HIL Simulators

Reduce cost and increase test coverage with HIL Simulators. Built on an open, modular architecture that leverages the latest technologies, HIL Simulators are flexible enough to meet the needs of the most demanding embedded software test challenges.
Increase Your Embedded Software Test Coverage

With industry-leading customizability, HIL Simulators help you easily adapt to changing test requirements across a wide variety of application areas, including advanced driver assistance systems, electrification, and advanced sensor integration with cameras, radar, and ultrasonics. Additionally, these simulators provide easier test system commissioning and system integration so you can find more ECU defects faster.

- Model integration from more than 20 simulation environments, including The MathWorks, Inc. Simulink® software
- Fault injection for networks and electrical systems
- Electrical load integration
- RF and camera I/O to keep pace with the latest industry trends
- User-programmable FPGA-based I/O for advanced models
- Flexible bus support including CAN, LIN, FlexRay, ARINC, AFDX, and MIL-STD-1553
- Unlimited expansion capabilities through multiple system connections

HIL Simulators are built on an open and modular architecture based on commercial off-the-shelf (COTS) hardware like PXI and SLSC to ensure that you can customize systems to meet your test needs and keep pace with evolving industry trends.
Test Systems for Today and Beyond

HIL Simulators are built to be future proof so that new technology advancements are easy to integrate without drastically increasing ownership and integration costs.

Easily Get Started and Integrate With Existing Systems
Existing simulation models and test infrastructure are massive investments. That’s why HIL Simulators work with more than 20 different modeling and simulation environments and support the latest ASAM XIL standard to ensure integration with any existing infrastructure.

Increase Test Coverage With the Widest I/O Breadth
Advancing technology is introducing new I/O requirements into HIL test systems. Because NI systems already natively support advanced sensors like cameras and radar and are based on open technology standards, you can easily integrate new I/O types as they become available.

Maximize Efficiency With Infinitely Customizable Build Options
HIL Simulators are modularly architected and built on COTS technology. This means you can offload the development and maintenance risk of common components and still focus on applying your specific application expertise to customize what is needed without being boxed in by closed test systems.

Test Systems Tailored to Your Needs
Because HIL Simulators are built on an open and modular platform, they can be customized to meet the test needs of a wide array of ECUs, LRUs, and system integration labs including:

- Engine
- Body control
- Avionics
- Inverters
- Flight actuators
- Transmission
- EPS
- Motors
- Mechanical HIL and hybrid simulation
- Iron birds and systems integration labs

“We chose an NI HIL test system because it is built on open, standard platforms that allowed us to reduce the overall cost of test and long-term maintenance and ownership of our hardware.”

Anders Tunström, Saab Aeronautics
Get Up and Running With Out-of-the-Box Functionality

Start with ready-to-run software for real-time stimulus generation and data logging with the VeriStand open software environment. Then take advantage of the flexibility and security of NI’s open development platform to add application-specific functionality with LabVIEW, C/C++, Python, and a host of other languages.

Multicore-Enabled Real-Time Engine
- Configure real-time hardware I/O interfaces including NI FPGA-based RIO hardware
- Detect and respond to events with configurable alarms and procedures
- Connect simulation models and closed-loop control algorithms to I/O and other real-time tasks

Run-Time Editable User Interface
- Monitor application data, alarm states, and system execution metrics
- Enable test automation with macro recording or TestStand, .NET, and other software
- Regulate operator access levels with the user management utility

Real-Time Stimulus and Data Logging
- Generate stimulus signals from recorded data or other software environment profiles
- Use branching and looping steps or Python scripts to implement advanced test sequences
- Configure data-logging tasks with independent logging rates, channel sets, and trigger conditions

Global Support, Locally Delivered

NI has offices in 49 countries around the world. Additionally, our worldwide Alliance Partner Network has years of vertical industry and NI systems integration experience to deliver and support a test system that meets your specific application requirements. To find a partner in your area, visit ni.com/findapartner.

Turnkey Test System Delivery and Support
NI Alliance Partners are trusted experts with in-depth industry and HIL knowledge to effectively deliver and support the most complex test systems. In collaboration with NI, our partners deliver turnkey embedded software test systems for your exact test needs.

Professional Services
The experienced team of NI engineering professionals and Alliance Partners is ready to tackle any challenge you face to ensure your success.
- Prototyping and feasibility analysis
- Integration and upgrade services
- Engineering consulting and development assistance

ni.com/hil-simulators