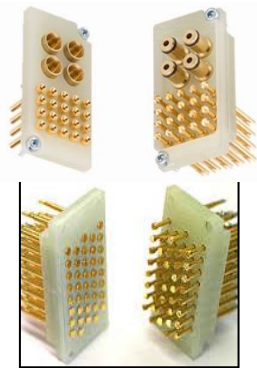
Tester  
Interface



Pylon Interface



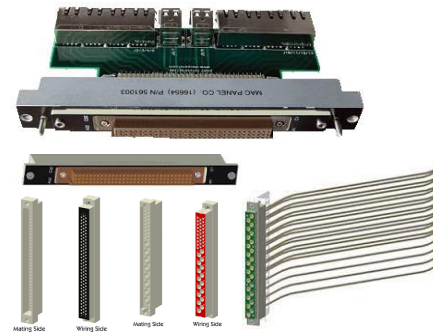
ITA Receiver



MacPanel Interface



ITA Receiver



VPC Interface



ITA Receiver



## INDUSTRY – TEST AUTOMATION

### EOL Automated test platform

#### NEED

- Simulation & Signal intensity measurement of GPS & GLONASS
- Radio Signal emission & reception test
- Bluetooth Signal emission & reception test
- Other tests

#### SOLUTION

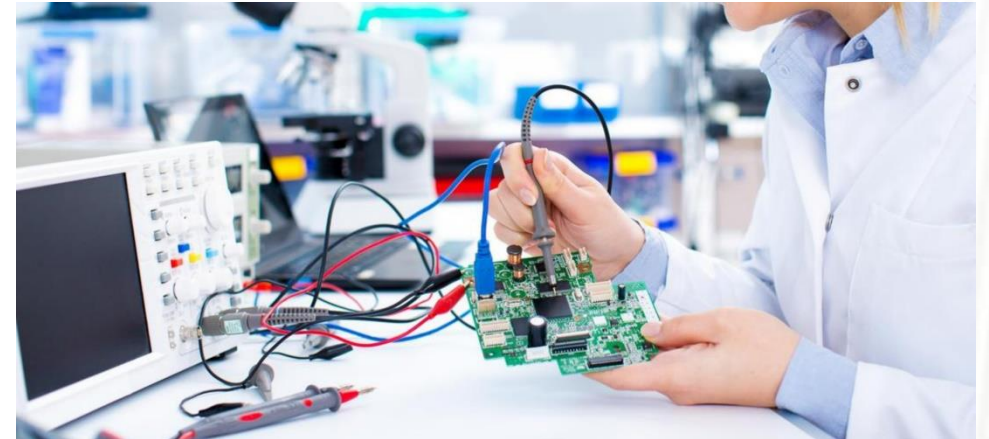
- Instrumentation:
  - . Pendulum: GPS Signal Generator, 1 Channel GPS tester. Includes GPS y GLONASS
  - . Rhode-Schwarz: Wireless Connectivity Tester R&S CMW270 with SW options: KT057, KS611, KS721, KM611, KM721 and R&S CMWrun Tool\*\*\*\* using BLE PHY 5.0.0.
  - . Other
- Signals:
  - . Simulation of GPS1 in L1 Band, GPS2 & GLONASS in L2 Band
  - . DUT broadcast RF Signal verification- 866.55 MHz, 915 MHz frequencies, verifying -14 dBm power
  - . DUT RF Signal reception verification - 866.55 MHz, 915 MHz frequencies, verifying -70 dBm power
  - . DUT Bluetooth Signal broadcast and reception verification - Mean and Maximum signal power measurement / Received data packages verification



## LAB AUTOMATION

# Automation in the lab

- Reproducibility and repetitiveness
- Better data
- More time to focus on research
- Reduce environmental impact
- Enable tests which could not be done in the past





## LAB MEASUREMENT SYSTEMS

### Challenge

- Critical system to ensure radiotherapy can be applied safely to patients
- System cannot become obsolete
- Level of service, availability and capacity must be increased

### Solution

- Deep analysis of automation needs
- Translation of scientific knowledge into automated sequences
- Reuse of existing lab instruments and infrastructure



✓ Open SW

✓ Repetibility

✓ Modular &  
Scalable

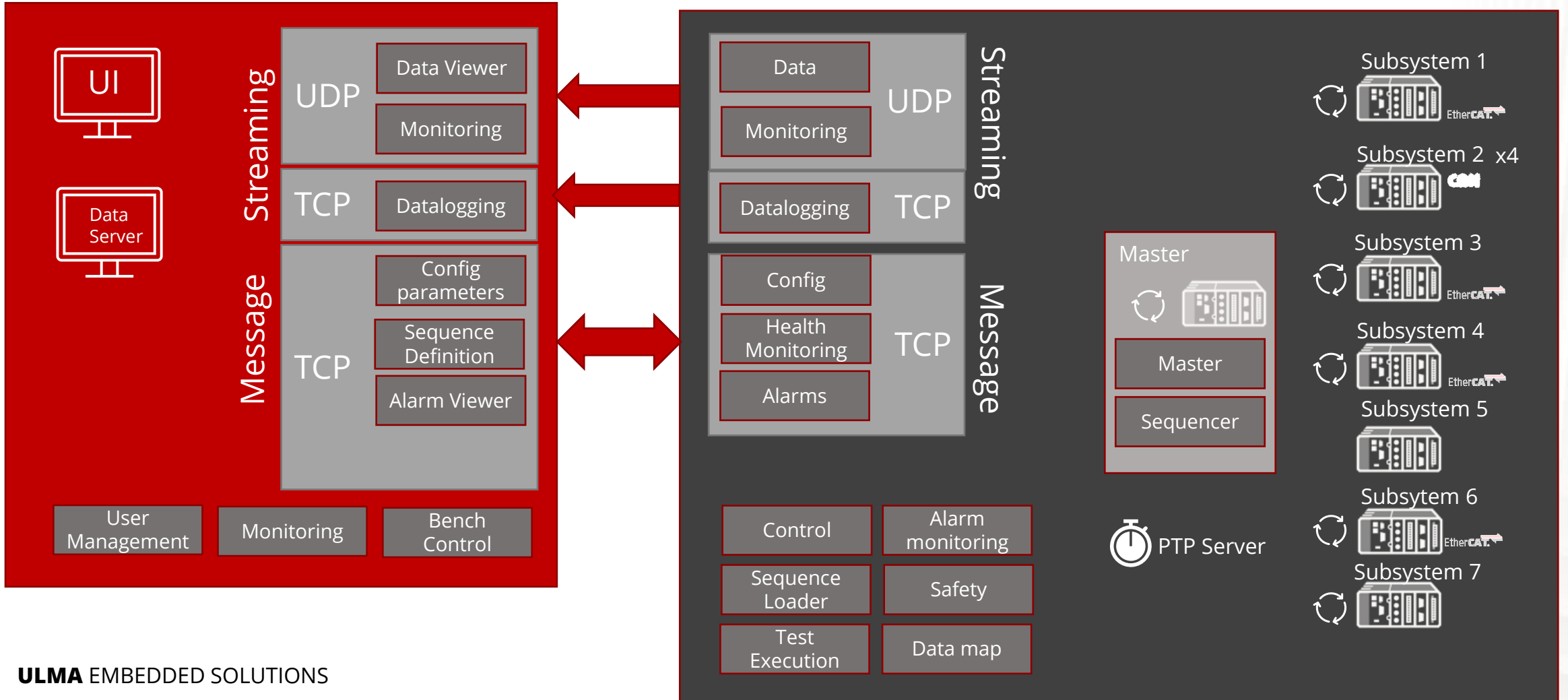
✓ Sync to other  
European labs

# Complex measurement systems



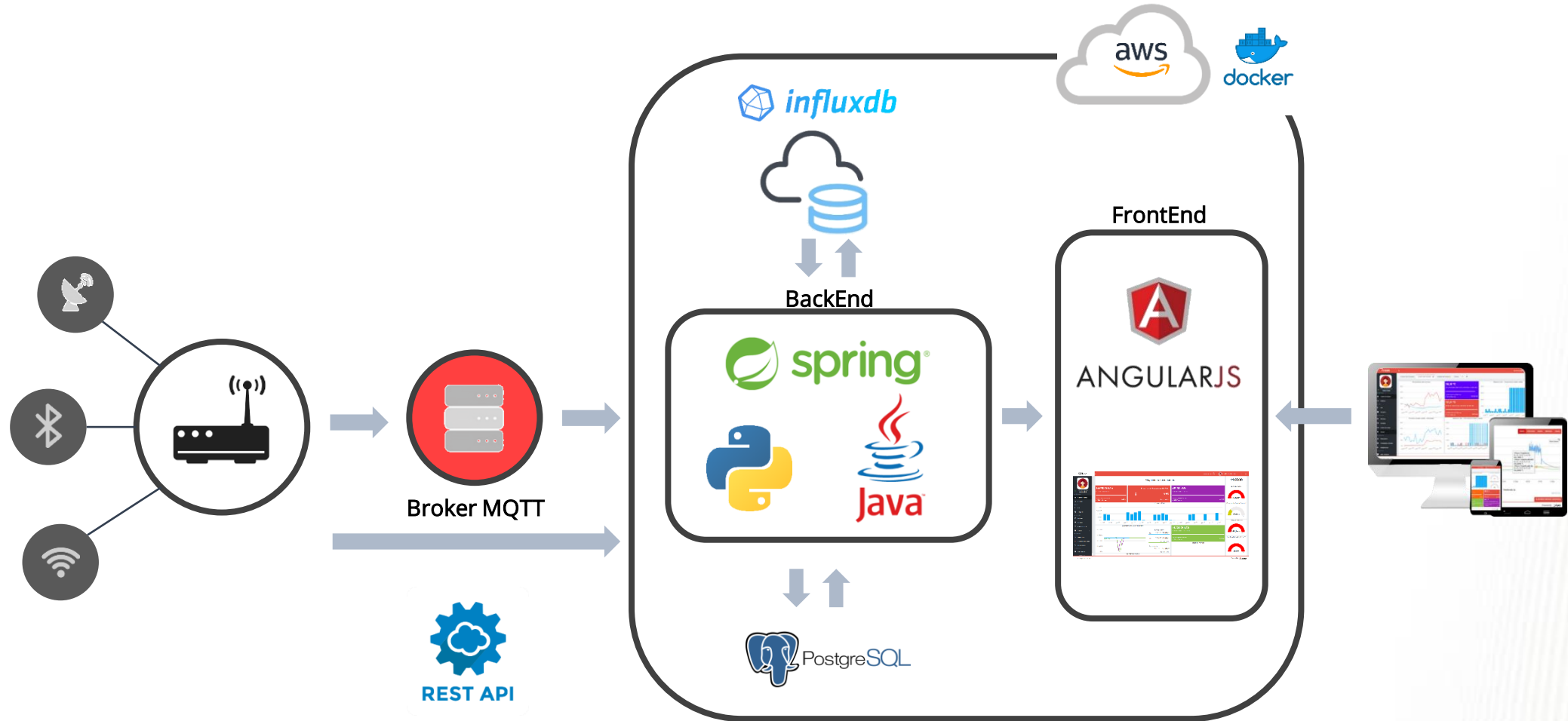
- Critical installation: failure can make provoke great damage
- SW is a critical component
  - Real-Time OS
  - FPGA
- Sync of several systems
- High level of interdependency between subsystems
- Large number of signals and data

# System diagram



REMOTE MONITORING

# LORE IoT platform



INDUSTRIAL – PRODUCT DEVELOPMENT & IoT SOLUTION  
Rolling monitoring system for mining

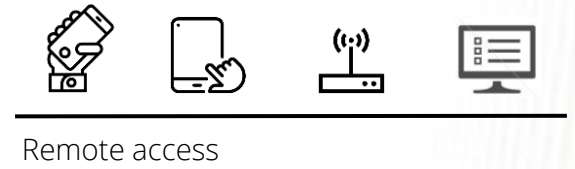
SOLUTION



Sensor node



Gateway



Remote access

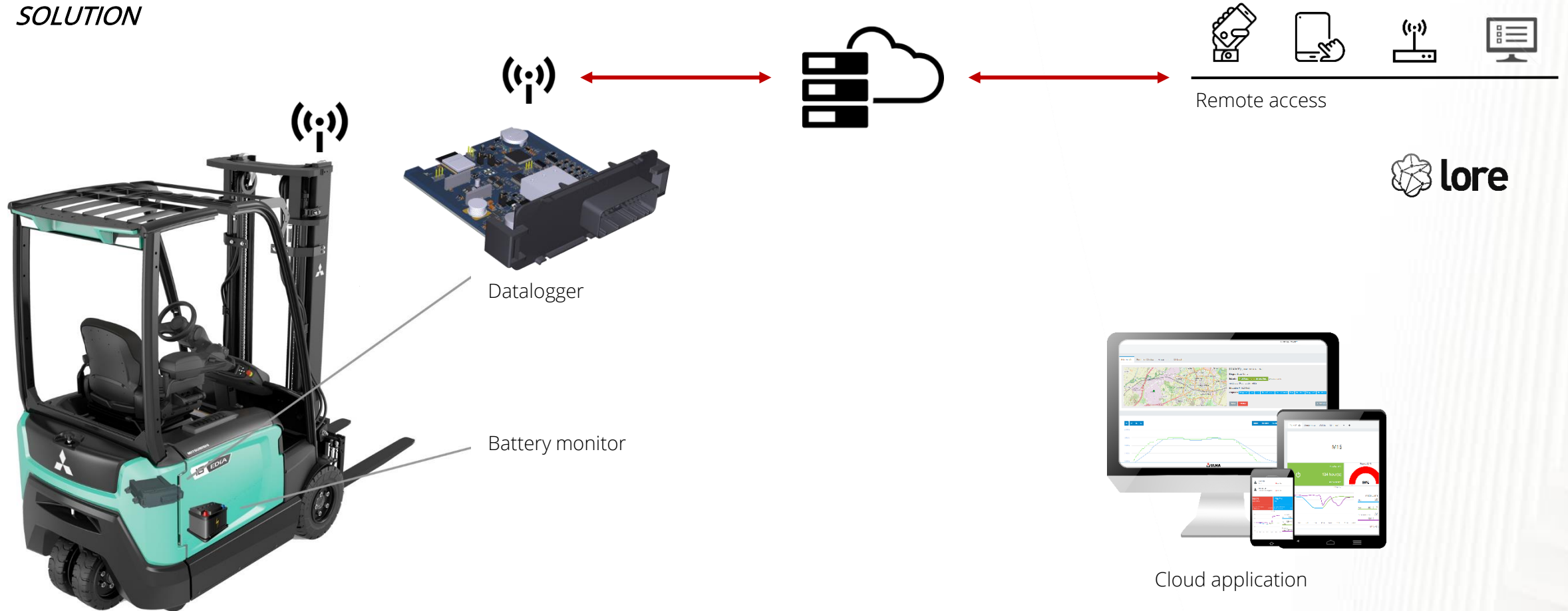


Cloud application

# INDUSTRIAL – PRODUCT DEVELOPMENT & IoT SOLUTION

## Forklifts fleet monitoring system

### SOLUTION



## ROLLING MONITORING SYSTEM FOR MINING

### Challenge

- Solution for rollers predictive maintenance
- Custom sensor
- Data acquisition, transmission and analysis
- Front end application

### Solution

- Custom sensor and gateway
- Asset management, predictive maintenance, remote support, guarantee management



✓ More competitive product

✓ Reduced maintenance cost

✓ Increased value for end user

## FORKLIFTS FLEET MONITORING SYSTEM

### Challenge

- Control renting forklifts
- Usage information (time, driver,...)
- Error reports
- Battery status
- Front end application

### Solution

- Datalogger integration on the forklifts
- Web based platform for data visualization
- Predictive maintenance



✓ Business transformation

✓ Reduced CO2 footprint

✓ Safety

✓ Productivity

✓ Cost



ADDITIONAL INFORMATION

# Partners and alliances

## TECHNOLOGY

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## ENGINEERING

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## UNIVERSITY

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ADDITIONAL INFORMATION

# Certifications



Functional safety engineers  
for HW/SW design according  
IEC 61508& ISO 26262



IBM Rational DOORS & DNG  
IBM Rational Rhapsody  
IBM Rational Quality Manager



Preferred Design  
House



Professionals for  
requirements engineering  
Foundation Level



NI Certified LabVIEW  
Architect/Developer/Champion  
NI Certified TestStand Developer  
NI Certified Professional Instructor



ISO9001  
ISO 33000 · L2  
(SPICE)



CTFL Professionals



Vector CANoe



Project Manager  
Professionals



The Reuse Company  
Knowledge Manager (KM)



Innovative SME

## ADDITIONAL INFORMATION

# Standards

### Root

- . IEC 61508

### Machinery

- . ISO 13849
- . IEC 62061
- . IEC 61800-5

### Agriculture

- . ISO 25119

### Avionics

- . DO 178
- . DO 254

### Railway

- . EN 50126
- . EN 50129
- . EN 50128
- . EN 50155

### Medical devices

- . IEC 60601
- . ISO 14971
- . IEC 62304

### Space

- . ECSS

### Household appliances

- . IEC 60730
- . EN 60335

### EMC

- . EN 61000
- . EN 55025
- . ISO 7637

### Automotive

- . ISO 26262
- . ISO / SAE 21434:2021

# CONTACT US

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Thank you!

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