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NI Solution Brief

Systems Integration Lab Test ("Iron Birds")

Integrate multiple subsystems for testing at the vehicle level in a setup that approximates the actual vehicle layout and system connections as closely as possible. Manage a complex test setup that must integrate multiple system test rigs and flight simulation software.

Application Requirements

• Ability to connect multiple simulators using reflective memory so the network of simulators can act as a single system

• Custom signal conditioning, fault insertion, mil-aero buses

• Enterprise-level systems and data management

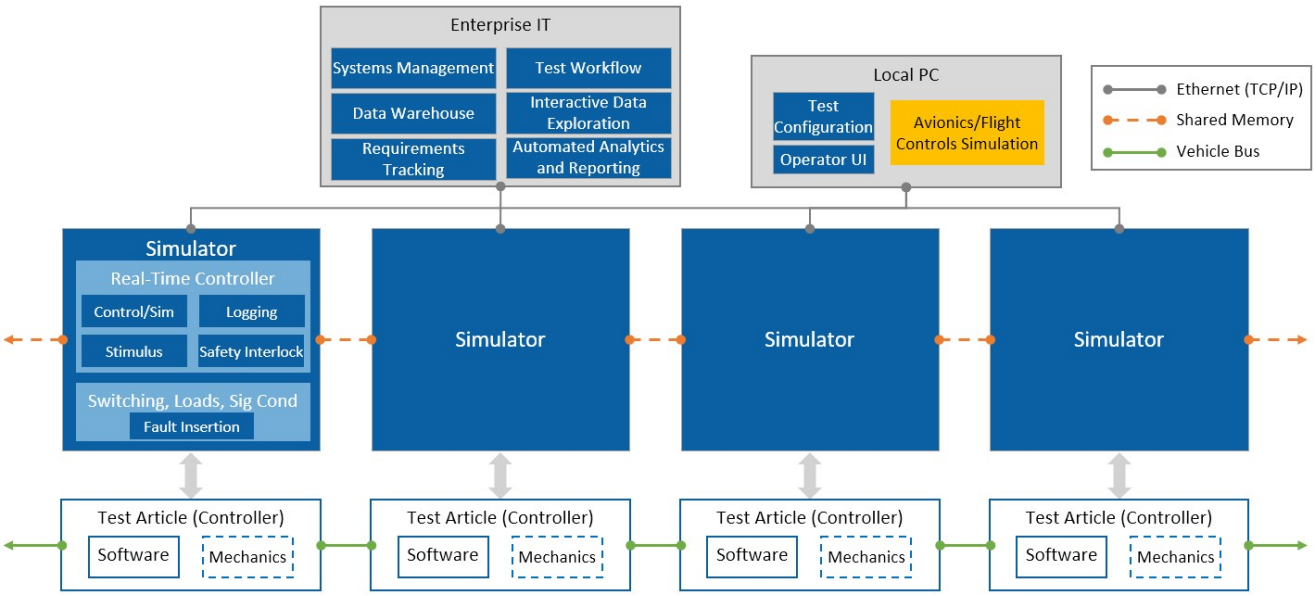
The NI Advantage

- Build a universal test setup to enable high reuse across test types and programs with NI's HIL Reference Architecture
- Better utilize data and more efficiently manage systems with NI's enterprise-ready cloud-based tools
- Easily integrate third-party equipment and customize software and hardware to meet unique test requirements
- Take advantage of an ecosystem of expert hardware-in-the-loop (HIL) specialty partners

NI Solution

- Integrate models from your environment of choice (The MathWorks, Inc. Simulink® software or otherwise) with NI VeriStand
- Reuse modular signal conditioning and fault insertion between test systems with NI switch load signal conditioning (SLSC) hardware
- Leverage a modular and flexible test architecture with NI PXI systems incorporating reflective memory

System Diagram



Example System Configuration

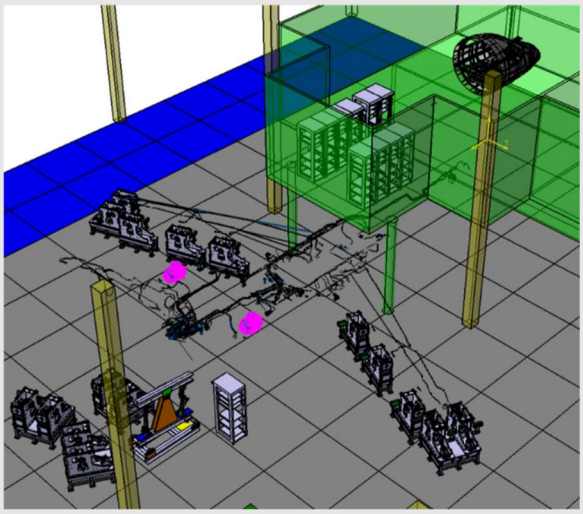
Embraer Performs Full Airplane Simulation Using NI HIL Tools

"We selected NI VeriStand for the Legacy 500 Iron Bird because of the breadth of functionality the environment provides out of the box, which significantly reduced our development efforts."

Guilherme Seelaender, Embraer S.A.

System Scope

- 50+ engine control units
- System model with 90,000 parameters and signals
- 1000+ digital and analog I/O devices and avionics buses
- Deployment to 21 PXI real-time systems
- Synchronization by IRIG B
- Ability to share 74,000 parameters across reflective memory at 100 Hz to yield a 60 MB/s data rate



Results

By using NI solutions, Embraer *reduced development and test time by one year*, from 42 to 30 months, when compared with its previous airplane simulation approach.

Use VeriStand and PXI for Model-Base Control and Simulation in System Integration lab Test Setups

Simulink® is a registered trademark of The MathWorks, Inc.
A National Instruments Alliance Partner is a business entity independent from National Instruments and has no agency, partnership, or joint-venture relationship with National Instruments.

System Integration on Your Terms

NI offers a variety of solution integration options that can be customized to your application-specific requirements. You can use your own internal integration teams for full system control or leverage the expertise of our worldwide network of Alliance Partners to receive a turnkey system.

Contact your account manager or call or email us to learn more about how NI can help you increase product quality and accelerate test timelines.

(888) 280-7645
info@ni.com