



CYIENT

COMPLEX AVIONICS SOLUTIONS FOR THE A&D INDUSTRY

Full lifecycle engineering solutions for
safety-critical avionics



Overview

State-of-the-art digital avionics are essential for today's aerospace and defense industry. This is driven by the demand for lighter, smaller, and more efficient avionics systems where software is an integral part of the solution. Given that the life expectancy of a typical avionics system is over 30 years, companies constantly need to extend the component product life, upgrade technology, and consequently, redesign the component.

Cyient collaborates with avionics OEMs worldwide, helping them develop innovative, end-to-end avionics systems—from requirements definition to certification.

By supporting the full product development lifecycle across system, software, firmware, packaging design, and test engineering solutions, we deliver avionics systems that conform to the most rigorous RTCA, FAA, and EASA standards. We also have direct experience in certification to all Design Assurance Levels (DAL) A to E.

Cyient has developed considerable domain expertise for both civil and military applications including:

- Electrical systems
- Weather radars
- Communications systems
- Navigation systems
- Cockpit mission computers
- Flight controls
- Landing gear and actuation systems
- Cabin and cargo management systems
- Air management systems
- Diagnostics

We also support product obsolescence analysis, obsolescence-mandated redesign of in-service LRUs/LRMs, testing, environmental qualification, and low-cost manufacturing of avionic LRUs/LRMs at our AS9100C and Nadcap-approved manufacturing facilities.

The Cyient Avionics Portfolio

Our safety-critical certification engineering services focus on rapid automation of requirements capture, simulation, and validation and verification testing, in turn, reducing project timeline and costs.

By combining our rich and extensive experience in aerospace, integrated avionics product development processes, and systems engineering, we help OEMs to develop or upgrade LRUs/LRMs efficiently. We employ flexible business models such as firm fixed price, risk and revenue sharing, and co-development business models to deliver maximum value to our clients.

OUR AVIONICS CAPABILITIES

System development lifecycle activities

Complete product lifecycle including planning, requirements capture, design, integration, problem report management, validation, verification, and certification support (according to SAE ARP 4754A).



Mechanical design and engineering

System, sub-assembly, and component design; modeling and analysis (structural and thermal); and reverse engineering, simulations, and CFD.

Aerospace process-based integrated project management

Integrated project plan, project-specific process, monitoring and control of projects, as well as integrated product development process (systems, hardware, software, mechanical, manufacturing and after sales support).

Embedded software design, verification and validation lifecycle

Complete product lifecycle including planning, requirements, design, implementation, integration, and verification as per RTCA DO-178C.



System and CCA test engineering and ATE development

Circuit board and LRU test plans, environmental qualifications, platform-based ATE design and development, and customized test system development.



Prototyping

PCB prototyping, rapid prototyping, LRU build, test jigs, fixtures build, and tooling.

Safety and reliability engineering

System Safety Assessment (SSA), Single Event Effect (SEE) analysis, Common Mode Analysis (CMA), Fault Tree Analysis (FTA), and reliability prediction to MIL-STDs/ SAE ARP4761.



Electronics hardware design, verification and validation lifecycle

Planning, requirements capture, conceptual design, detailed design and analysis, implementation, verification and qualification of complex electronic hardware (CEH), and circuit card assembly (CCA) as per RTCA DO-254.

Technical publications

Detailed engineering drawings, component maintenance manuals, and user manuals.

Cable harness design and manufacturing

Design and route electrical wiring, harnessing, cabling using schematics, Bill of Material (BOM), and advanced testing.

Design analysis

Stress analysis, worst case analysis, signal integrity, design FMEA, thermal analysis, design for "ilities" (DFM/DFA/DFT/EMI/EMC), and obsolescence analysis.



LRU chassis machining

LRU mechanical enclosure, precision machining on aluminum, Inconel, titanium and magnesium, and RF antenna.



Automated testing, certification, and conformance

Proprietary tools and bench testing environment to support fully automated testing, qualification, and pass/fail determination—for software, hardware, and tools.

HASS/HALT testing

Environmental Stress Screening (ESS), component-level screening, determining screening levels and operating and destruct margins.

Circuit board assembly and production

PCB assembly—SMT and PTH, ROHS, REACH, lead/lead-free, IPC-610E, Class II/III, J-STD-001E, Nadcap-approved PCB process, AOI, x-ray inspection, conformal coating, IRIS/ISO9001/ AS9100/ISO13485 approved assembly, and ICT/FPT testing.





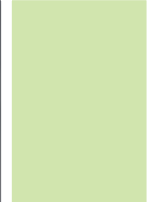
Testing environment generation

Real-time, fully-automated testing environment generation to support the use of automated test case execution and automated determination of pass/fail on electronic mission-critical systems.



Tool qualification

DO-330 tool qualification capabilities.



Technical publications

Detailed engineering drawings, component maintenance manuals, and user manuals.



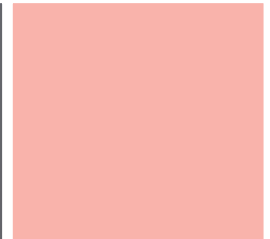
Consulting and training

Consulting and training for DO-178C and DO-254 processes.



Model-based design

Model-based design utilizing our proprietary tool, CertSAFE, and other key industry tools such as Scade and Simulink.



Extended Avionics Engineering Capabilities

Cyient continues to leverage our partner ecosystem to deliver advanced solutions to our clients. These added capabilities include:

Part manufacturing

Enclosure manufacturing using aluminum alloy 6061, part tooling, and finishing process.

Environmental qualification testing

MIL-STD-461C/E, MIL-STD-810G, RTCADO-160, IEC 61000 pre-qualification tests.

Packaging manufacturing

Electronic packaging for enclosures, hermetically sealed casing semi gaskets, and card cages.

Sourcing of electronic parts

Supply chain management, procurement specialists, End-of-Life (EOL), complete BOM sourcing, RoHS compliance, and global sourcing.



CYIENT COLLABORATES WITH GLOBAL AVIONICS OEMS TO DEVELOP INNOVATIVE, END-TO-END AVIONICS SYSTEMS—FROM REQUIREMENTS DEFINITION TO CERTIFICATION

Standards and Accreditations

- RTCA DO-254 for complex electronic hardware
- RTCA DO-178C for software and environmental compatibility
- RTCA DO-160G for commercial aviation
- MIL-STD-810F for defense systems
- DO-178C and DO-254 certification and conformance, Design Assurance Levels (DAL) A to E compliant
- ARP-4754A and ARP-4761 system and safety engineering capabilities
- FAA, EASA, Transport Canada, ANAC and MIL-STD certification experience
- DO-178C and DO-254, DAL-A, vetted employees
- AS9100 rev D, ISO9001, ISO 14001 certified, CMMI Level 3
- Direct experience with all four Stages of Involvement (SOI) audits

THE CYIENT EDGE

Cyient offers a comprehensive range of avionics engineering solutions across the aerospace and defense lifecycle—from new product design and manufacturing to obsolescence redesign.

Tier 1 avionics suppliers and OEMs world over trust Cyient with their avionics programs. We work together with our clients in collaborative partnerships with the objective of creating innovative avionics solutions for the aircraft of tomorrow.



About Cyient

Cyient (Estd: 1991, NSE: CYIENT) provides engineering, manufacturing, geospatial, networks, and operations management services to global industry leaders. We leverage the power of digital technology and advanced analytics capabilities, along with domain knowledge and technical expertise, to solve complex business problems. As a Design, Build, and Maintain partner, we take solution ownership across the value chain to help our clients focus on their core, innovate, and stay ahead of the curve.

Relationships lie at the heart of how we work. With over 14,000 employees in 21 countries, we partner with clients to operate as part of their extended team, in ways that best suit their organization's culture and requirements. Our industry focus spans aerospace and defense, medical, telecommunications, rail transportation, semiconductor, utilities, industrial, energy and natural resources.

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