CYIENT

AVIONICS SOLUTIONS FOR THE AIRCRAFT OF TOMORROW

Safety-critical avionics solutions for the digital world

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

System and integrated engineering capabilities play a vital role in the development of new technologies. We provide collaborative support for avionics OEMs worldwide with the purpose of 'Designing Tomorrow Together'; helping them develop innovative avionics systems, from requirement definition to certification.

Cyient develops and supports the full lifecycle assimilating system, software, firmware, packaging design, and test engineering solutions to deliver avionic systems conformant to the most rigorous RTCA, FAA, and EASA standards, and which are also ARP4754A development assurance level (DAL) A to E compliant. Cyient has significant subject matter expertise for both civil and military applications including:

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

All the systems developed by Cyient conform to certification objectives of RTCA DO-254 for sophisticated electronic hardware, RTCA DO-178C for software and environmental compatibility, comply with RTCA DO-160G for commercial aviation, and MIL-STD-810F for defense systems.

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

Cyient's avionics portfolio is bolstered by the acquisition of CERTON which extends our capabilities around safety-critical systems, embedded software, and electronic hardware certification. Core competencies encompass process-oriented product development lifecycles where testable requirements are developed to support fully automated independent verification and validation. Our safety-critical certification engineering services focus on rapid automation of requirements capture, simulation, validation, and verification testing wherever possible to reduce project timeline and cost.

We combine our aerospace experience, integrated avionics product development processes, and systems engineering expertise to develop or upgrade LRUs/LRMs at a lower cost and with a shorter lead time. Our robust aerospace experience allows utilization of flexible business models such as time and material, firm fixed price, risk and revenue sharing, and co-development business models; while adding value to our avionics clients.

OUR AVIONICS CAPABILITIES INCLUDE:

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

Electronics hardware design, verification and validation lifecycle
Planning, requirements, 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.

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 Line Replaceable Unit (LRU) test plans, environmental qualifications, platform based ATE design and development, customized test system development.

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

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

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.

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

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

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.

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

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

LRU chassis machining
LRU mechanical enclosure, precision machining on aluminum, Inconel, titanium and magnesium, 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, determine screening levels, operating and destruct margins.

Consulting and training
Cyient provides consulting and training for DO-178C and DO-254 processes.

Model Based Design
Model based design utilizing CertSAFE.

Tool qualification
DO-330 tool qualification capabilities.

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.

Our avionics engineering capabilities—through our partner ecosystem:

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

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.

Environmental qualification testing
MIL-STD-461C/E, MIL-STD-810G, RTCA DO-160, IEC 61000 pre-qualification tests.

At Cyient, we have a comprehensive range of avionics engineering solutions throughout the full aerospace and defense lifecycle—from new product design, and manufacturing to obsolescence redesign.

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

STANDARDS AND ACCREDITATIONS

- DO-178C and DO-254 certification and conformance, all Design Assurance Levels (DAL).

- ARP-4754A and ARP-4761 system and safety engineering capabilities.

- FAA, EASA, FDA, Transport Canada, ANAC and MIL-STD certification experience.

- DO-178C and DO-254, DAL-A, vetted employees.

- AS9100C, ISO9001, ISO 14001 Certified. CMMI Level 3.

- Direct experience with all 4 Stages of Involvement (SOI) audits.

About Cyient

Cyient (Estd: 1991, NSE: CYIENT) provides engineering, manufacturing, geospatial, network 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 nearly 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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