



# Company Profile

February 2019

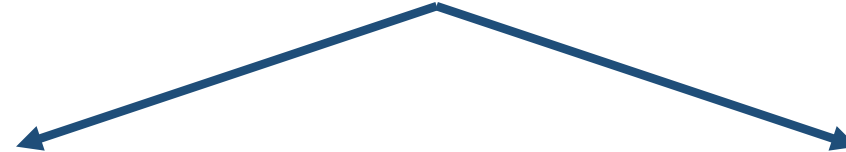
# Our Values

We strongly believe that transparent collaboration among tech companies is a key element to ensure a better future.



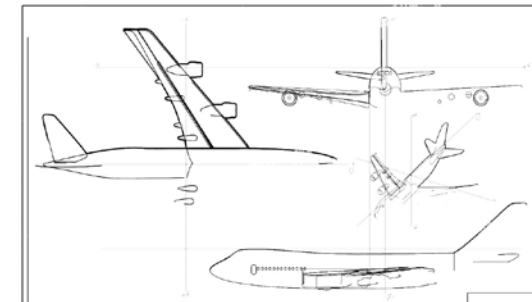
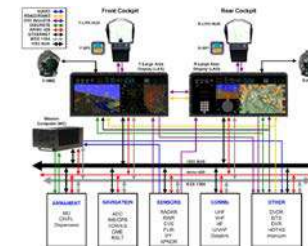
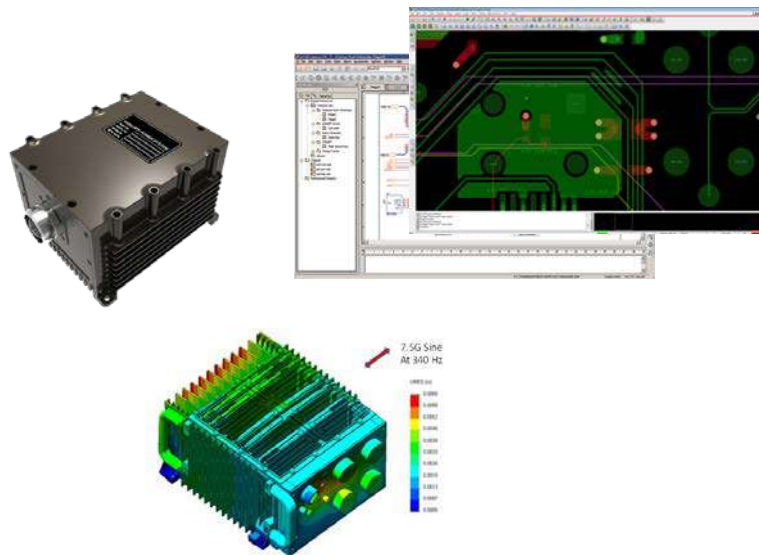
- Transparent collaboration
- Fast and reliable services
- Dynamic team

# What we do



Avionics & Electrical Systems  
**DESIGN & DEVELOPMENT**

Avionics & Electrical Systems  
**INTEGRATION**

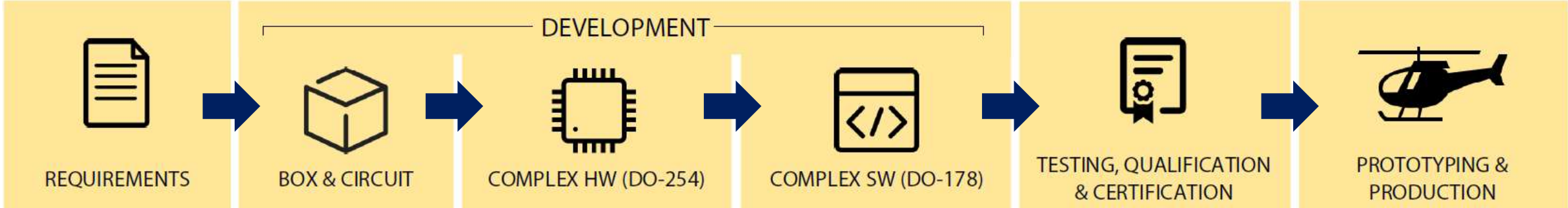


# What we do

## Avionics & Electrical Systems DESIGN & DEVELOPMENT

# Design & Development Flow

Our experts team can perform **EVERY** Avionics Development Activity



# Design

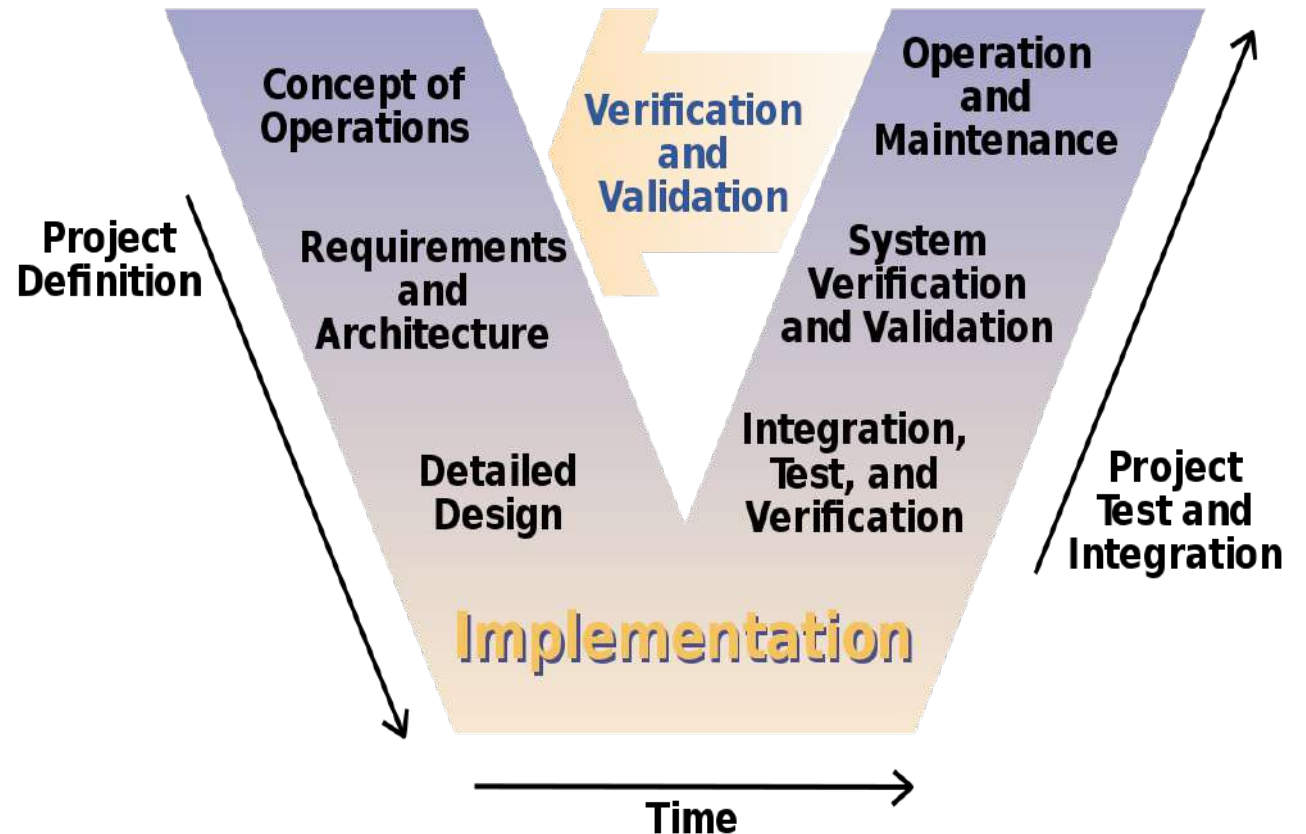
Concept, Design  
Simulations & Reviews

We follow the V-Model development structure, in order to guarantee requirements traceability and ensure proper Validation and Verification.

During the Development process, we produce all the required documentation, explained in the following slides and we can prepare:

- System Requirement Review (SRR)
- Preliminary Design Review (PDR)
- Critical Design Review (CDR)
- Test Readiness Review (TRR)
- Flight Readiness Review (FRR)

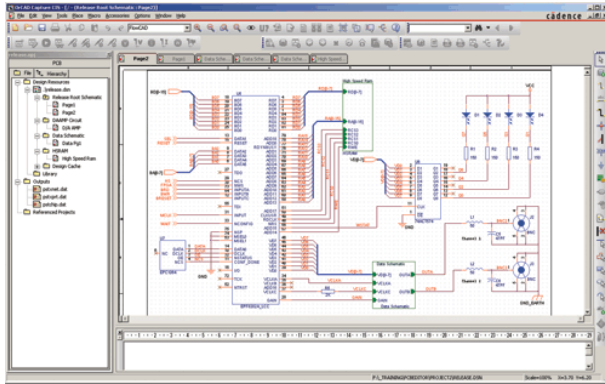
Our team can prepare Design Reviews and Product presentations for you and/or for your customers using your template and logo.



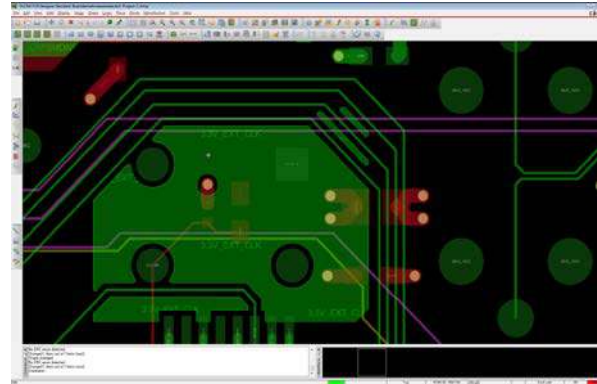


# Design

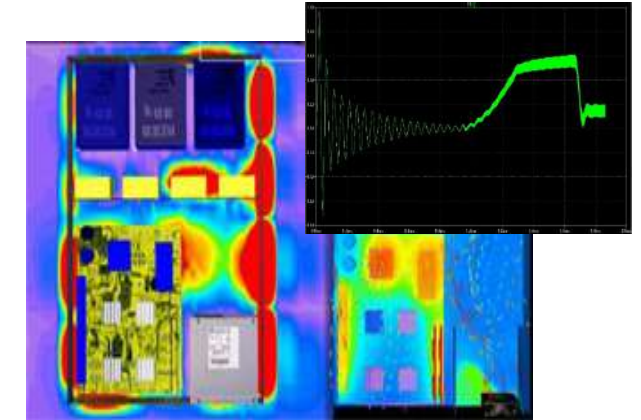
Concept, Design  
Simulations & Reviews



Schematic Block & Electronic  
detailed schematic



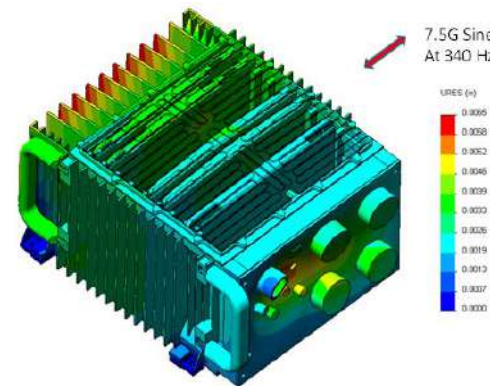
PCB Layout



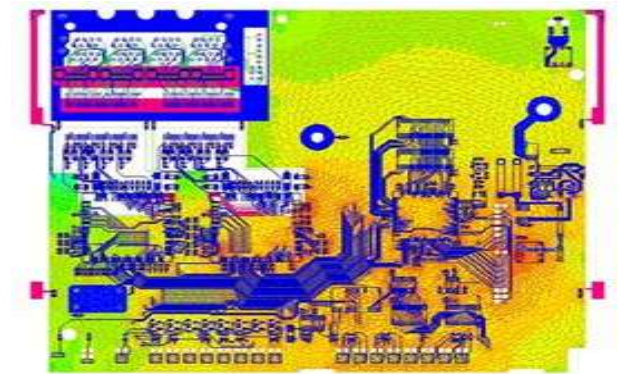
Spice Simulation &  
EMC/EMI Simulation



3D Modelling



Structural Analysis  
(Stress, Acceleration, Vibrations)



Thermal Analysis

# Design | Prototyping

We are capable of producing both electronic PCB boards and mechanical cases:



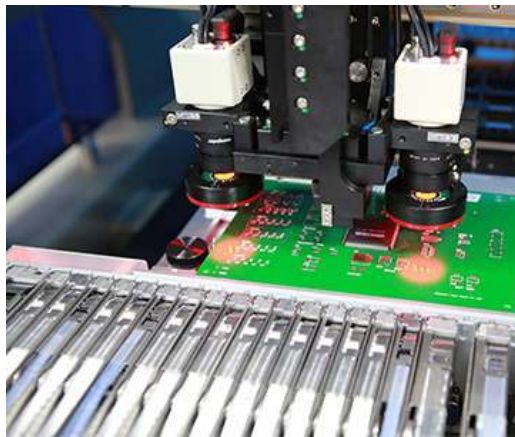
High-quality 3D-Printed objects for reviews and pre-assembly checks

Selective Laser Sintering (SLS) Technology 0,1mm (0,004") precision



Aluminium and Steel cases milling from solid for prototypes and pre-series.

CNC 5-axis Milling  
0,05mm (0,002") precision



In-house SMD and PTH Electronic Boards assembly line

Automatic Pick-and-Place and soldering systems



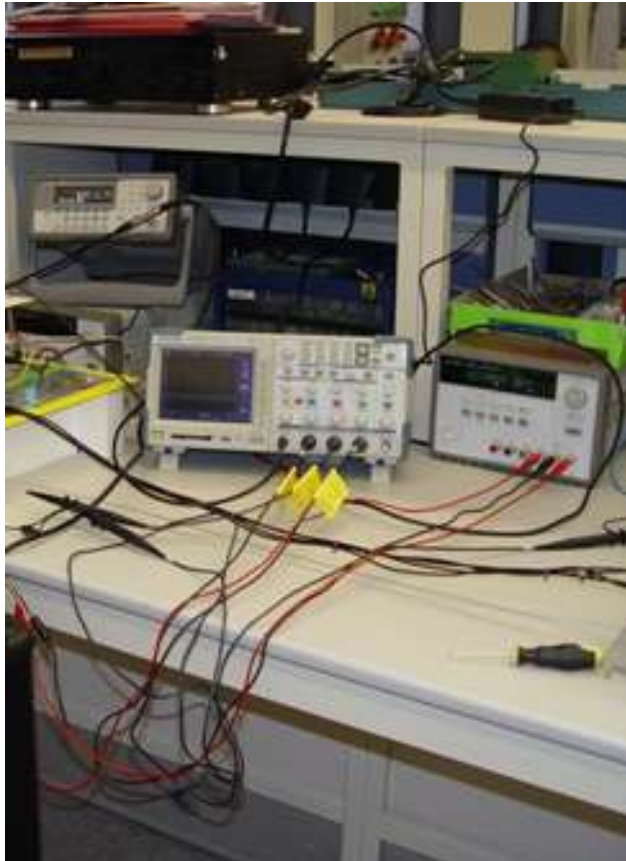
Final Assembly line with automated and manual checks

Microscope Visual Inspection test



# Design

Laboratory &  
Flight testing



- Functional Testing
- Failure Testing
- Acceptance test
- Procedures
- Reports
- Jigs design & Construction
- Dedicated test benches



- Test card preparation for fixed and rotary wing
- Flight test on our partner's platforms
- Logging equipments configuration and installation
- Data analysis
- Report preparation

## Technical Documentation

ARP4754A | AQAP-110 | MIL-STD-1472

- Technical Specification
- Compliance Matrix
- Requirement traceability
- Interface Control Documents
- Weight Report
- Product Acceptance Test Procedure
- Declaration of Design & Performance

## RAMS Documentation

ARP 4761 | MIL-STD-882 | MIL-STD-1629  
MIL-HDBK-217 | MIL-HDBK-781





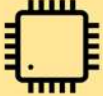

- Component Part List, Primary Defect Rate & Stress Analysis
- FMECA
- Testability Analysis
- Safety Analysis
- Reliability Test Screening (Burn-in)
- Maintainability Analysis
- Maintenance Manual

## Environmental Docs & Testing

DO-160 | MIL-STD-461 | MIL-STD-462  
MIL-STD-810 | MIL-HDBK-2165

- Qualification Test Procedure
- Qualification Test Report
- EMC Test Plan
- EMC Test Report
- Similarity Report
  
- Perform Qual test, EMC, Lightning in our partner's laboratories

# Design | Activities Summary

	 REQUIREMENTS	DEVELOPMENT		 TESTING, QUALIFICATION & CERTIFICATION	 PROTOTYPING & PRODUCTION	
		 BOX & CIRCUIT	 COMPLEX HW (DO-254)	 COMPLEX SW (DO-178)		
ANALYSIS & DOCUMENTS	<ul style="list-style-type: none"> <li>✓ Requirements identification</li> <li>✓ Requirements coverage</li> <li>✓ Cost-benefits analysis</li> <li>✓ Risk analysis</li> <li>✓ Weight allocation analysis</li> <li>✓ Technical specification</li> <li>✓ Compliance matrix</li> <li>✓ Low-level requirement flowdown</li> <li>✓ Requirement traceability document</li> </ul>	<ul style="list-style-type: none"> <li>✓ Block schematic</li> <li>✓ Electronic schematic</li> <li>✓ PCB Layout</li> <li>✓ Circuit spice simulation</li> <li>✓ EMC/EMI simulation</li> <li>✓ Thermal analysis</li> <li>✓ 3D box modelling</li> <li>✓ Structural analysis (Stress, Acceleration, Vibrations)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Plan for Hardware Aspects of Certification (PHAC)</li> <li>✓ Hardware Design Plan</li> <li>✓ Hardware Validation Plan</li> <li>✓ Hardware Verification Plan</li> <li>✓ Hardware Configuration Management</li> <li>✓ Hardware Process Assurance Plan</li> <li>✓ Requirements Standards</li> <li>✓ Hardware Design Standards</li> <li>✓ Validation and Verification Standards</li> <li>✓ Hardware Archive Standards</li> <li>✓ Hardware/Software Interface Data</li> <li>✓ Hardware Acceptance Test Criteria</li> <li>✓ Hardware Traceability Data</li> <li>✓ Hardware Test Procedures</li> </ul>	<ul style="list-style-type: none"> <li>✓ Plan for Software Aspects of Certification (PSAC)</li> <li>✓ Software Quality Assurance Plan</li> <li>✓ Software Development Plan</li> <li>✓ Software Verification Plan</li> <li>✓ Software Configuration Management Plan</li> <li>✓ Software requirements data (SRD)</li> <li>✓ Software design description (SDD)</li> <li>✓ Software Requirement Standard</li> <li>✓ Software Design Standard</li> <li>✓ Coding Standard</li> <li>✓ Software Verification Cases and Procedures</li> <li>✓ Software Verification Results</li> <li>✓ Software Configuration Index</li> <li>✓ Software Lifecycle Environment Configuration Index</li> <li>✓ Software quality assurance records (SQAR)</li> <li>✓ Software conformity review (SCR)</li> <li>✓ Software accomplishment summary (SAS)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Interface control document (ICD)</li> <li>✓ Weight report</li> <li>✓ Declaration of design &amp; performance (DDP)</li> <li>✓ Component part list, Primary defect rate &amp; Stress analysis</li> <li>✓ FMECA</li> <li>✓ Testability analysis</li> <li>✓ Safety analysis</li> <li>✓ Reliability test screening (Burn-in)</li> <li>✓ Maintainability analysis</li> <li>✓ Maintenance manual</li> <li>✓ Qualification test plan</li> <li>✓ Qualification test procedure / report (QTP/QTR)</li> <li>✓ EMC test plan / report</li> <li>✓ Similarity report</li> <li>✓ Testing reports</li> </ul>	<ul style="list-style-type: none"> <li>✓ First article inspection (FAI)</li> <li>✓ Acceptance test procedure (ATP)</li> <li>✓ Assembly check procedure</li> </ul>
ACTIVITIES & REVIEWS	<ul style="list-style-type: none"> <li>✓ System requirement review (SRR)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Preliminary design review (PDR)</li> <li>✓ Critical design review (CDR)</li> </ul>			<ul style="list-style-type: none"> <li>✓ Climatic chamber test</li> <li>✓ EMC test</li> <li>✓ Vibration board test</li> <li>✓ All other DO-160 tests</li> </ul>	<ul style="list-style-type: none"> <li>✓ Test readiness review (TRR)</li> <li>✓ Flight readiness review (FRR)</li> <li>✓ Pre-series unit production (not SOF)</li> <li>✓ Series production (SOF)</li> <li>✓ Wiring harnesses</li> <li>✓ SLS 3d Prototype print</li> <li>✓ Aluminium / steel milling</li> <li>✓ SMD and PTH electronic boards assembly</li> <li>✓ Automated and manual checks</li> <li>✓ Lab functional testing</li> <li>✓ Lab failure testing</li> <li>✓ Test benches</li> <li>✓ Jigs design &amp; construction</li> </ul>

# What we do

## Avionics & Electrical Systems INTEGRATION



# Integration Flow

Our experts team can perform **EVERY** Avionics Integration Activity



# Integration

Integration services for Avionic Systems

CS/FAR 23

CS/FAR 25

CS/FAR 27

CS/FAR 29

FAR 91

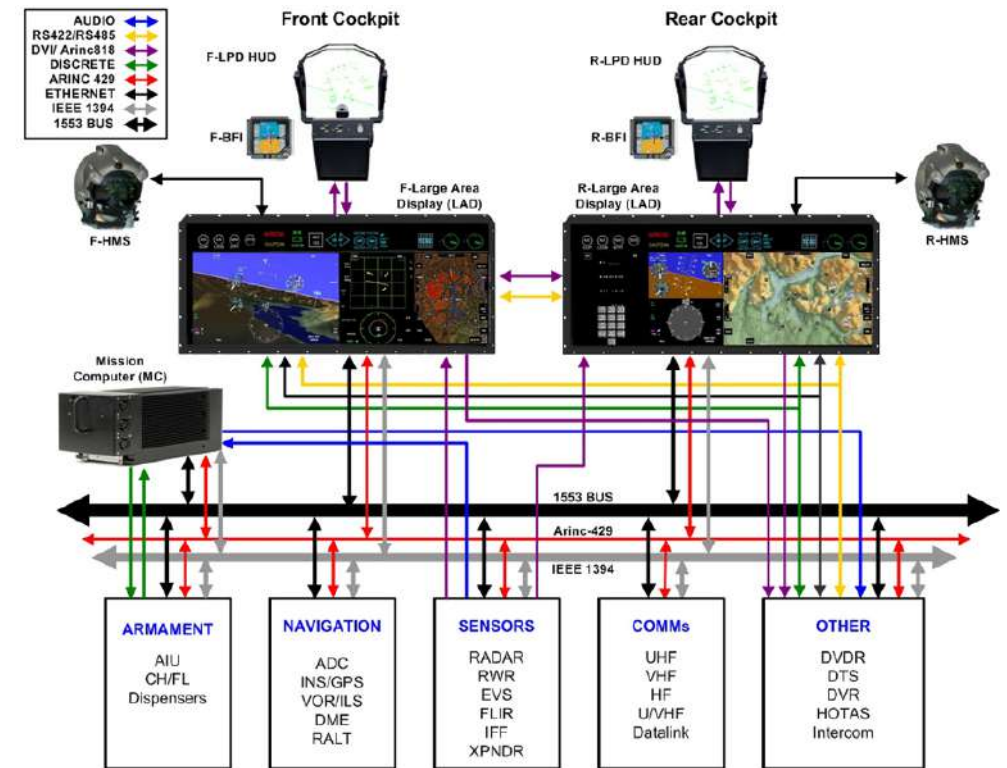
FAR 135

EU OPS

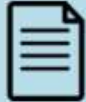




In addition to our Development Activities at the Equipment-level, we also provide Integration Services for Complete Avionic Systems.

Our services include:

- Develop and evaluate trade studies between various system design alternatives
- Generate system-level specifications, schematics, test procedures covering a wide variety of avionics subsystems
- Perform system testing and robustness testing to demonstrate compliance with certification requirements



# Integration | Activities Summary

	 REQUIREMENTS	 DEVELOPMENT	 AIRCRAFT INSTALLATION	 LAB & FLIGHT TESTING	 CERTIFICATION
ANALYSIS / ACTIVITIES	<ul style="list-style-type: none"> <li>✓ EASA CS PART 23, 25, 27, 29 COVERAGE ANALYSIS</li> <li>✓ FAA FAR PART 23, 25, 27, 29 COVERAGE ANALYSIS</li> <li>✓ FAA / EASA OPERATIONAL REQ COVERAGE</li> <li>✓ SUPPLIER SELECTION</li> <li>✓ COMPLIANCE MATRIX</li> </ul>	<ul style="list-style-type: none"> <li>✓ EQUIPMENTS PLACEMENT STUDY</li> <li>✓ ANTENNA PLACEMENT ANALYSIS</li> <li>✓ SYSTEM SEPARATION ANALYSIS</li> <li>✓ AVIONIC BAYS THERMAL ANALYSIS</li> <li>✓ ELECTRICAL LOAD ANALYSIS</li> <li>✓ WEIGHT REPORT</li> <li>✓ OPTIONS (KIT) INTEGRATION ANALYSIS</li> </ul>	<ul style="list-style-type: none"> <li>✓ 3D MODEL EQUIPMENT PLACEMENT STUDY</li> <li>✓ LIGHTNING ZONING</li> </ul>	<ul style="list-style-type: none"> <li>✓ FTI DATA ANALYSIS</li> </ul>	<ul style="list-style-type: none"> <li>✓ COMPLIANCE ANALYSIS</li> <li>✓ GAP ANALYSIS</li> <li>✓ COOLING MARGIN ANALYSIS</li> </ul>
DOCUMENTS	<ul style="list-style-type: none"> <li>✓ SYSTEM HIGH-LEVEL REQUIREMENT DOCUMENT</li> <li>✓ SINGLE EQUIPMENT TECHNICAL REQUIREMENT SPECIFICATION DOCUMENT</li> <li>✓ STATEMENT OF WORK (SOW)</li> <li>✓ ENVIRONMENTAL REQUIREMENT DOCUMENT</li> <li>✓ SAFETY, RELIABILITY, MAINTAINABILITY REQUIREMENTS FOR SUPPLIER</li> </ul>	<ul style="list-style-type: none"> <li>✓ HIGH-LEVEL SCHEMATICS</li> <li>✓ SYSTEM SCHEMATICS</li> <li>✓ REQUIREMENTS DECOMPOSITION</li> <li>✓ REQUIREMENTS FLOW-DOWN</li> <li>✓ SINGLE-SYSTEM REQUIREMENTS</li> <li>✓ DIGITAL BUS DATA-Dictionary (ARINC 429 – MIL-STD-1553 – CAN)</li> <li>✓ PRELIMINARY DESIGN REVIEW (PDR)</li> <li>✓ CRITICAL DESIGN REVIEW (CDR)</li> <li>✓ CAS MESSAGES DEFINITION</li> </ul>	<ul style="list-style-type: none"> <li>✓ INSTALLATION DRAWINGS</li> <li>✓ WIRING DIAGRAMS</li> <li>✓ REGRESSION TEST</li> <li>✓ INSTALLATION CHECKS</li> </ul>	<ul style="list-style-type: none"> <li>✓ FLIGHT TEST PLAN</li> <li>✓ FLIGHT TEST REPORT</li> <li>✓ FLIGHT READINESS REVIEW (FRR)</li> <li>✓ TEST RIG REQUIREMENT SPECIFICATION</li> <li>✓ LABORATORY REGRESSION TESTS</li> <li>✓ TEST READINESS REVIEW (TRR)</li> </ul>	<ul style="list-style-type: none"> <li>✓ HIGH LEVEL FUNCTIONAL AVIONIC DESCRIPTION</li> <li>✓ AVIONIC &amp; ELECTRICAL SYSTEM SUBSTANTIATION ANALYSIS</li> <li>✓ SYSTEM DESIGN REPORTS</li> <li>✓ COMPLIANCE DOCUMENTS</li> <li>✓ CERTIFICATION PLAN</li> <li>✓ VERIFICATION TEST PLAN</li> </ul>
JIGS				<ul style="list-style-type: none"> <li>✓ AVIONICS TEST BENCHES</li> <li>✓ TESTING TOOLS &amp; HARNESSSES</li> </ul>	

# References

Few examples where our technology is onboard



Fighter Jets & Trainers



Personal Flight Vehicles

Tilt-rotor



Helicopters



Surveillance Drones



# Collaborations

Zürcher Hochschule  
für Angewandte Wissenschaften



Brancaro collaborates closely and runs research projects with these universities and centres of excellence. Customers benefit from the key knowledge and understanding that is shared in flexible relationships with academic organisations.



**POLITECNICO**  
MILANO 1863



**POLITECNICO  
DI TORINO**



# Facilities



## Headquarters

Milan – Italy, Piazza IV Novembre, 4  
Offices + Meeting rooms

## R&D Laboratoires

Vercelli - Italy  
Engineering Offices + 1 Meeting room  
Electronic laboratory  
Mechatronic laboratory

## Engineering

Novara - Italy  
Engineering Open Space Center  
Meeting rooms