

# **XEPICS ITALIA s.r.l.**

Collaborazioni e progetti tra Xepics e Dipartimento di Ingegneria

Perugia – 14 May 2021

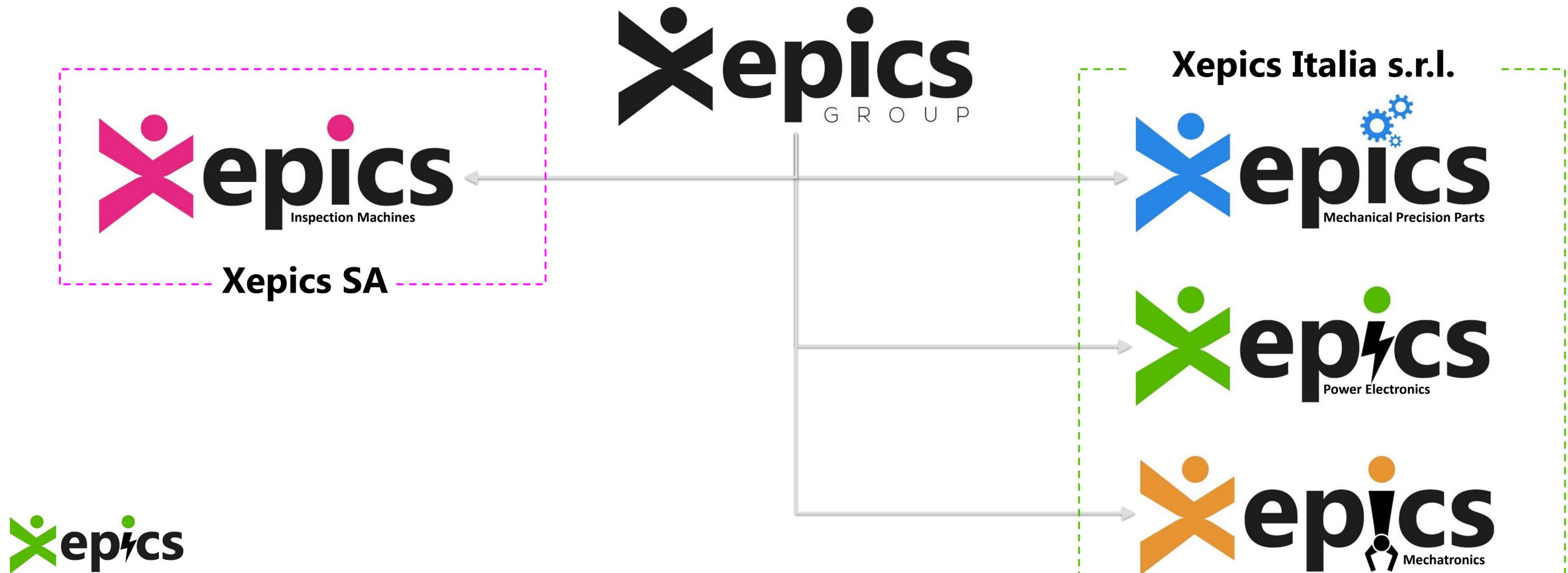
# Xepics Group

## Companies

**Xepics Group Ltd** is a worldwide company based in UK that aims to invest on tech companies. The group, currently, consist of two company: Xepics SA and Xepics Italia.

**Xepics SA** is based in Switzerland and its focus is on design and manufacturing of inspection machines for tobacco, pharma and cosmetics industries.

**Xepics Italia** is based in Italy and its focus is on design and manufacturing **on-board chargers and DC/DC converter** for industrial, automotive and defense sectors. It is structured in three BU: Xepics PE, Xepics MPP and Xepics MT.





**MPP (Mechanical Precision Parts)** is the department focused on production of mechanical parts by CNC machining.



**PE (Power Electronics)** is the department focused on development, production and commercialization of OBC for industrial and automotive market.



**MT (Mechatronics)** is the department focused on development and production of complex mechatronics devices (power electronics + mechanics) based on customer specifications, for industrial, automotive and defense sectors.

MECHANICS  
MANUFACTURING

PRODUCTION  
AREA  
(Industry 4.0)

METROLAB  
AREA

ASSEMBLY AREA

TESTING AREA

DMG MORI 5 Axis CNC Milling Center DMU95 

DMG MORI 5 Axis CNC Milling Center DMU95 

DMG MORI -11 Axis CNC Turning Center - NTX2000 

ZEISS CMM Machine CONTURA 

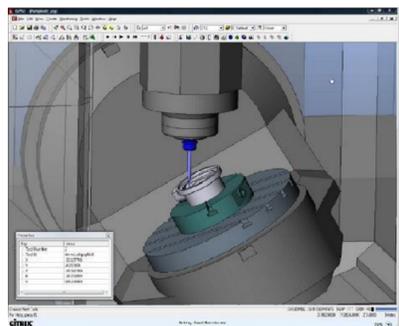
DMG MORI Presetting UNO 20140 

ACCURETECH Profilometer SurfCom NetX30 

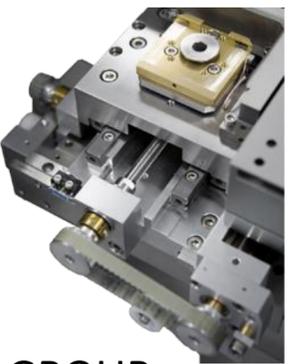
MITUTOYO Altimeter LH-600E 

DEDICATED ASSEMBLY AREA

DEDICATED TESTING AREA NATIONAL INSTRUMENTS PXI Testing Unit 



MANUFACTURING  
CAM



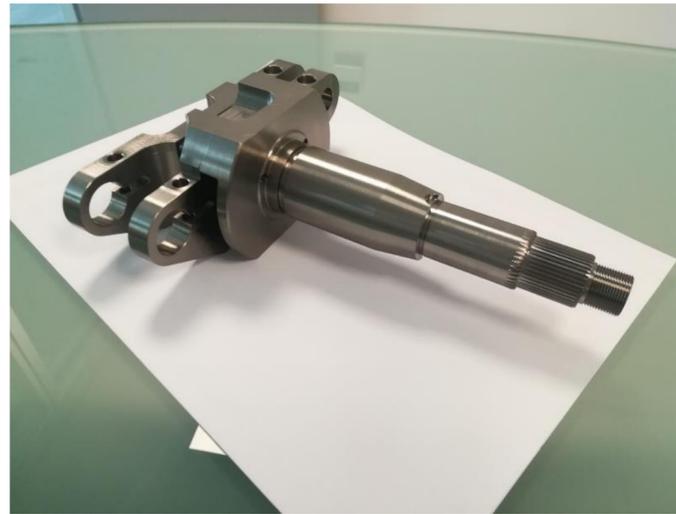
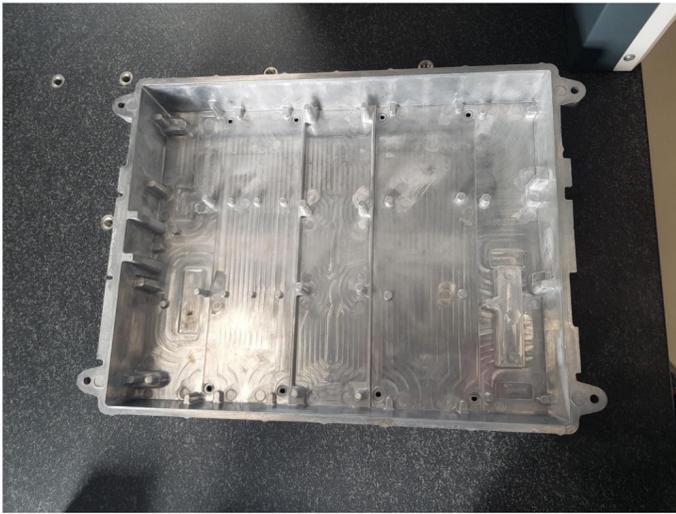
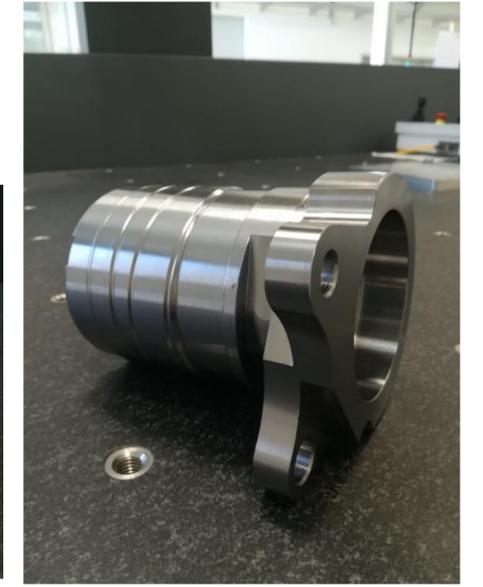
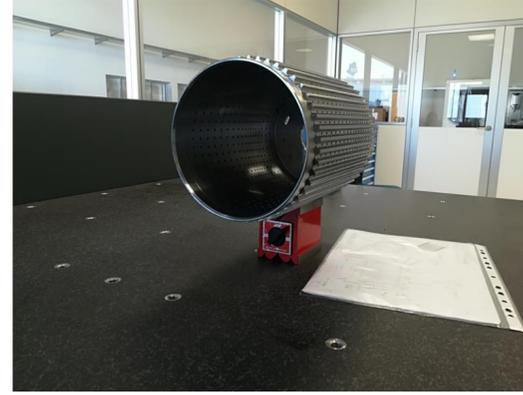
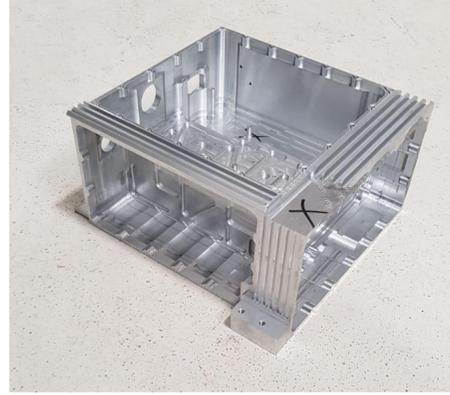
GROUP  
ASSEMBLY

**xepics MPP**  
Mechanical Precision Parts



# xepics MPP

Mechanical Precision Parts



ELECTRONIC ENGINEERING DESIGN

**PRODUCT CERTIFICATION SUPPORT**  
 (PRE-COMPLIANTS IN HOUSE, CERTIFICATION ON CERTIFIED LABORATORY; CUNSLTANT SERVICE TO FIX NOT CONFORMITIES)

Measures and Characterizations, Failure Analysis, PS stability analysis

ASSEMBLY AREA

TESTING AREA

**Conducted emission**  
 Tektronix Spectrum Analyzer RSA306B; Several types of LISN

**Radiated Emission 9kHz – 1Ghz**  
 Tektronix Spectrum Analyzer RSA306B; Several types of antennas

**Climatic Test**  
 ACS DM600

**ESD and Electrical tests**  
 ESD gun TESEO NSG438; Electrical safety tester GwInstekGPT-9903A; Elektro-Automatik Power Supplies & Active loads; Arbitrary function generator; etc...

Tektronix MSO56,5 6-Ch High voltage, high current probes, Power Measurements software module

Termocameras, LCR Meter, Multimeter, Function generator, Power supplies and active loads, Visual Inspection, Stereomicroscope, etc...

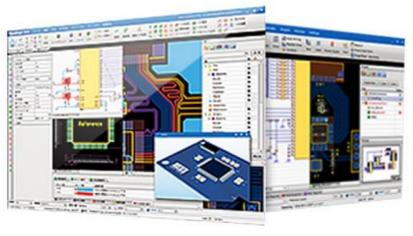
DEDICATED ASSEMBLY AREA

DEDICATED TESTING AREA

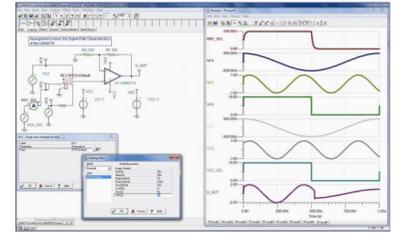
END-LINE TEST EQUIPMENT DESIGN AND PRODUCTION (BASED ON NATIONAL INSTRUMENTS HW)



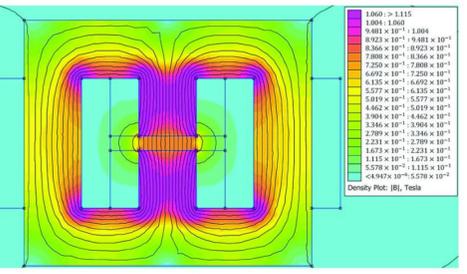
FUNCTIONAL SAFETY



ELECTRONIC HARDWARE DESIGN



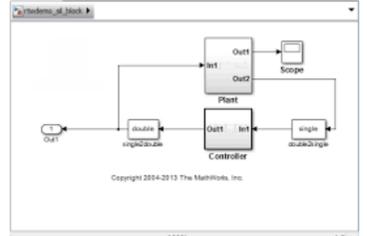
ANALOG/DIGITAL SIMULATION



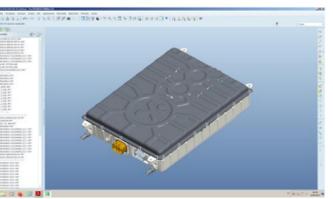
ELECTROMAGNETIC FEM



FIRMWARE DEVELOPMENT



SIM/MIL

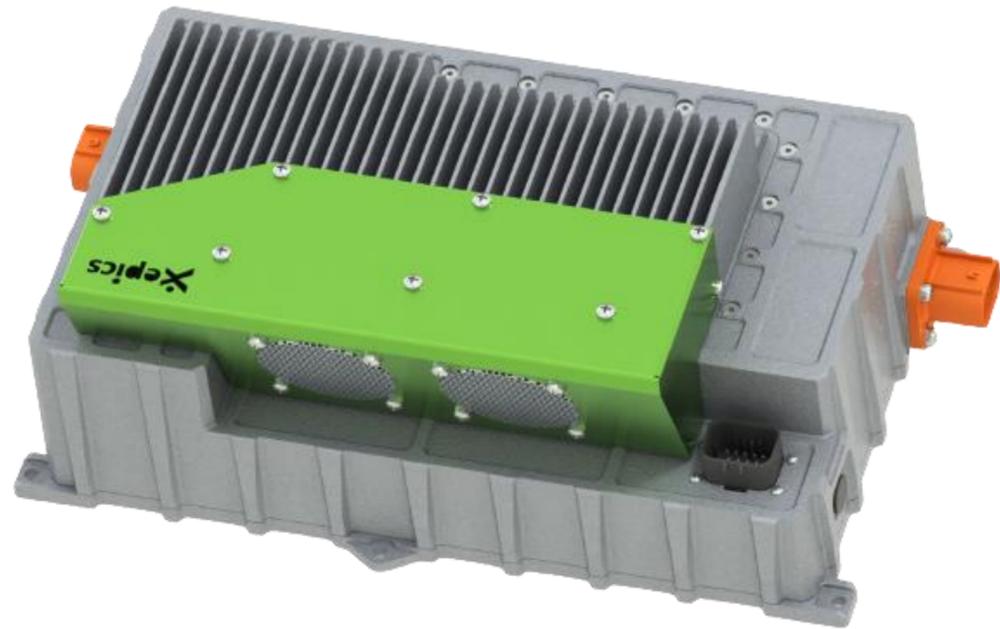
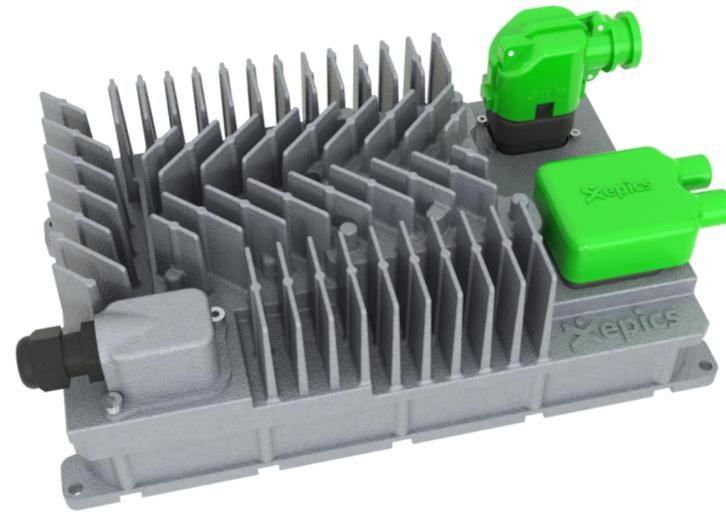
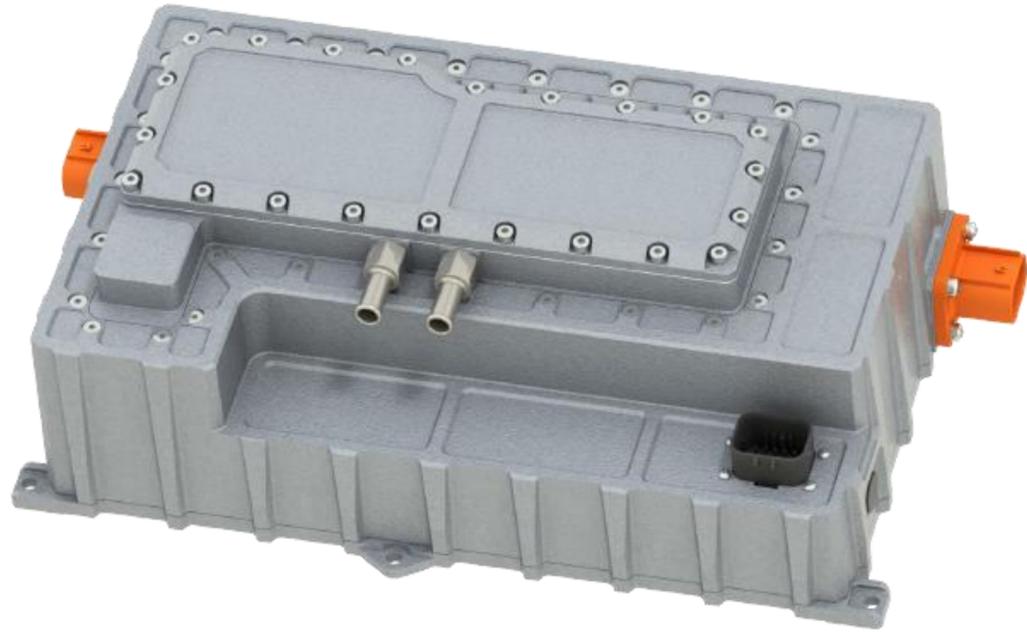


CAD 3D MODELLING & DESIGN



# xepics PE

Power Electronics



# epics PE

Power Electronics

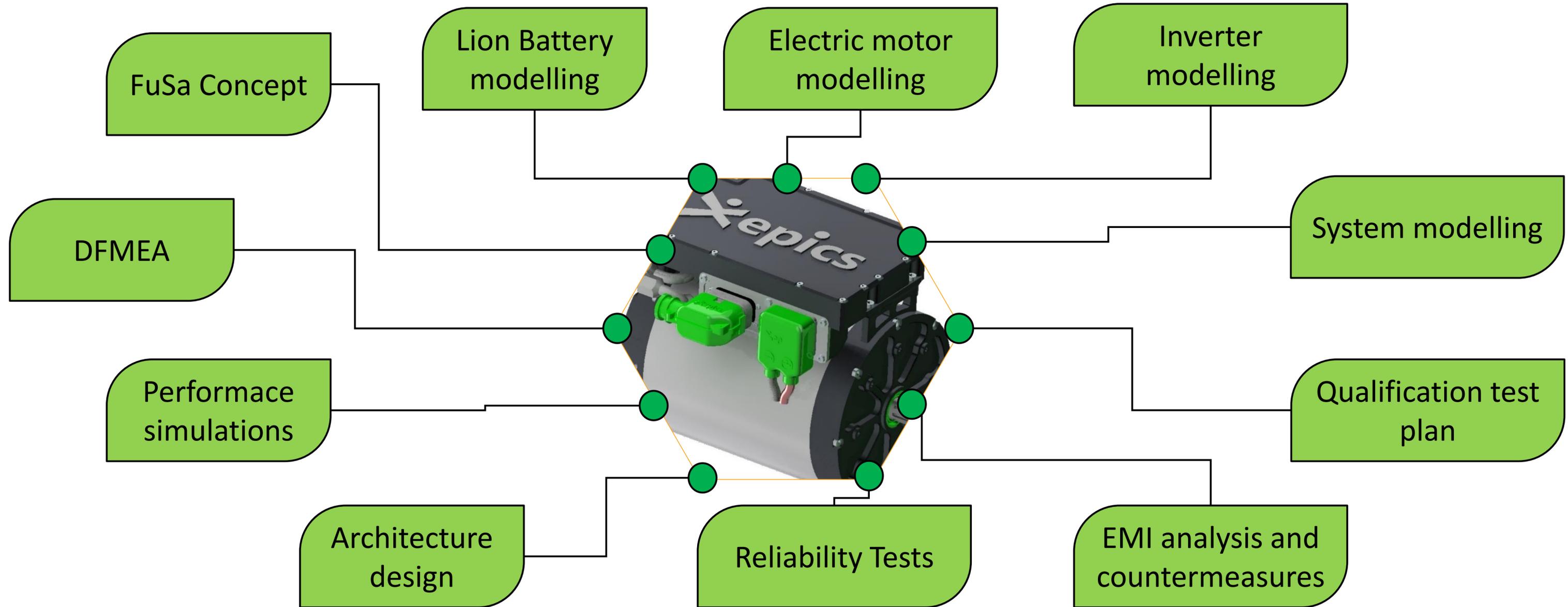


# xepics MT

Mechatronics



Xepics team has a long experience on complex mechatronics systems, with special focus on electric vehicles.



# X-Ray

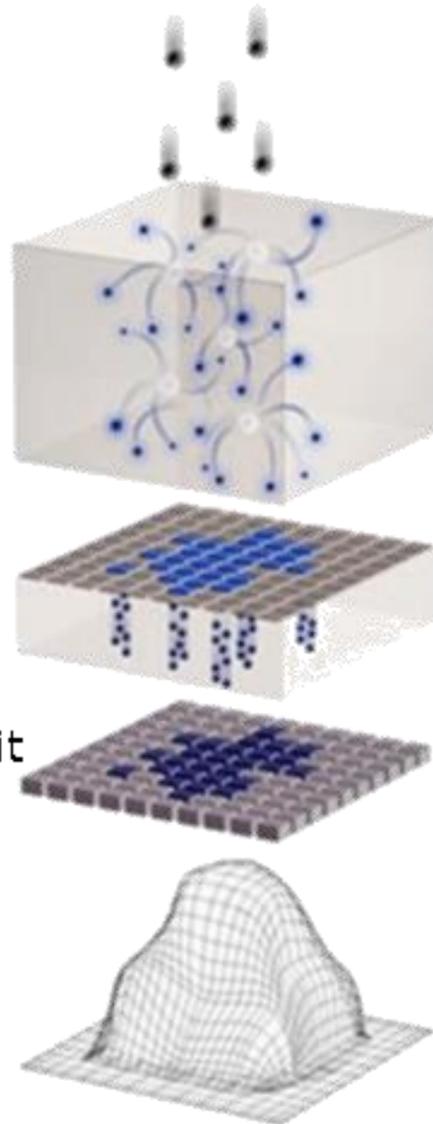
X-Ray

Scintillator

Photodiode

Electric Circuit  
(CCD, CMOS, ...)

Image



## Xepics Italia s.r.l.

Research and Development

X-Ray analysis → control quality system:

- Non-destructive controls: reduced waste of materials;
- In-line inspections: promptly implement corrective actions;
- High confidence on products quality: control on the whole production.

X-ray imaging/sensing system for industrial applications.

To study the state of the art in X-ray imaging the interaction between radiation and matter has been deepened. Within this activity, the radioprotection and security on workplace topics have been touched.

An Optical-X-Ray standalone automated machine for off-line products inspection have been designed and implemented.

# X-Ray

## Xepics Italia s.r.l.

Research and Development

Indirect X-Ray detection

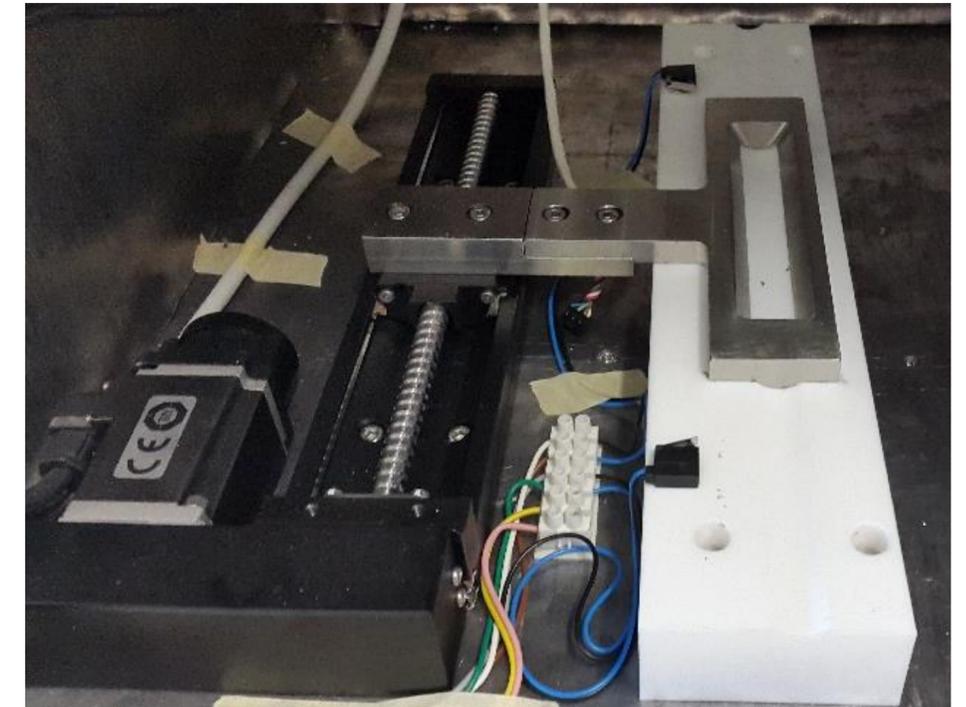
An automatic test bench has been designed and implemented to analyse the shape and the orientation of a thin Nickel foil.

X-Ray source: Hamamatsu L9181-02.

- Variable focal spot: 5-40 $\mu$ m.
- Beam aperture: 45°.
- Max. 130kV, 300 $\mu$ A, 39W.

X-Ray camera: Dalsa Xineos-2301.

- Linear CMOS camera.
- Spatial resolution: 99 $\mu$ m.
- Max. line rate: 300lps.



# X-Ray

VIS module:

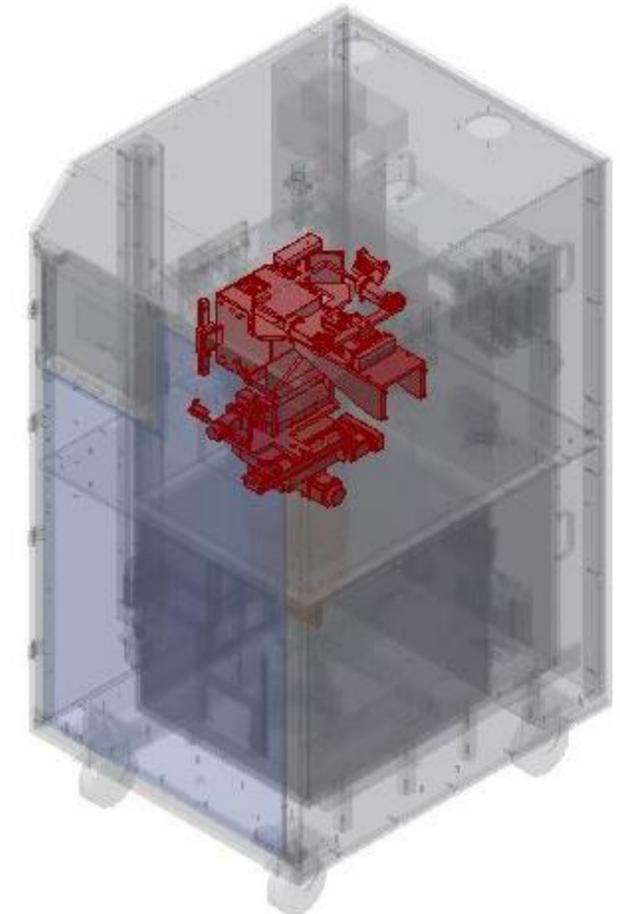
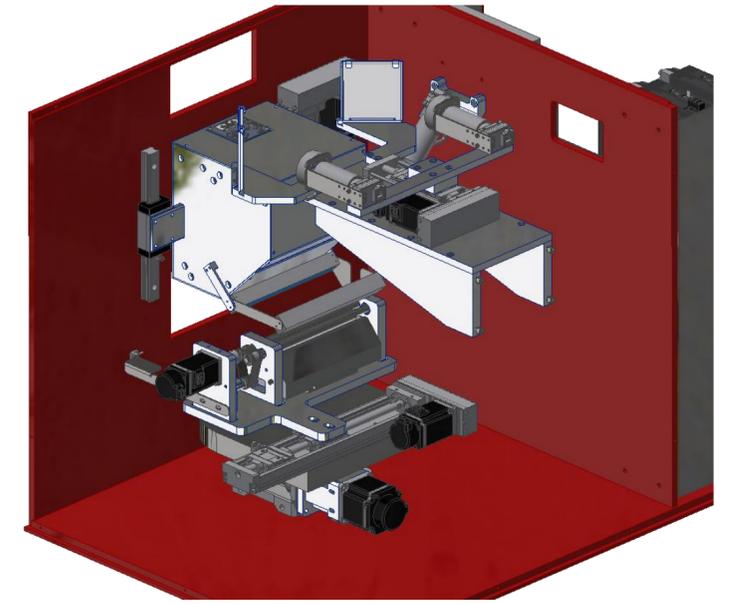
- 5 axis to realize required movements.
- 3 area cameras.
- 1 linear scan camera.
- Focal length of linear scan camera has been adjusted with a sequence of mirrors.

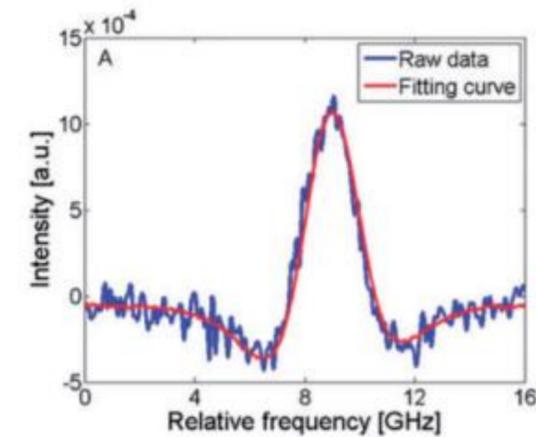
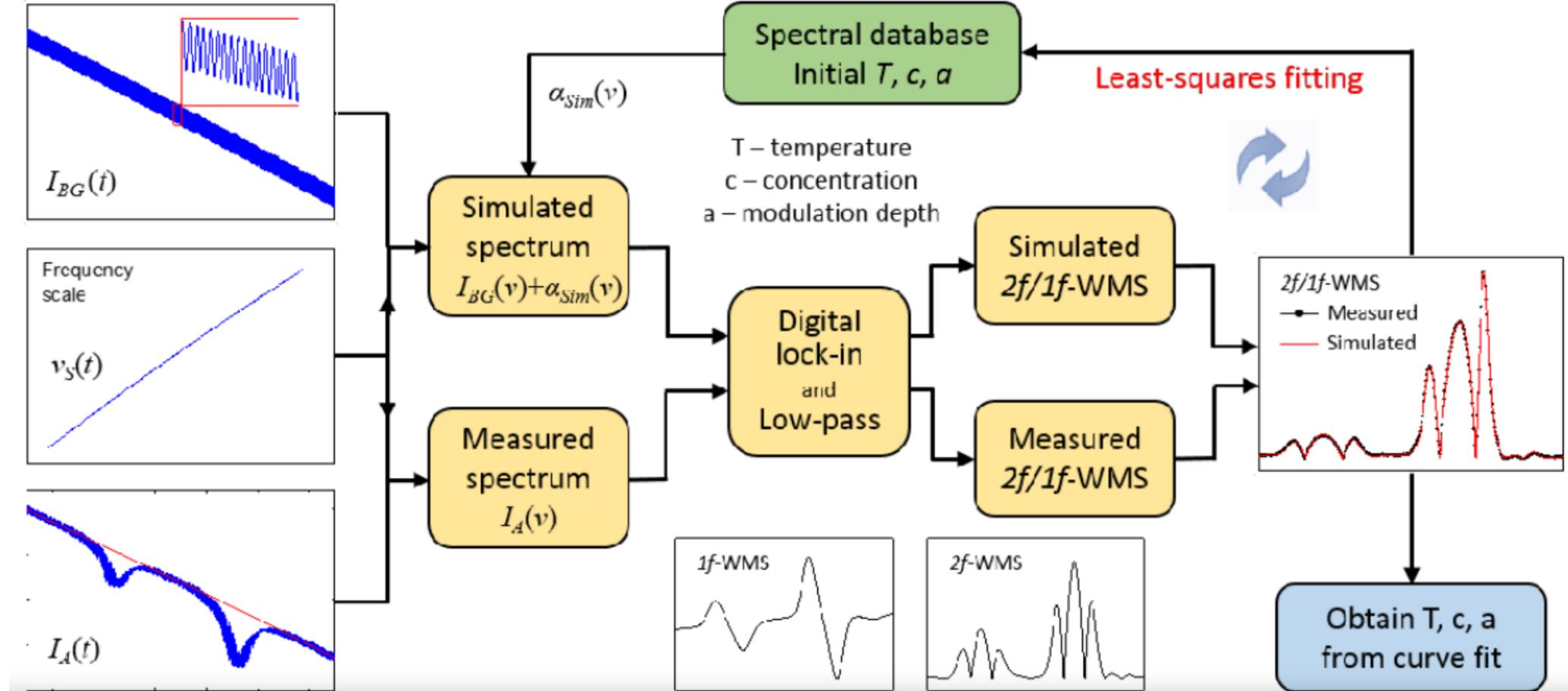
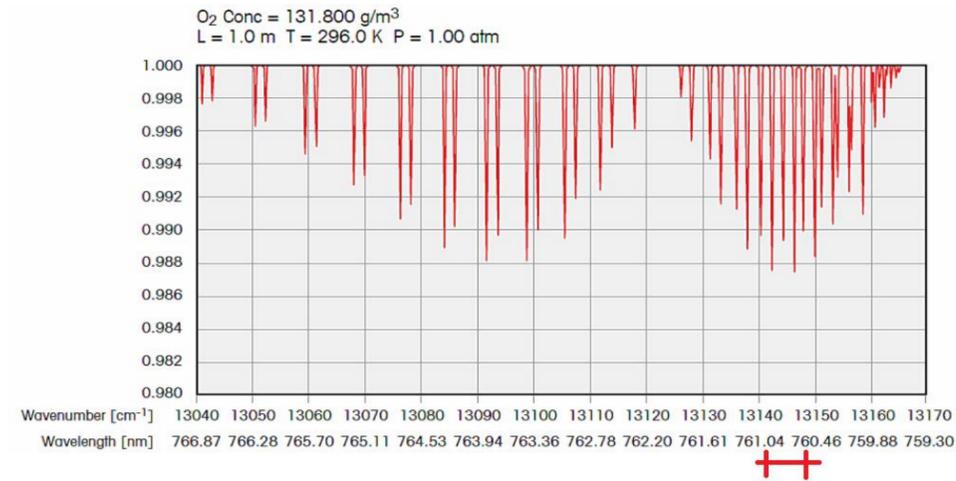
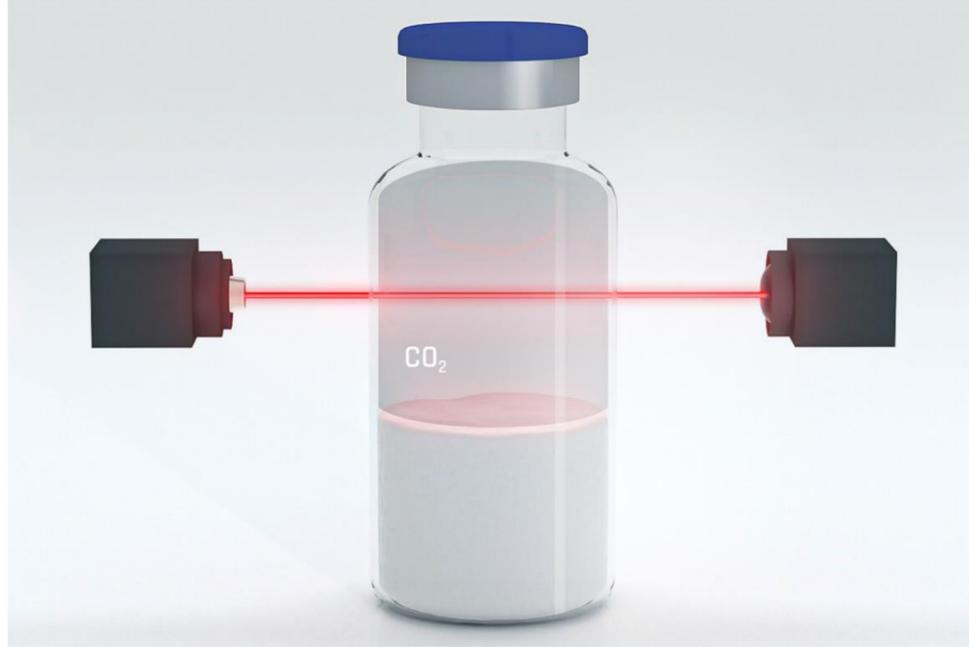
## Key Topics

- X-Ray source generator
- C-MOS sensor
- *Automation: Kinematics control*
- Functional safety

# Xepics Italia s.r.l.

Research and Development





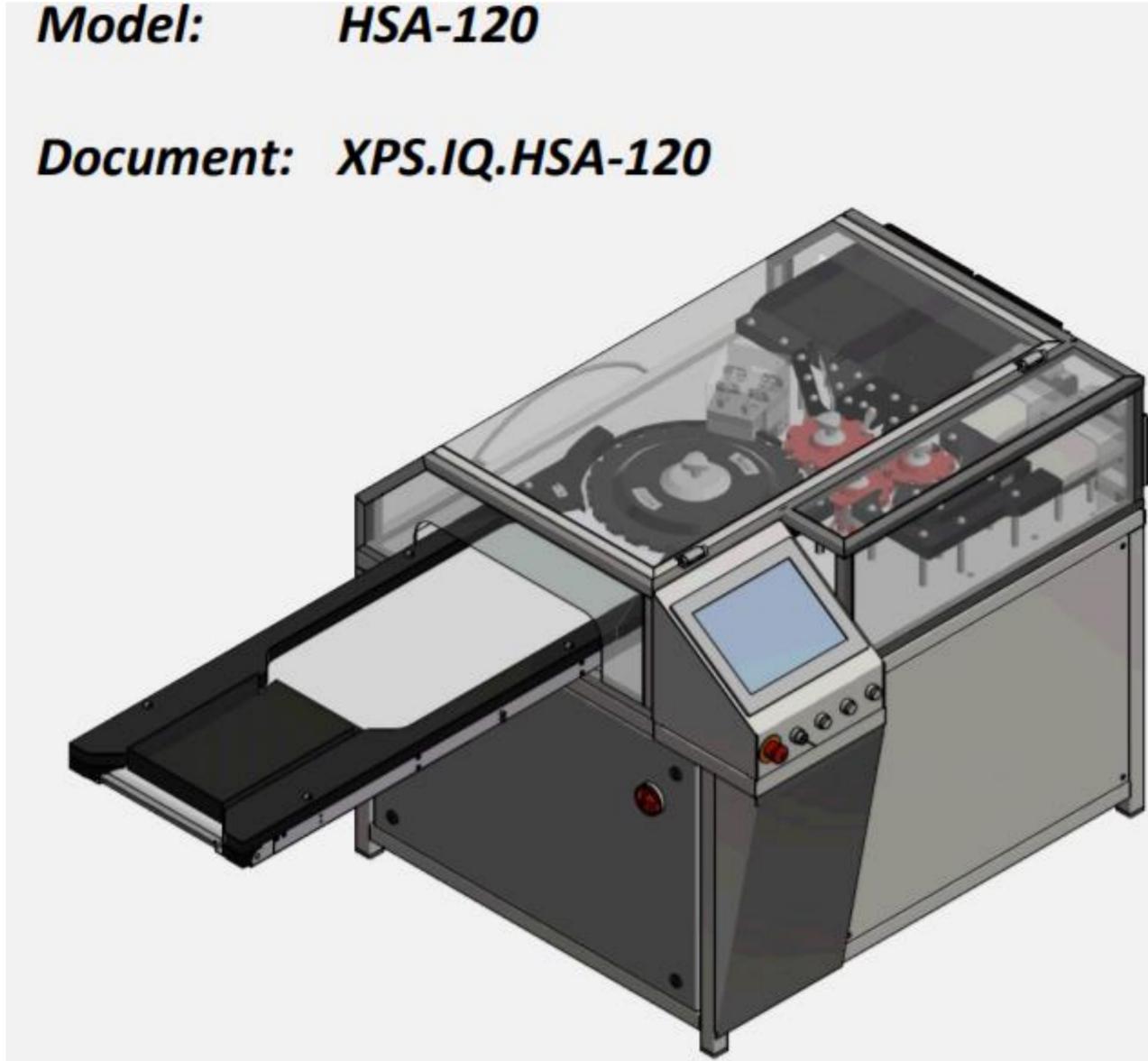
# HSA

# Xepics Italia s.r.l.

Research and Development

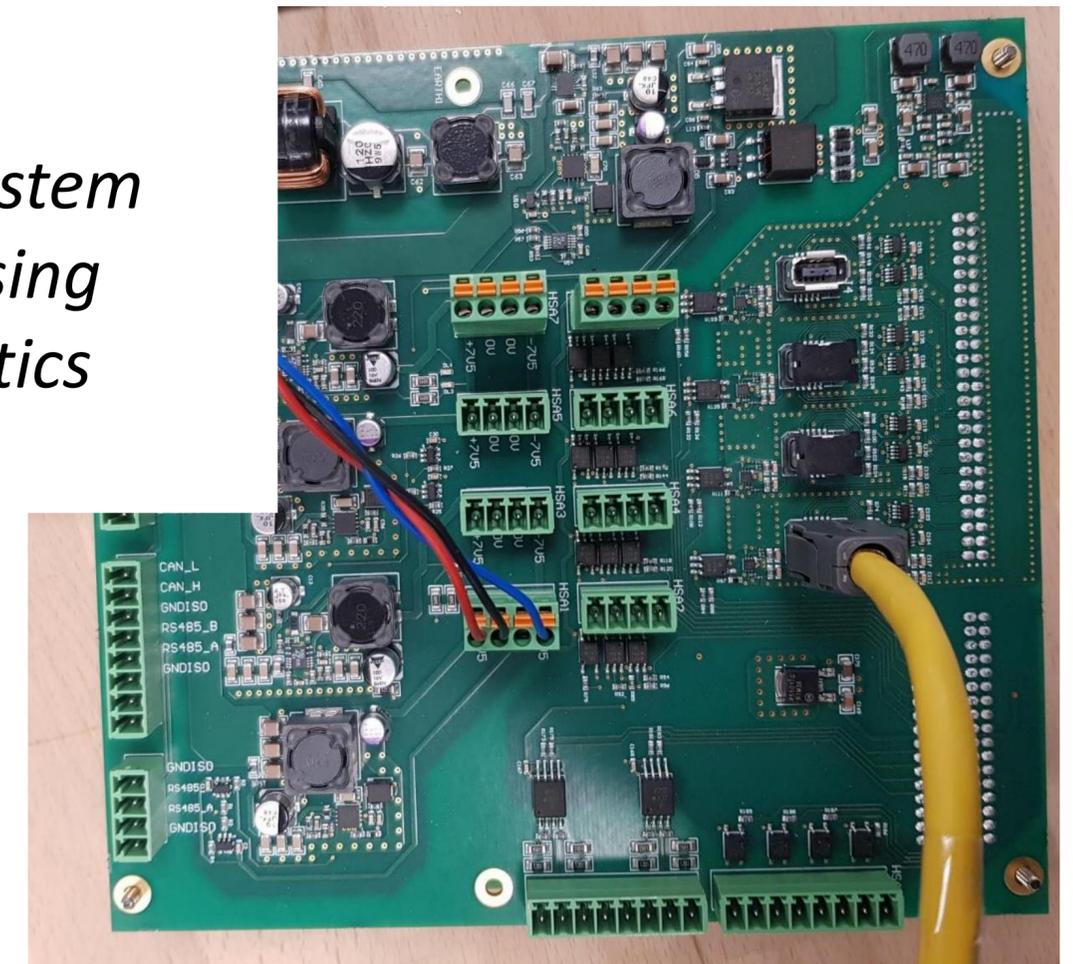
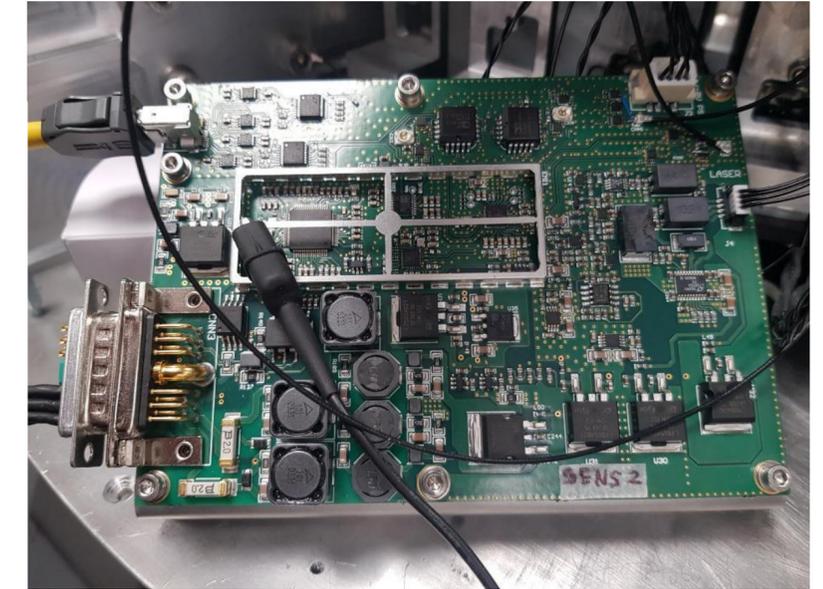
**Model:** HSA-120

**Document:** XPS.IQ.HSA-120



## Key Topics

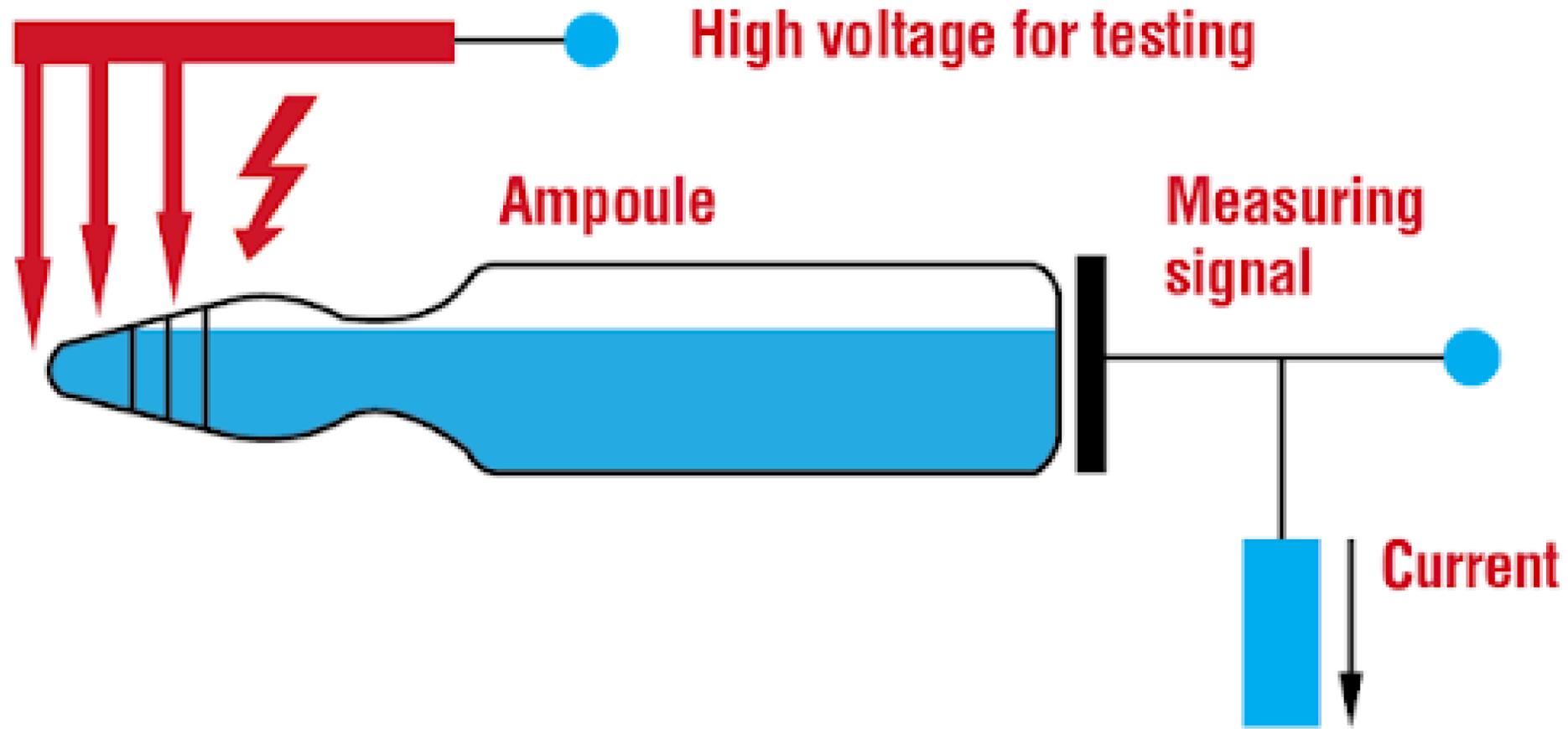
- *Digital signal synthesizer*
- *VCSEL Laser Driver*
- *TEC controller*
- *Direct conversion demodulator*
- *Digital Acquisition System*
- *Digital Signal Processing*
- *Automation: Kinematics control*



**HVLD**

# Xepics Italia s.r.l.

Research and Development



## Key Topics

HV pulse generator (up to 60kV)

Digital Acquisition System

Digital signal Processing

Functional safety



# V2X

# Xepics Italia s.r.l.

Research and Development



## *Key Topics*

Ultra-high density AC/DC bidirectional power conversion

PLC communication

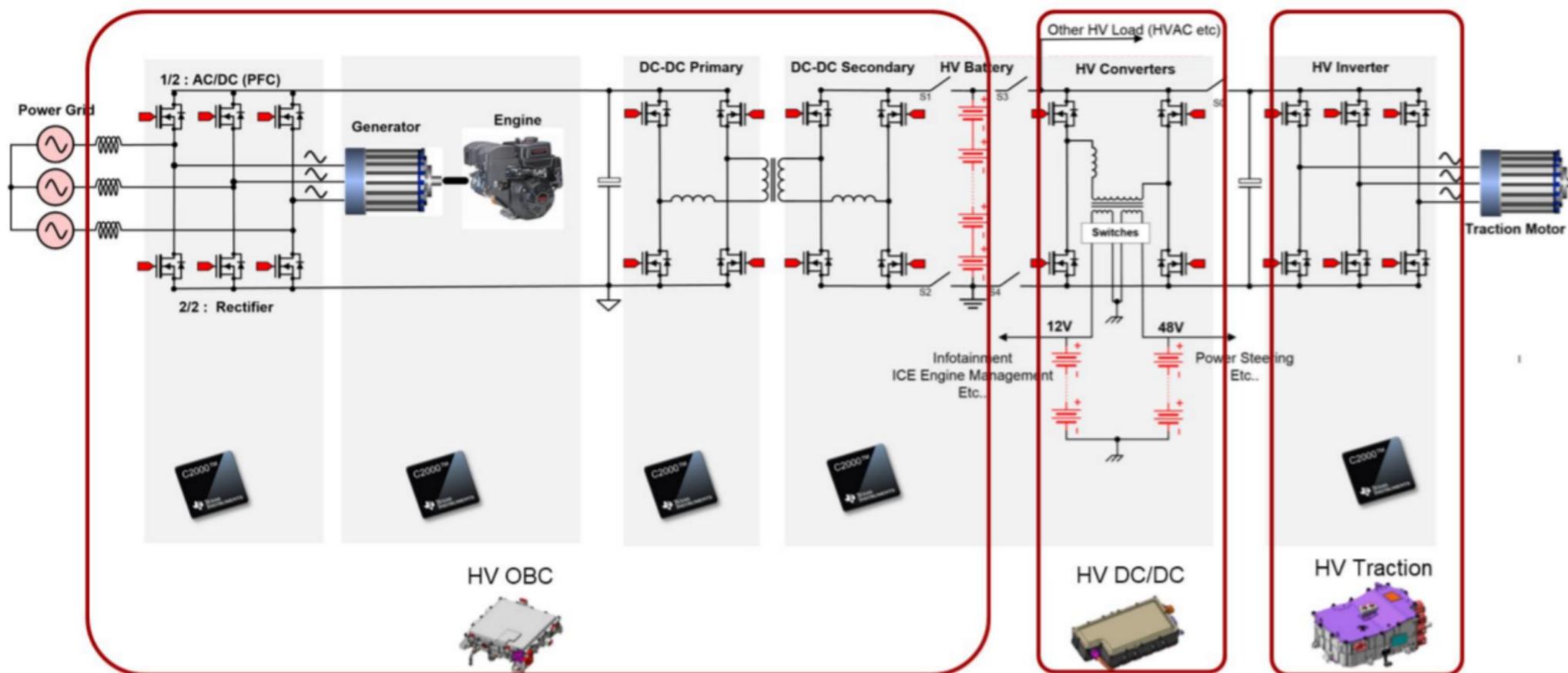
High switching frequency (challenges)

- Magnetics design
- Gate Driving
- SiC
- Thermal Management
- Digital Control



## DRIVING INTEGRATION

### EV sub-systems



One mechanical enclosure:



>50% reduction in size/weight  
- longer range per charge (up to 15%)

### Key Topics

- High Speed Motor Drive
- High Speed Reluctance-Assisted permanent magnet motor
- High Power density (High Switching Frequency)
- SiC (Gate Driving)
- Thermal management
- Functiona Safety
- Topology: choice and optimization
- Digital Control (Algorithms)



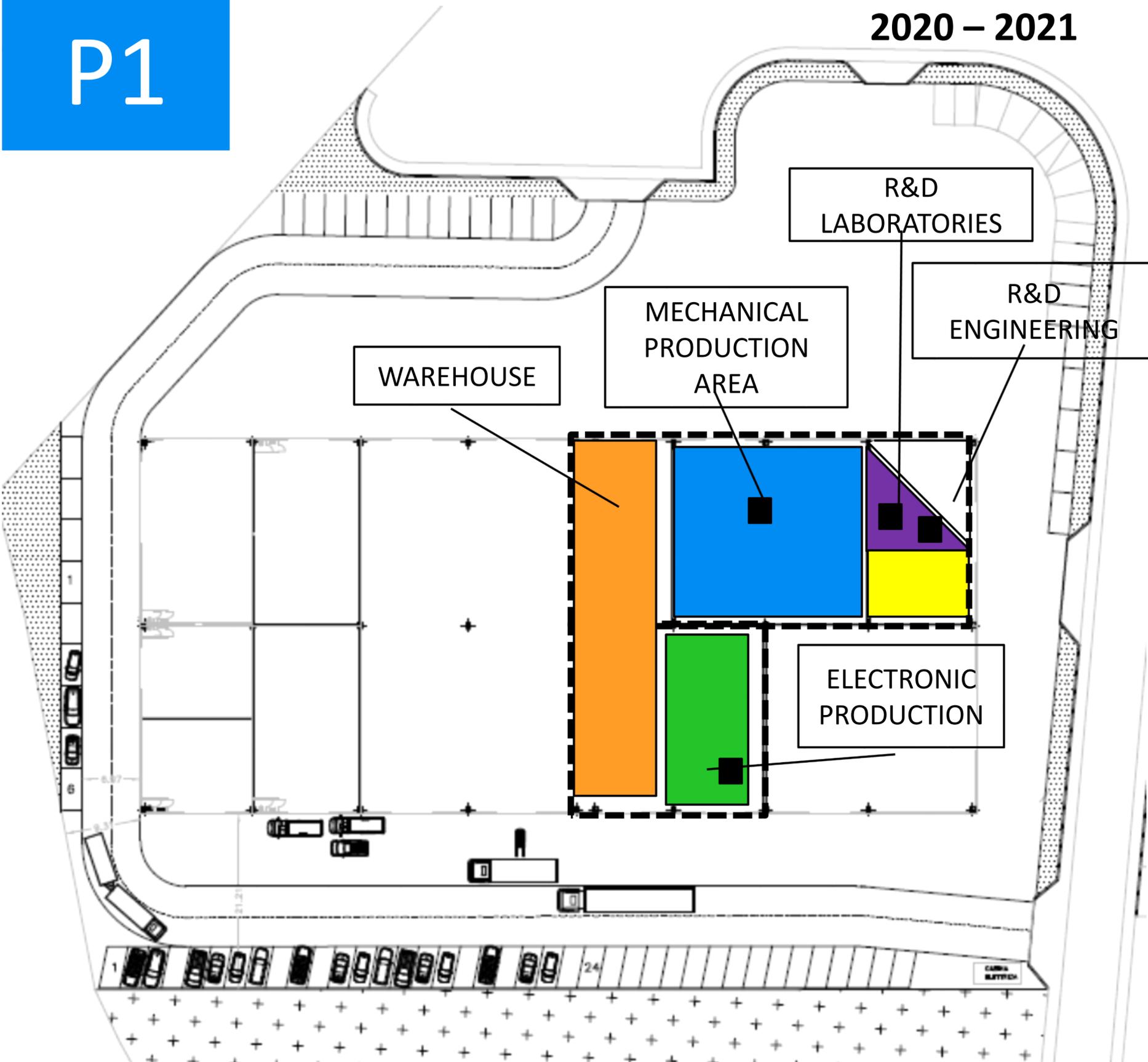
# Xepics Italia s.r.l.

## Key Characteristics

- Focused on innovation
- Holistic and Multidisciplinary approach
- Open to discussion and collaboration
- Strong and positive leadership
- Inspire a positive company culture
- Provides assessment and feedback
- Believes on young talents

P1

# PLANT AREAS USE 2020 – 2021



Totale available surface: 6000 m<sup>2</sup>

**Offices & Common areas : 450 m<sup>2</sup>**

**R&D + Pre-series production : 750 m<sup>2</sup>**

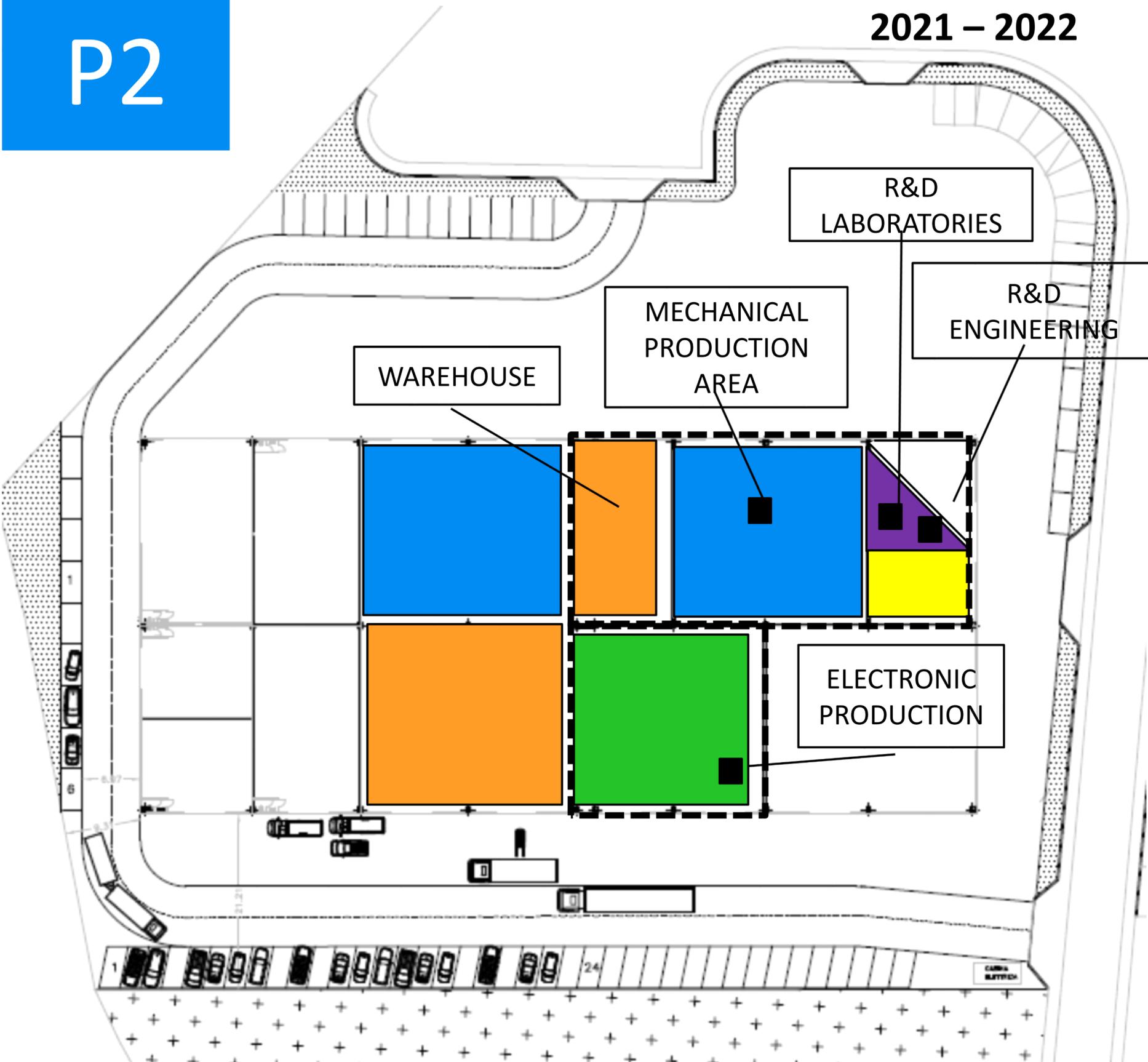
- Plant offices (2° floor): 300 m<sup>2</sup>
- Electronic R&D Labs : 200 m<sup>2</sup>
- Common areas: 150 m<sup>2</sup>
- Mechanical Prod. Plant (550 m<sup>2</sup>)

**Capacity:**  
1X PILOT LINE 1000 PCS/YR



P2

# PLANT AREAS USE 2021 – 2022



Totale available surface: 6000 m2

**Offices & Common areas : 450 m2**

**R&D + Pre-series production : 750 m2**

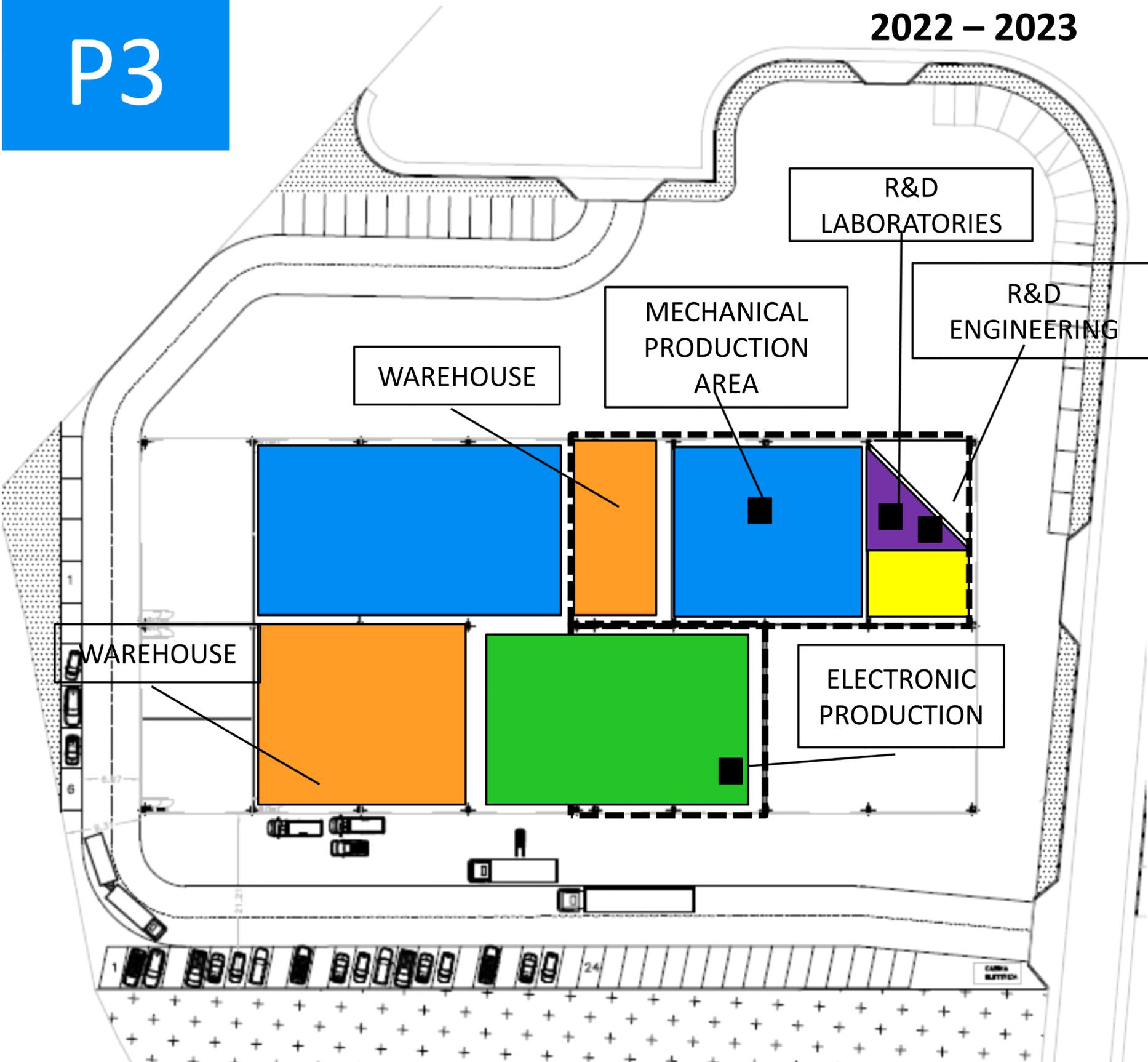
- Plant offices (2° floor): 300 m2
- Electronic R&D Labs : 200 m2
- Common areas: 150 m2
- Mechanical Prod. Plant (550 m2)

**Capacity:**  
1X PRODUCTION LINE 5000 PCS/YR



P3

# PLANT AREAS USE 2022 – 2023



Totale available surface: 6000 m<sup>2</sup>

**Offices & Common areas : 450 m<sup>2</sup>**

**R&D + Pre-series production : 750 m<sup>2</sup>**

- Plant offices (2° floor): 300 m<sup>2</sup>
- Electronic R&D Labs : 200 m<sup>2</sup>
- Common areas: 150 m<sup>2</sup>
- Mechanical Prod. Plant (550 m<sup>2</sup>)

**Capacity:**  
2X PRODUCTION LINES  
12000 PCS/YEAR

# Get in Touch



Lavora con noi: [hr@xepics.com](mailto:hr@xepics.com)



## Xepics IM

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