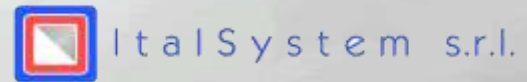


ITALSYSTEM



www.italystemsrl.it

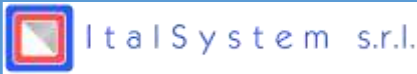
COMPANY PROFILE

- ItaSystem s.r.l. was founded in 1996 and operates in the Information Technologies and Engineering sector, particularly in the areas of Avionic software, Telecommunications and consulting.
- ItaSystem s.r.l. collaborates with some of the major aeronautical companies and is qualified supplier of Leonardo SPA, ATR, Thales Alenia Space spa, ESA (European Space Agency) and CIRA (Italian aerospace research centre).
- The Company is certificated ISO 9100:2016 and operates in conformity with the RTCA and EUROCAE standards (DO178C, DO160, DO254, MIL-STD-498, etc.).
- The company is involved both in civil and military projects devoted to avionic systems (aerospace, aeronautic and defense).



COMPANY PROFILE

EXPERTISE



Embedded System

- SW Development
- HW Development
- V&V according DO-178C
- Model Based Design

Graphic Simulator

- 3D Graphic
- Modelling
- Computer Based Training
- Virtual Maintenance Training

Consulting

- ERP System
- Logistic Engineering
- On field Operative support (MPDS & GBTS System)
- Maintenance Plan Definition
- Technical Publication (S1000D)

R&D

- Hybrid Propulsion
- Display Systems
- Electromechanical Actuation
- Health Monitoring Systems
- Advanced Control System

Embedded Systems and R&D projects are carried out in our facility in Avellino

Main Aerospace Programs



Main Programs



Plant Cascina C.



- Aircraft & Mission Management System **AW189, AW169, AW249**
- Cockpit Display System **AW189, AW169, AW101, AW249**
- Enhanced Display Control Unit **AW169**
- **AW249**: AMMC, LAD, EDCU SW Design, Development, Testing (**DAL A**)
- **FCS - Next Gen Tilt Rotor**: Flight Control System SW development (**DAL A**) according with **DO331**
- Smart PArallel Rotative aCtuator (**SPARC**): Design, development and validation of Application SW (**DAL A**) of control **ECU**
- **PROTEUS (Unmanned)** : **FCS** SW Development and test according **DO331**



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Plant Torino

Main Programs

- Flight Control Computer M346
- Mission Computer C27J
- Mission Computer NEURON
- Vehicle Management System Sky Y
- Technical Publications
- Logistic Engineering for Eurofighter



Plant Decimomannu (CA)

- Support activity for AMI (Scheduler)
- Support activity for Aircrew Training

Plant Galatina

- Support activity for AMI
- MPDS & GBTS System Support

Plant Venegono

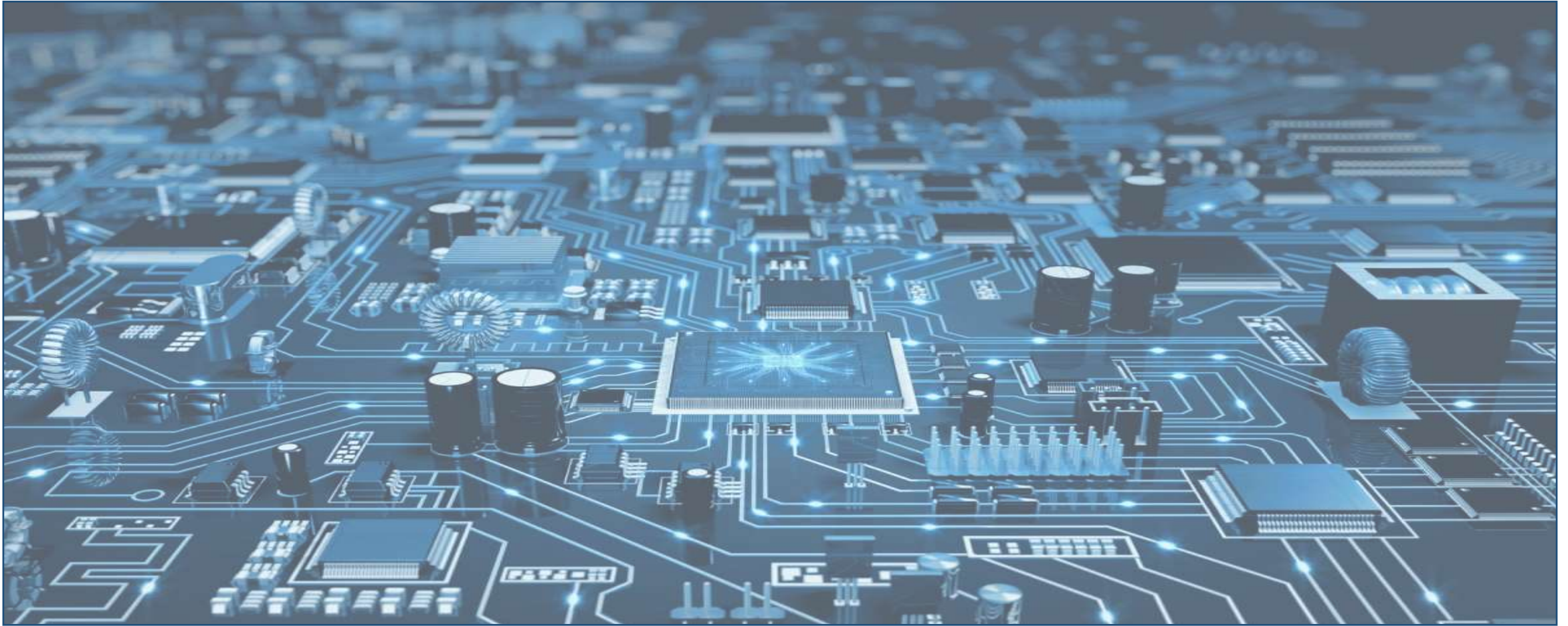
- Mission Computer M346
- Flight Control System M346
- Health and Usage Management System M346
- Training system for M345 and M346
- Logistic Parameters Analysis for M345 and M346 Programs



Plant Pomigliano

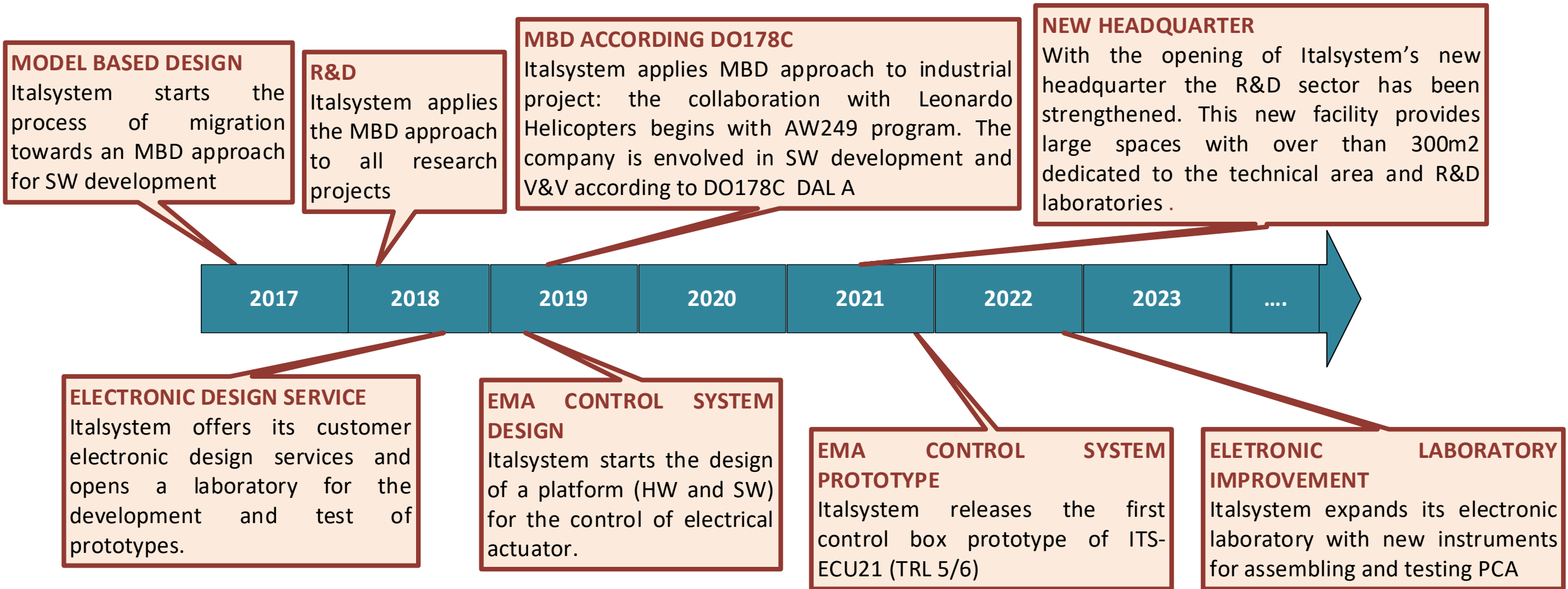
- Attività di aggiornamento e Testing - ROAF
- Spare Qualification & In Service LCC Analysis
- SAP ERP System Implementation

Embedded Systems



Key Capabilities

Embedded system and MBD

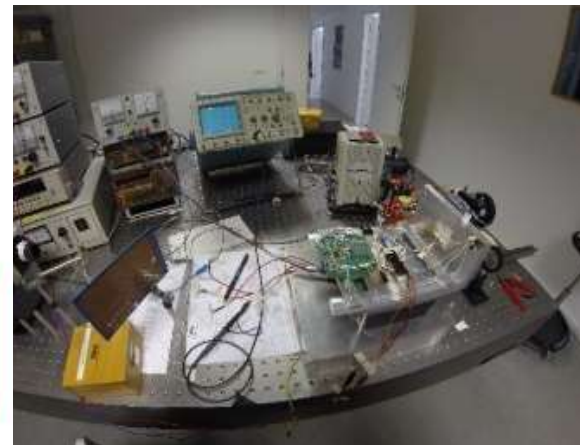
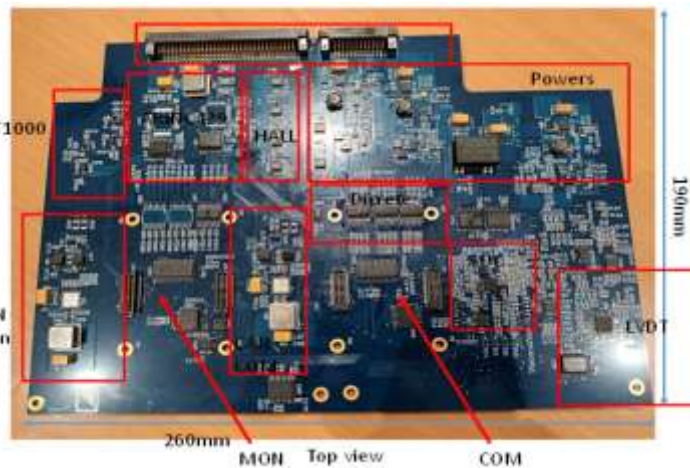
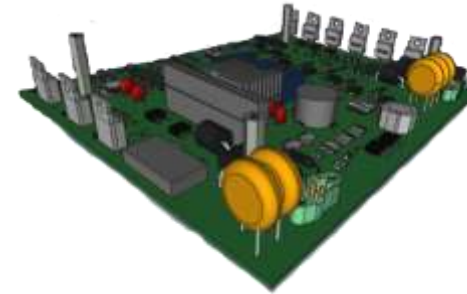


Key Capabilities

Electronic Design and Development

The Company can perform all phases of electronic design up to prototype development:

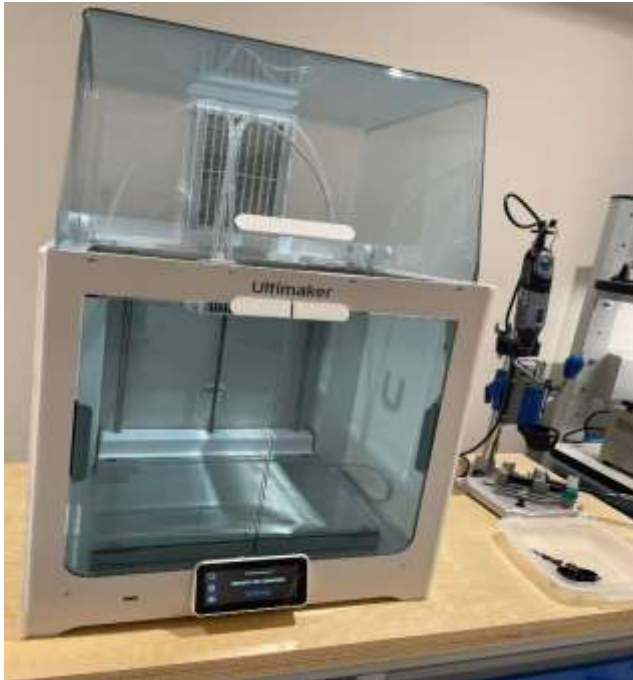
- Analogue and digital hardware design (ORCAD, ALTIUM) and Circuit simulation.
- Development of custom electronic cards
- Integration of electrical and electronic systems:
- Development of EGSE - Electrical Ground support equipment



Key Capabilities

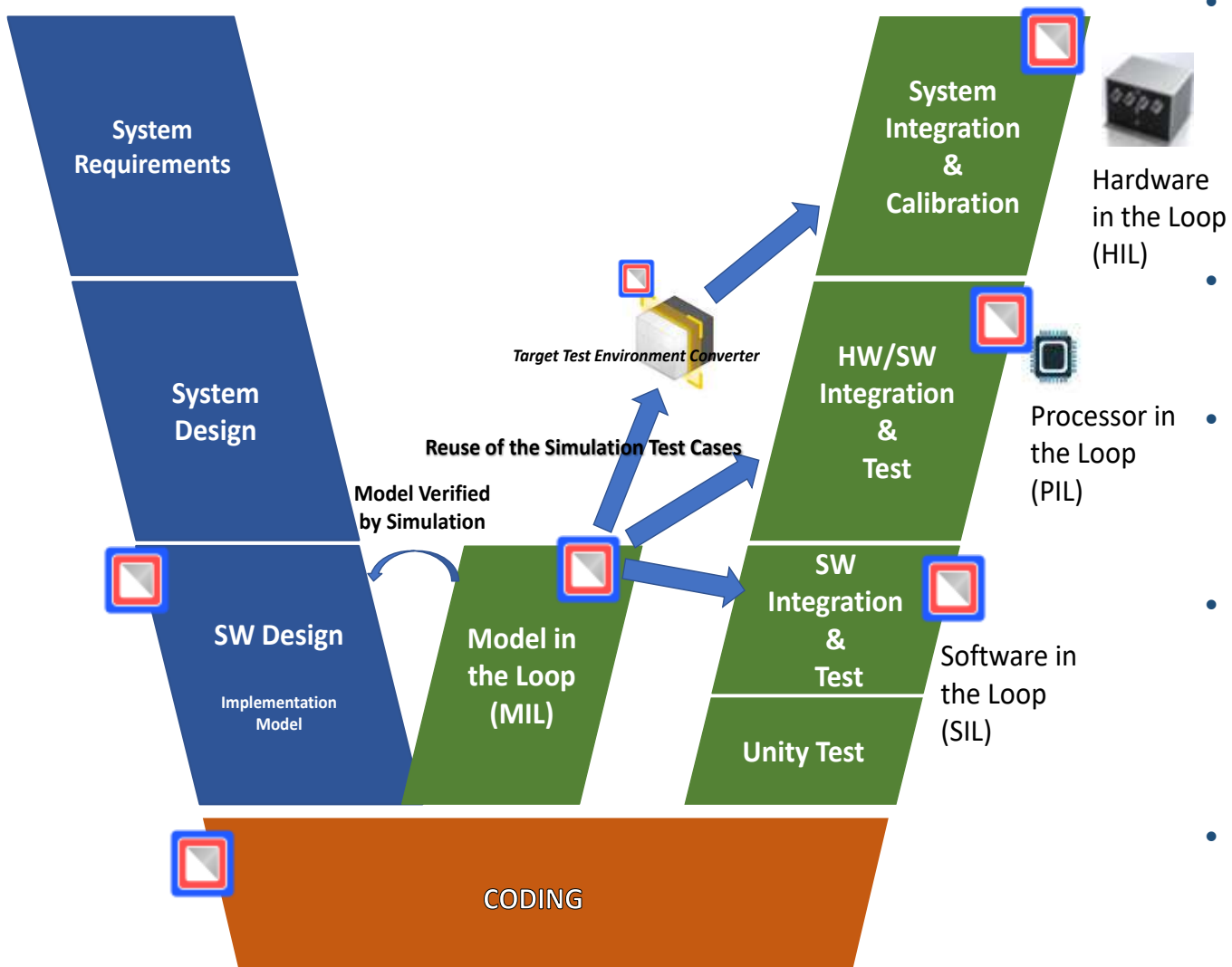
Electronic Design and Development

- Integration of monitoring and control systems (HW and SW)
- Development of HW prototype.
- Real-time system development (DSP, Zynq Xilinx FPGA, SOC and microcontroller technologies)
- VHDL language and FPGA.



Key Capabilities

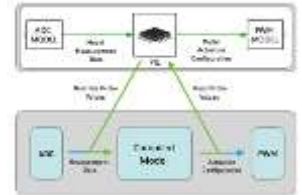
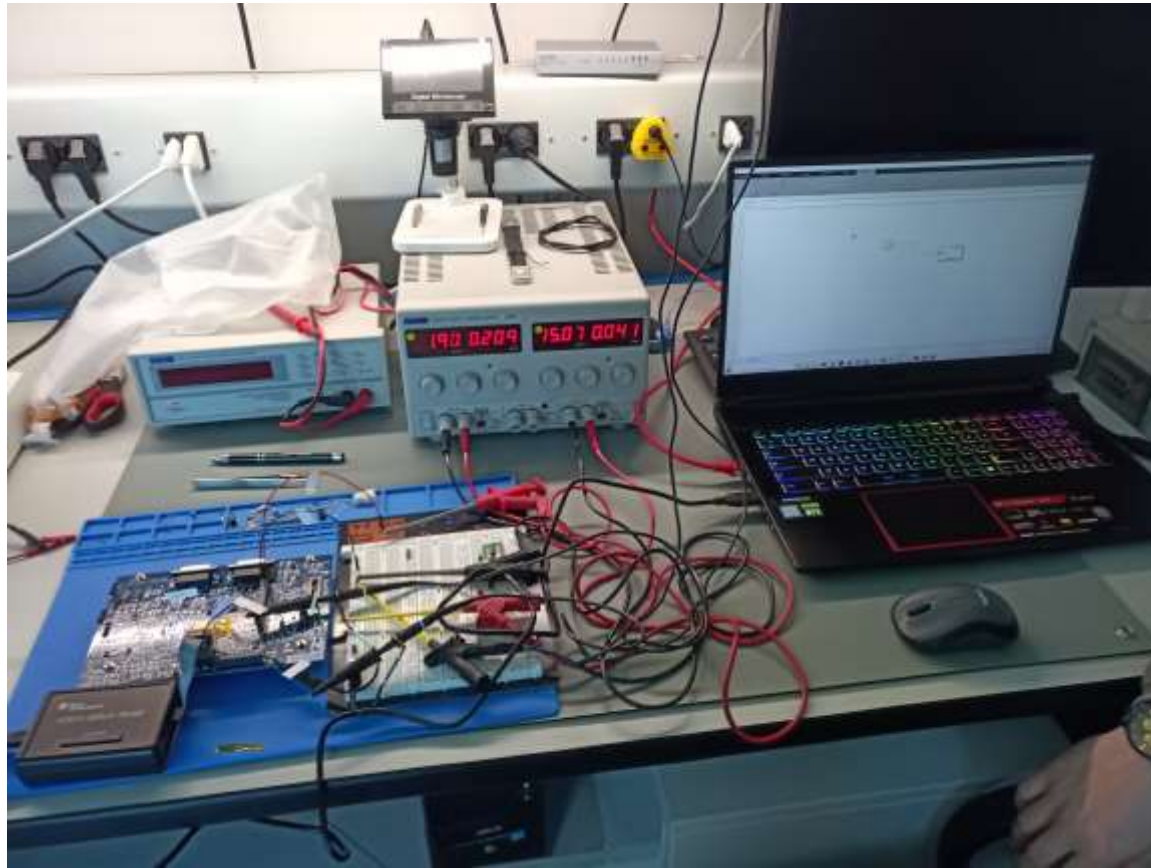
Embedded SW Development iaw MBD



- One major benefit of model-based development is the possibility to “do things as early as possible”. In terms of testing this means to test the functionality in the model before the software is implemented and integrated into the final ECU.
- The same test cases can be used for different test level in Matlab environment.
- Italsystem is able to support his customer in several SW lifecycle phases. These activities are performed at the company facility.
- Italsystem is able to develop custom application to convert simulation test cases for several HIL test environment and can support customer for test execution on site.
- Italsystem is also able to perform VoV activities (both with MBD and traditional approach).

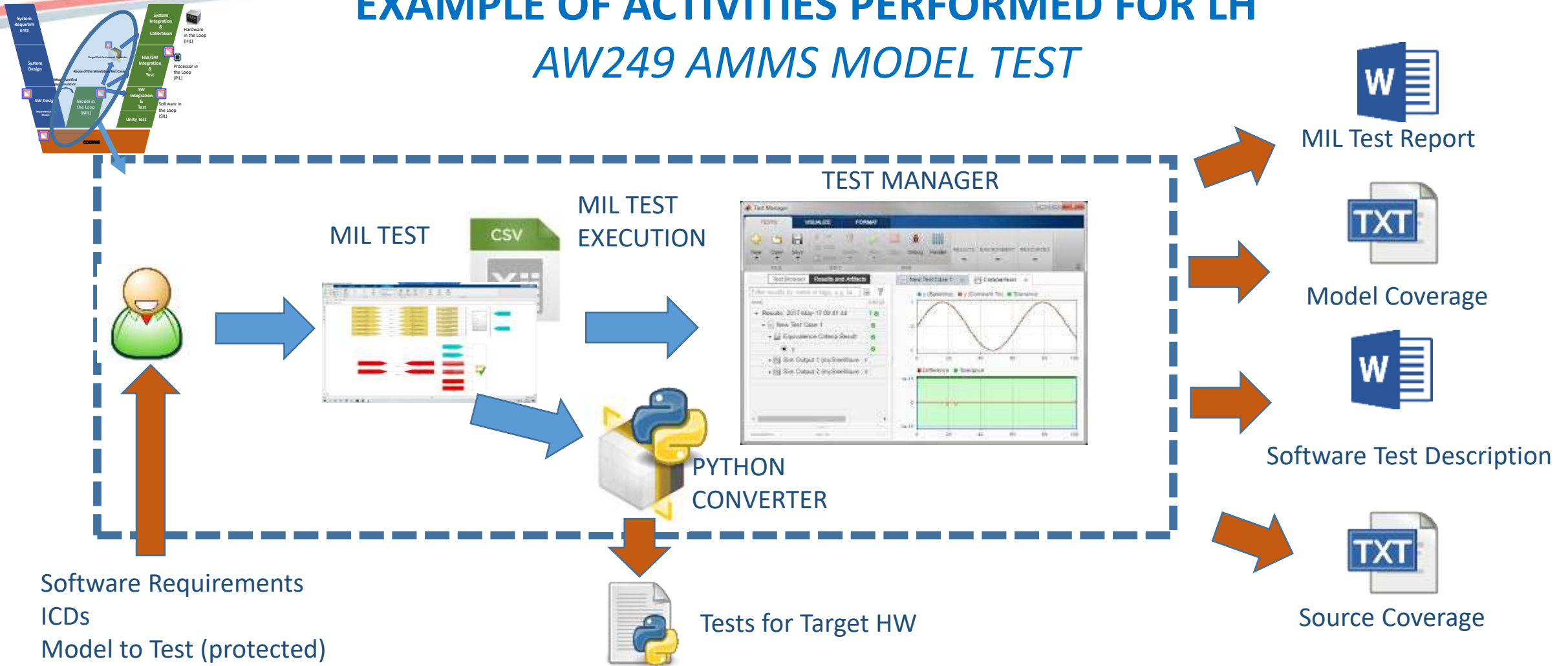
Key Capabilities

Embedded SW Development iaw MBD



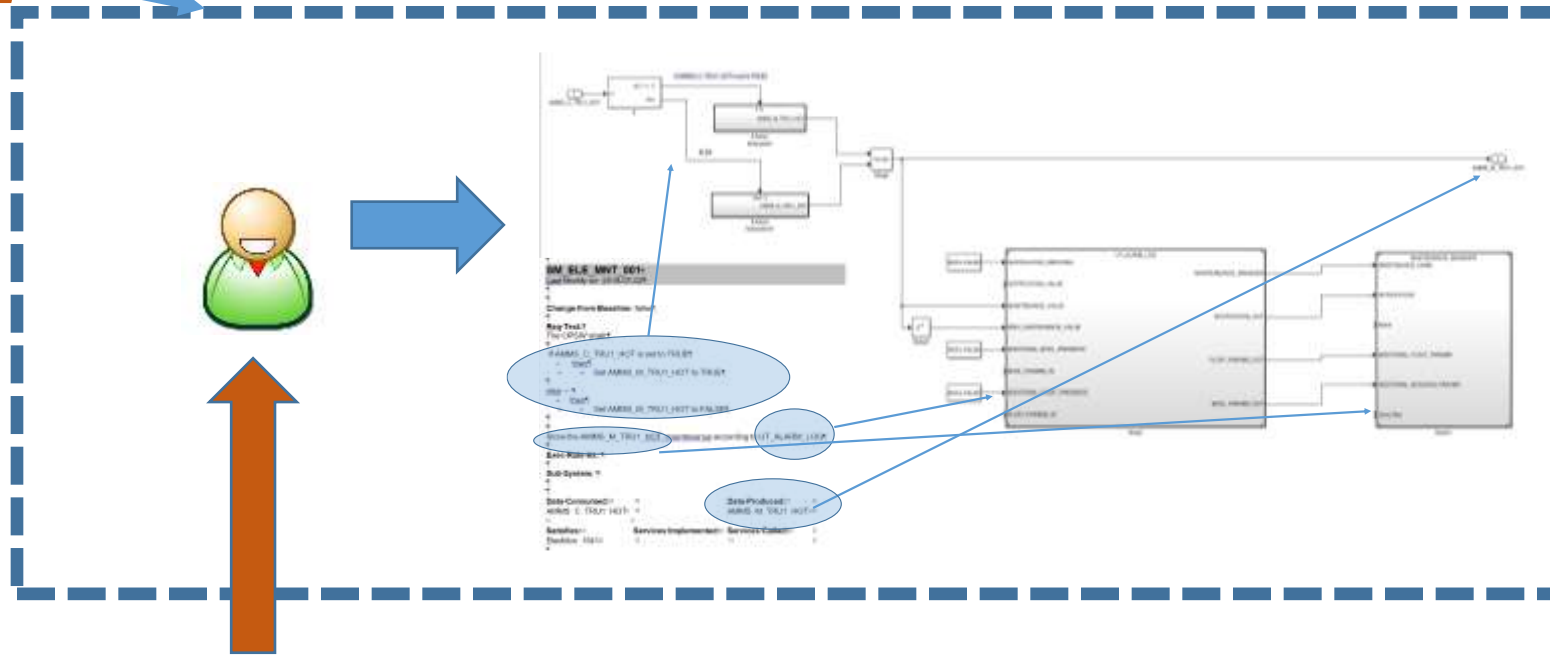
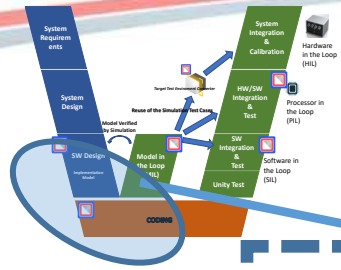
Italsystem is able to design and produce custom HW and integrate it in a MBD SW development process.

EXAMPLE OF ACTIVITIES PERFORMED FOR LH AW249 AMMS MODEL TEST



- Converter from MIL to HIL tests was developed in parallel as support tool during activities execution (no extra effort).
- Coverage problems are preliminary identified on model during test definition and then verified on source code.
- Test for Target HW correctness is verified in a Virtual environment provided by LH (VTE)

EXAMPLE OF ACTIVITIES PERFORMED FOR LH AW249 AMMS MAINTENANCE MODEL DEVELOPMENT



Software Requirements

Design Model Files

Source Code Report

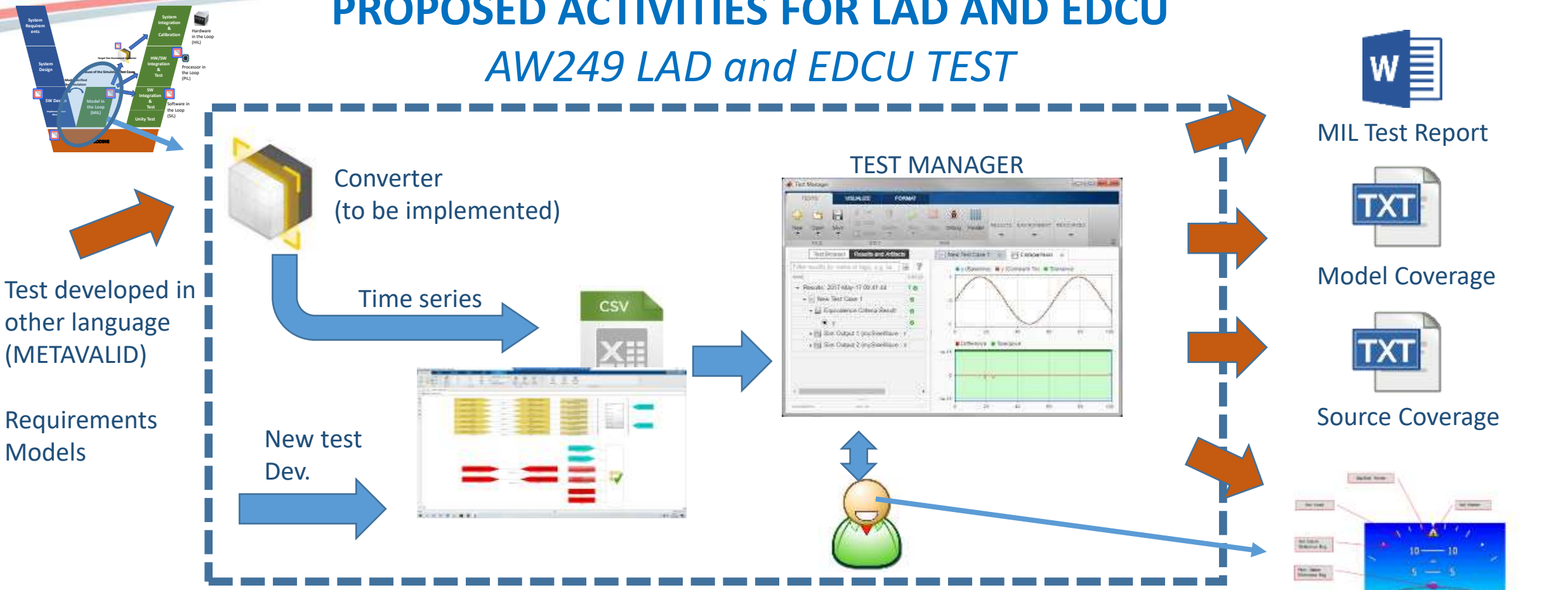
Support Dev. Documents

- Delivered Models are verified by means of Simulink Model Check Tool.
- Source Code is generated from model before to deliver it, to verify auto-coding error absence.
- Development Process is supported by means of custom tools, developed to reduce implementation error (automatizing repetitive actions).



PROPOSED ACTIVITIES FOR LAD AND EDCU

AW249 LAD and EDCU TEST



Test developed in other language (METAVALID)

Requirements Models

Converter (to be implemented)

Time series

New test Dev.

TEST MANAGER

MIL Test Report

Model Coverage

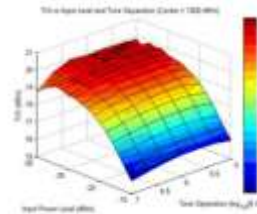
Source Coverage

Connection with external system

- Already developed tests can be reused translating them in time series
- New test in METAVALID can be verified by means of model before running on target (**virtual dry-run**)
- Other tests can be developed directly in csv (for example to have a better model coverage)
- Converter from METAVALID can be developed in parallel as support tool during activities execution (no extra effort). See the case of python converter for AMMS.

TOOL

- Simulink, Simulink Test, Simulink Check and Simulink Coverage for Qualified Model Verification
- Embedded Coder and Simulink Code Inspector for Code Automatic Code review
- Simulink Design Verifier and Simulink Coverage for Qualified Test Generation
- Simulink Test for Qualified Software Testing
- Simulink Coverage for Qualified Code Coverage Analysis
- Simulink Requirements and Simulink Report Generator for Traceability and Documentation
- DO Qualification Kit for Tool Qualification
- Polyspace Bug Finder for code static analysis
- Lauterbach TRACE 32: Assembly coverage



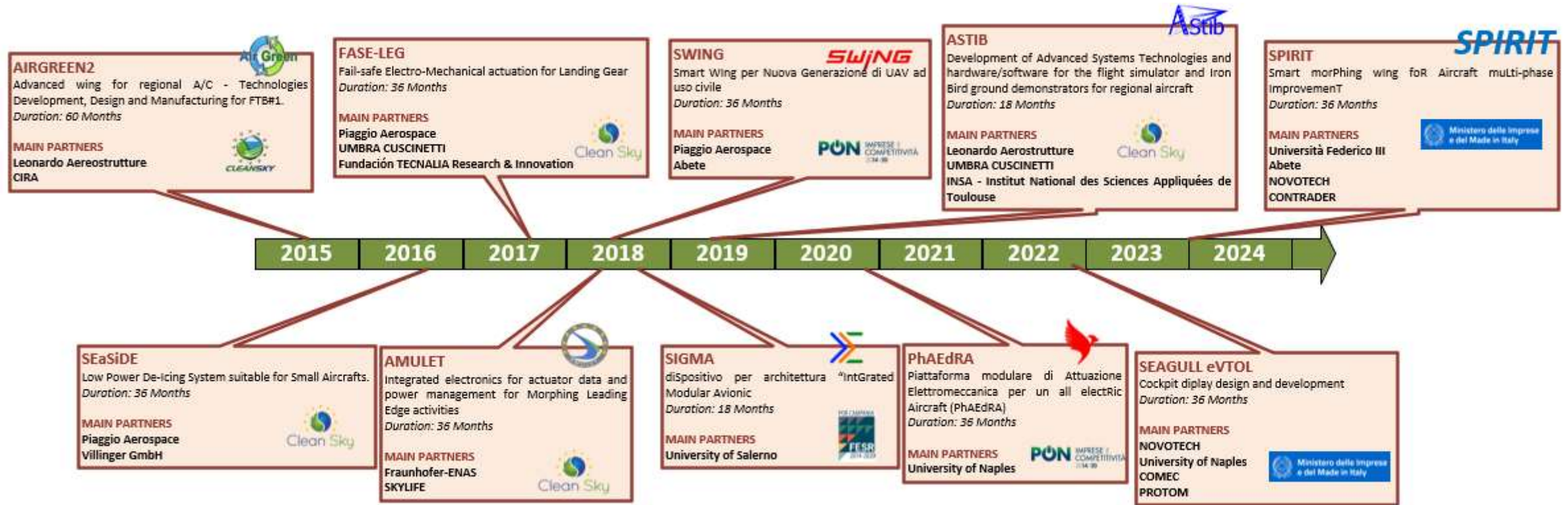
MATLAB
SIMULINK

Research & Development



Research & Development

EMA CONTROL



Since 2017 the company is involved in a research line dedicated to the control of electromechanical actuators in the aeronautical field, specializing in control, HW & SW development.

Research & Development

Partners



UNISA
Mathematics and Computer Science
Department



Thales Alenia Space



ESA
The European Space
Agency



UNINA
Aerospace Engineering Department



Villinger R&D



ONERA



POLITO
Department of Mechanical and
Aerospace Engineering (DIMEAS)



Piaggio Airspace



Fraunhofer ENAS



UNIPI
Department of Mechanical and
Aerospace Engineering



Hellenic Aerospace Industry



CIRA S.C.p.A.
*Italian Aerospace
Research Center*



Politecnico Milano



GKN



DAC S.c.a.r.l.
The Aerospace Technological
District of Campania



Clean Sky



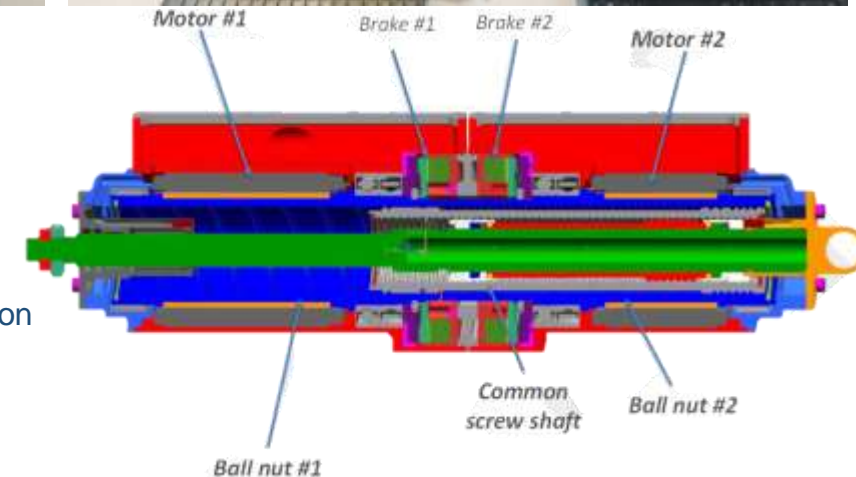
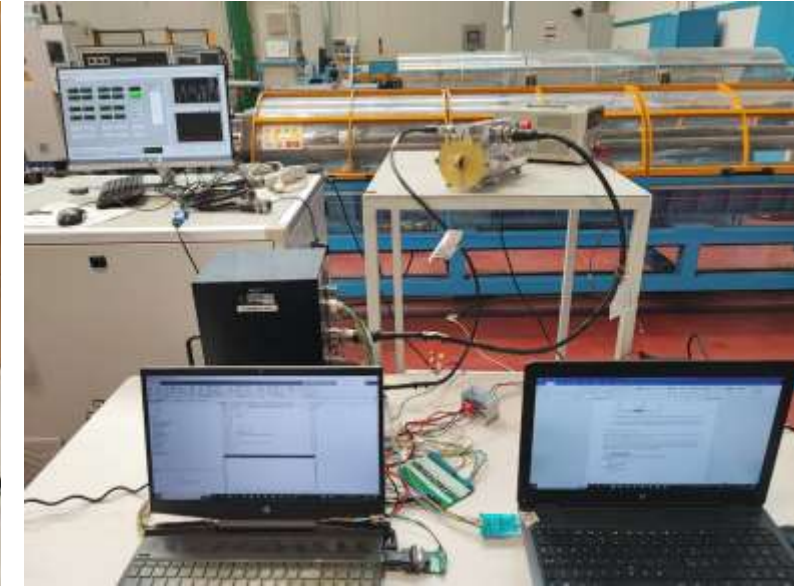
Campaniaerospace



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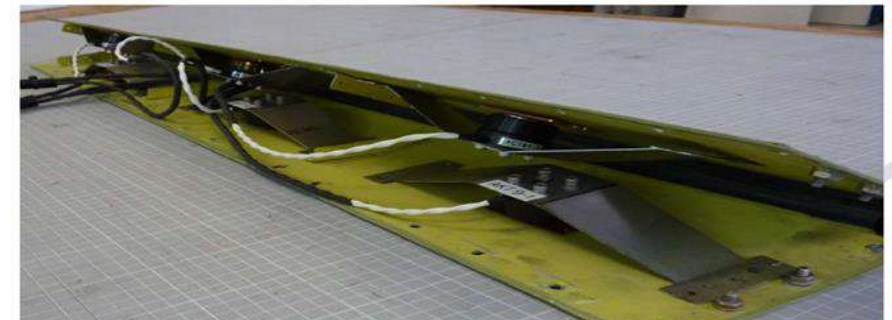
- Main Goal: Development of an innovative fail-safe Electromechanical Actuation System For Landing Gear (MLGs and NLG)
- Actuator is composed by two independent motor and can work in different configuration to reduce jamming risk.
- Application to P180 (topic manager Piaggio Aerospace)
- Italsystem was in charge of control design and SW development (with MBD approach)
- Final TRL 5 (test on IRON BIRD)



Partners :

- Umbra Cuscinetti S.p.A.
- Magnaghi Aeronautica S.p.A.
- Italsystem s.r.l.
- VGA s.r.l.
- Fundacion Tecnalia Research & Innovation

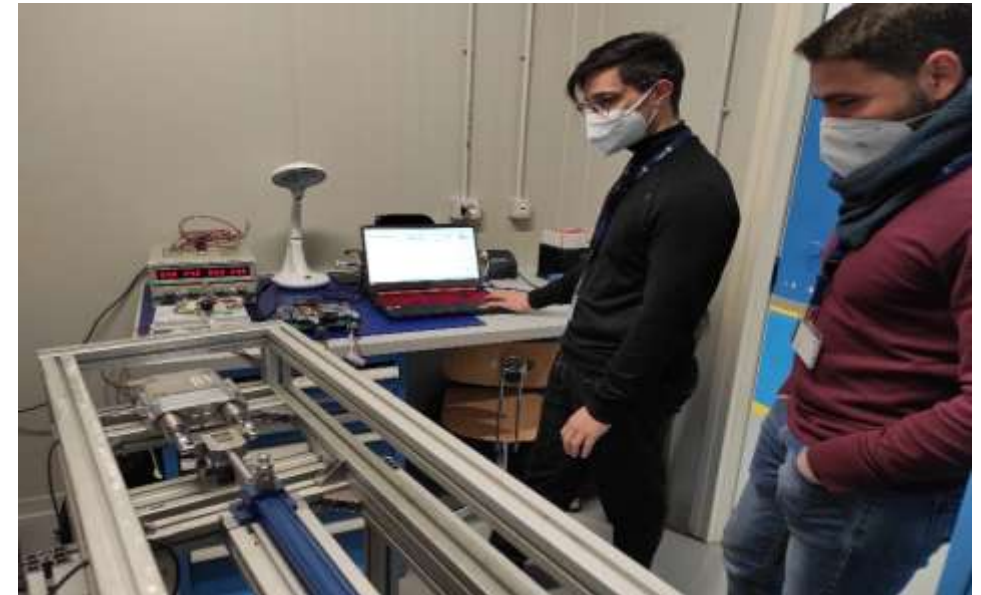
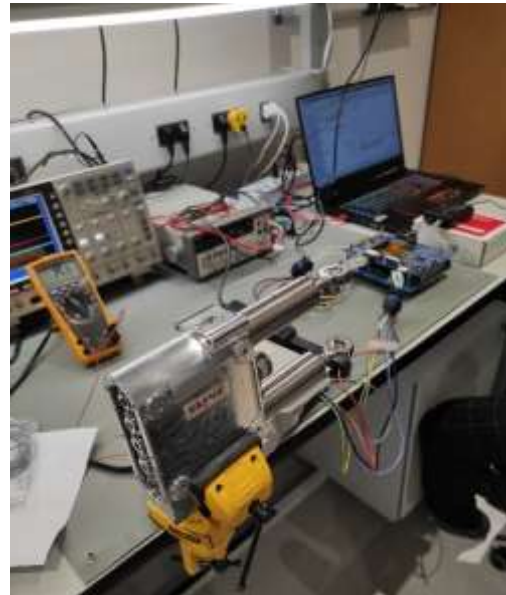
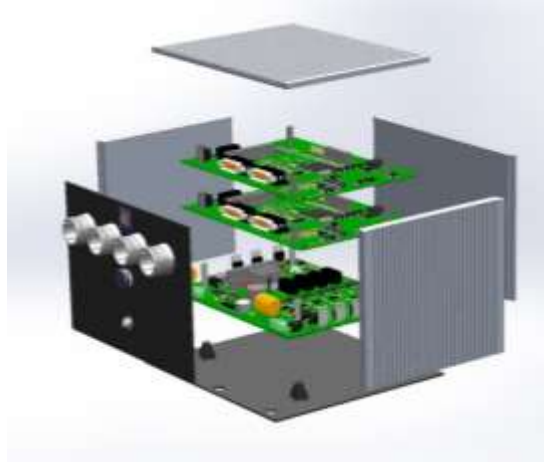
- Main Objective: Development of an innovative “thermal and electro-expulsive De-Icing System” for the Piaggio P180 aircraft (TRL4).
- System was tested in the Ice Wind Tunnel Test (IWT) of CIRA
- Test demonstrates a reduction of power consumption against actual “only thermal” de-icing system
- Italsystem was in charge of control design and SW development (with MBD approach) and of support for test



Research & Development – SWING

SWING – Smart Wing for new Generation Civil UAV

- Main Goal: Design a development of electromechanical control system for the flap of forward wing of P180 (TRL5)
- Italsystem was in charge of:
 - Electronic design e development
 - Control Design
 - SW development





Research & Development – ASTIB

- ASTIB main objectives are to support the improvement of the Technological Readiness Level up to above TRL 6 for a number of significant electrical equipment that are being considered of critical importance for the future Green Regional Aircraft (GRA).
- Italsystem is in charge of SW Design and Development for Electromechanical actuators (EMAs) with their associated electronic control units (ECUs) for flight control surfaces Winglet and Wigtip with morphing capabilities
- Experimental Flight is performed in February 2024

Partners :

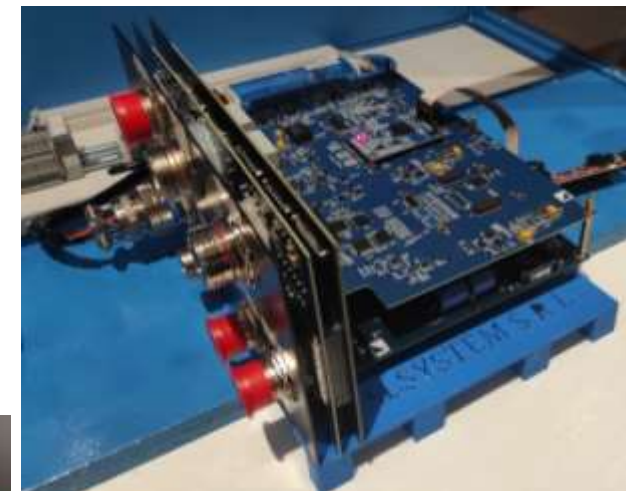
- Umbra Cuscinetti S.p.A.
- Italsystem s.r.l.
- VGA s.r.l.



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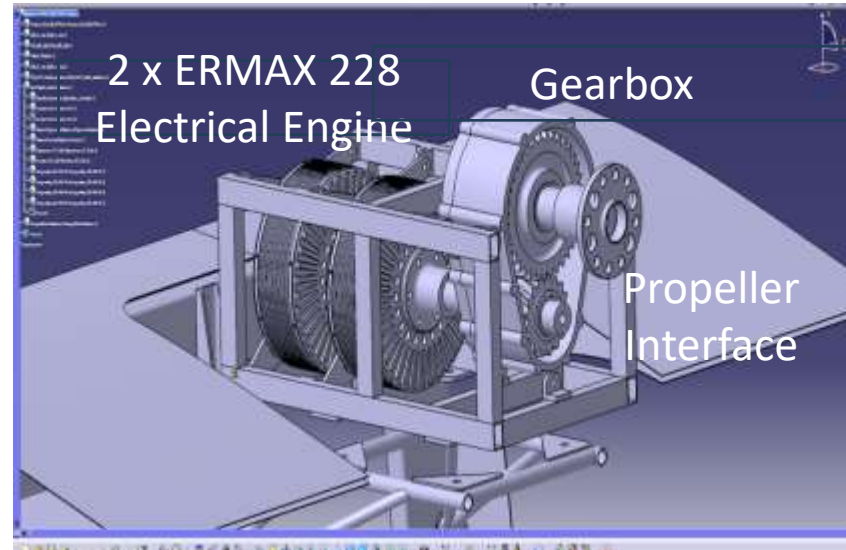
Research & Development – PHAEDRA

- Main Goal is to develop a configurable platform for EMA control (landing gear control, flap control, etc.), so as to achieve a significant reduction in SW development and certification effort.
- Integrate health monitoring and prognostics functionality into the control platform
- Design and develop a test rig to verify the PhAEdRA platform.
- Conclusion : July 2024



Research & Development – SEAGULL Zero-e

- Main goal of SEAGULL ZERO-e project is the development, verification and validation of a full electric propulsion system for SEAGULL aircraft.
- SEAGULL is a VDS aircraft produced by NOVOTECH in Casoria (NA).
- Italsystem is leader of ITALTECH consortium for development of SEAGULL ZERO-e project
- Italsystem is responsible for the development of Engines Control Unit.
- Conclusion within September 2024



Research & Development

EMA CONTROL

- ITS-ECU21 is the outcome of two decades knowledge in Aerospace SW Qualification and more recent experience in Electronic System's Design and Implementation.
- It is fully compatible with Mathworks Tools (Matlab/Simulink) and Model Based Design Approach for SW Development and Qualification.



General Data	Nominal supply voltage	28 Vdc
	Power Supply Voltage Range	20 – 40 V
	Power consumption (electronic only)	15 W
	EMA can be controlled	Linear or rotary EMA 200 – 800 W
Functional Data	Connectors	4 connector D38999
	Digital Bus	Arinc429 interface: 2 x TX and 6 x RX
	Position Sensor input	LVDT (excitation and demodulator)
	Digital Input	4 on EMA connector (28V/open) (Hall Sensor or Encoder) 4 on FCC connector (28V/open)
	Brake driver	One open collector output (28 V 500mA)
	Architecture	COM/MON Architecture based on two SM320F28335 MCU
	Technology Readiness Level	TRL 7
	Certifiable DAL B	
Ambient Conditions	Operating temperature:	-55 °C 70 °C
	Ground Survival Operating Temperature	-55 °C 85 °C
	Hambient humidity	Max. 95% r.H., non condensante
Physical Dimensions	Dimensions	200mm x 140 mm x 150 mm
	Net Weight	5.0 kg
	Optional Futures	Analog Input
Analog output		5 optional analog output +/-10V
Digital Input		4 optional digital input output open- ground
Digital Otput		4 optional digital output open collector
	External regenerative brake resistor driver	

Research & Development

Project On Going

SEAGULL e-VTOL: SEAGULL electrical-Vertical Take-Off and Landing

Start: January 2023 – End: June 2026

Italsystem role: development of cockpit display



SPIRIT - Smart morPhing wlng foR Aircraft muLti-phase ImprovemenT

Start: October 2024 – End: October 2028

Italsystem role: development of Actuator Control Unit



SIPRODI - Dimostratore tecnologico di un Sistema PROpulsivo ad emissioni nulle per Imbarcazioni da Diporto

Start: January 2025 – End: Dicembre 2027

Italsystem role: development of Engine Control Unit



GRAZIE



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