

Body ECU Hardware-in-the-Loop Test

Increasingly sophisticated and interconnected interior, infotainment, and advanced driver-assistance (ADAS) systems have expanded the number and complexity of body electronic control units (ECUs)—from active suspension, braking, and emergency steering to seat control and rearview mirror ECUs integrated with infotainment systems. When testing the embedded software on these ECUs, safety, availability, or cost considerations can make it impractical to perform the necessary validation tests using a complete system. Hardware-in-the-Loop (HIL) test methodology brings test earlier in the design cycle. Creating that tester on a flexible software-defined platform makes for a flexible system that can adapt as ECU design and test requirements change.

Application Requirements:

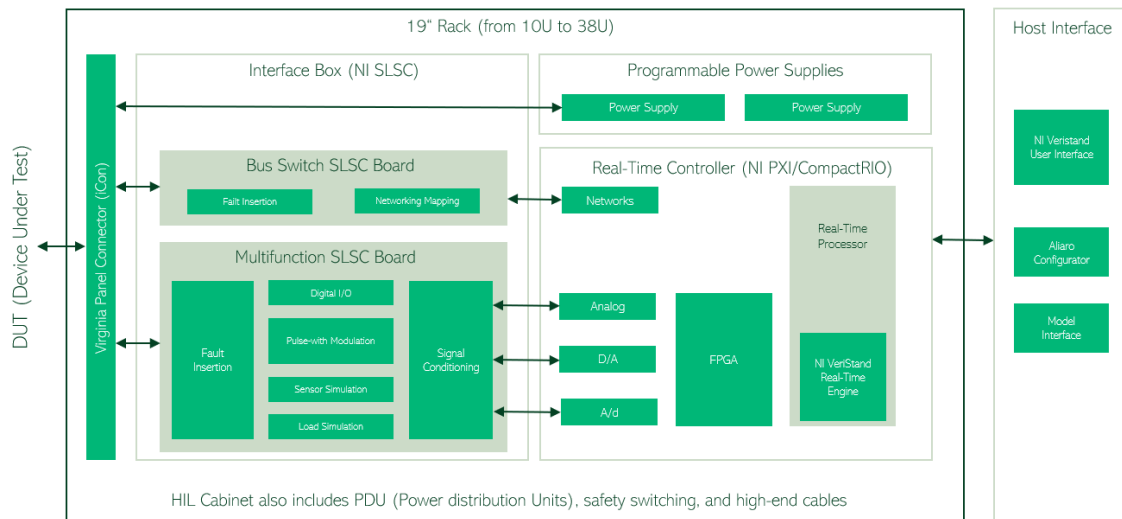
- Adapt to inevitable changes in signal lists and I/O requirements.
- Conduct fault insertion and signal conditioning.
- Integrate models, third party devices, and toolkits to accurately simulate the full system.

NI + ALIARO Solution

If your ECU pinout changes, quickly reconfigure your system setup using ALIARO xMove Configurator Software and the ALIARO AL-1010 switch load signal conditioning (SLSC) module, which provides flexible I/O, signal conditioning, and switching capabilities on each channel, and fault injection on all pins.

User-friendly model integration with NI VeriStand for sensor and actuation simulation, and I/O interfacing with NI PXI and CompactRIO hardware incorporating the latest Xilinx FPGA technology for μ s-level, real-time, model-based simulation of power electronics, actuation, and sensors.

Suitable for multi-vendor test environments with an open platform and support for ASAM XIL, CANoe, dSPACE ControlDesk, and a number of Python frameworks.



SYSTEM DIAGRAM

NI + ALIARO Advantage

- Minimize cost and ensure reliability with HIL test methodology, reducing the need for costly real-world tests.
- Reduce test development time and enjoy quick startup with a turnkey system built with ALIARO's integration and NI's modular platform.
- Maximize system reuse with a flexible tester designed to be extended and customized to meet your changing requirements.

Key Specifications	
Dimensions	38U (1.8m x 0.6m x 0.8m)
Max I/O per Cabinet	380
Flexible I/O Functionality	Analog I/O, Digital I/O, PWM I/O
Resistor Emulation Support	Yes (Flexible Configuration)
Electrical Fault Insertion	Yes, on All Channels
Bus Fault Insertion Support	Yes (CAN, LIN, Automotive Ethernet)
ASAM Support	Yes
Simulation Model Support	Yes (Supports Models Supported in VeriStand)
Current per DUT Channel	1 to 10 A (Max 40 A by Parallel Channels) depending on configuration

ALIARO Body ECU test solutions are based on NI platform.



“The major advantages which made us pick NI and ALIARO were third party integration of smaller suppliers, time to delivery, price advantage, agile development, and VeriStand. We found VeriStand to be very intuitive and easy to work with.

The car project for which the HIL is intended evolved as we created the specs for the HIL, which meant that we could not deliver a full spec order. NI and ALIARO were flexible and preferred communicative delivery.”

Test Coordinator, Major OEM

CONTACT PARTNER