

Optimizing next-generation flight.

Optimize and validate aviation technology faster with our flexible, high-performance test bench solutions that reduce costly ground and flight testing.

opal-rt.com/aero



Who we are

With nearly 30 years of expertise in Hardware-in-the-Loop simulation, we serve the aerospace, automotive, and energy markets worldwide. Backed by a team of hundreds of experts, we deliver cutting-edge solutions that help engineers refine and test complex systems with precision.

Why choose us



Deep industry experience

Accelerate your development cycles and increase test output with our open, flexible solutions that integrate seamlessly with your existing testing architectures.



A trusted partner

Reduce costs, mitigate risks, and ensure solutions fit your unique requirements through a collaborative approach and adaptable project management, accommodating changes during the manufacturing phase.



Respected deadlines

We manufacture our simulators in-house with COTS components, providing custom and innovative designs while ensuring reliable delivery times.

Our services

TEST BENCH CAPABILITIES

- Avionics systems
- Cybersecurity
- Electric propulsion systems
- Electrical power generation system (EPGS)
- Engine control systems (EEC/FADEC)
- Environmental control systems
- Flight control systems
- Guidance, navigation, and control systems (GNC)
- Landing gear systems
- Spacecraft systems
- Weapons control systems

INDUSTRY STANDARDS

- Communication protocols (ARINC 429, Aurora, CAN, CAN FD, I2C, MIL-STD-1553, UART, RS-232/422/485, SPI/ISO-SPI, UDP/UCP-IP, & more)
- Multiple modeling environments (MatLAB Simulink, FMI, C, C++, VHDL, Java, & more)
- Test benches designed to support DO certification (ex: DO-178C & DO254)
- Program lifetime support



Serving clients globally with offices in:
Canada, U.S.A., France, Germany, Brazil, and more.

Safer, smarter testing.

Modern aircraft rely heavily on **advanced electric drives** and power electronics, which introduce complex challenges in design, validation, and verification. To address rising power demands while reducing currents and wiring sizes, **high-voltage DC** power grids and **optimized power electronics** are becoming standard.

Rigorous testing is critical to ensuring operational safety and preventing catastrophic failures. The rapid dynamics of these systems require sophisticated control strategies and **advanced testing environments** to detect and **resolve faults early in development**.

Other customers include BAE, BETA Technologies, Boeing, GE Aviation, Heroux Devtek, Liebherr, NASA, Rolls Royce, United Technologies, US Airforce, US Navy, Safran, Woodward, Zeroavia, and more.

On/off charger

Our optimized solvers simulate the fast switching power electronics circuitry found in vehicle charging equipment, at full frequency.

High precision motor on FPGA

High-fidelity, real-time motor simulation on FPGA for precise modeling and testing of electric motor systems.

Multiple motors configuration

Easily scale from single motor to multiple motor powertrain configurations, allowing for system-wide coupling and faulting analysis.

PHIL simulation to test power components

Power Hardware-in-the-Loop (PHIL) simulation enables comprehensive testing of battery packs, full powertrains, and individual components at full power.



Simulation of electrical networks

Simulate the entire electrical infrastructure—generators, high-voltage DC grids, loads, and control systems—to optimize performance and minimize ground testing.

Battery management system (BMS)

Our flexible BMS solution gives you full control over your system and allows seamless integration of new technology as it's introduced to the vehicle.

AI & autonomous guiding

Integrate new technologies like data fusion, deep learning, and advanced sensors—including cameras, RADAR, and LIDAR—into your vehicle seamlessly.



magnIX success story

[Our] objective was to test the control software designed for the flight in a very short period of time. OPAL-RT systems helped in the rapid modeling and emulation of hardware used for the verification and validation of the software.



Akshat Yadav

Power Electronics Engineer at magnIX

[Read more:](#)

