![SAAB RDS - TECHNOLOGY ENABLER]

EV TEST SOLUTIONS

SAAB RDS CAPABILITIES

We are pleased to present our cutting-edge electric vehicle (EV) research bench and simulation test systems solutions. The increasing demand for EVs requires advanced research capabilities and reliable test systems to ensure their performance, safety, and compliance with industry standards.

At SAAB Research & Development Systems we specialize in developing and delivering advanced EV solutions that are designed to meet the unique requirements of the EV industry.

Our open platform solutions provide a real and virtual testing environment where you can simulate real-world scenarios and evaluate the performance of your EVs under various conditions. Our team of engineering experts offer an NI- based extensive experience, can advise and provide the necessary tools to evaluate the performance and safety of EVs, batteries, charging systems, and other related components. We will be with you along the way, offering comprehensive technical support, including online resources, training, and support from experienced engineers.

WHY CHOOSE US ?

Our team is conformed by **domain expert engineers.**

Customized Solutions.

Local **System Integration** services.

Leading industry vendor network.

OEM Suppport for a lower Total Cost of Ownership (**TCO**).
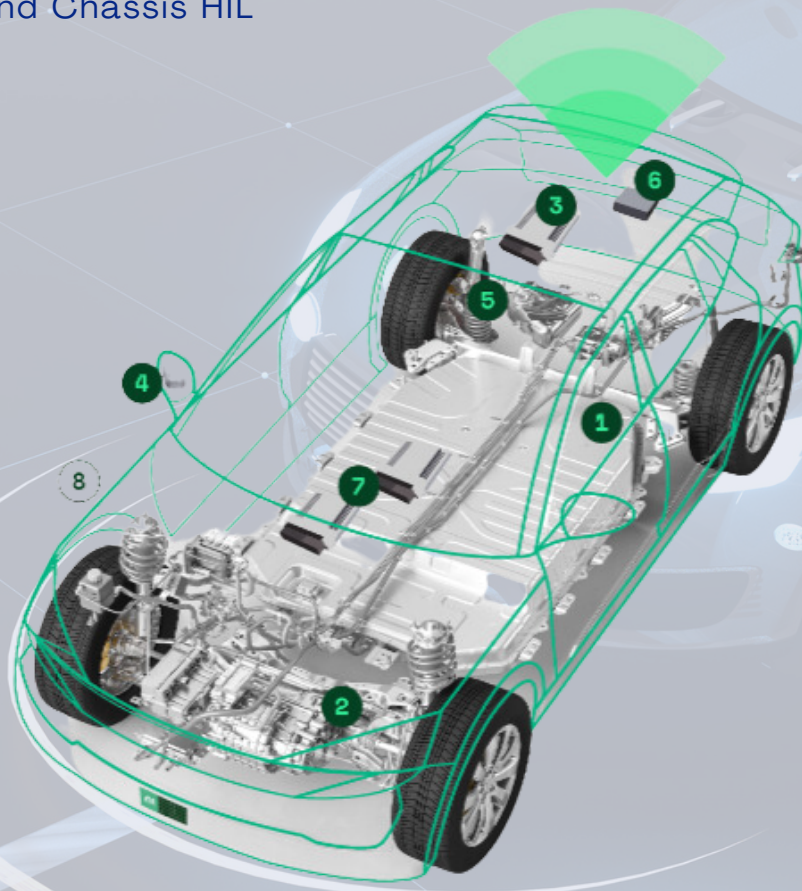
Long-term **local support** for lower risk.

System **scalability** and adaptability to requirements changes for **faster time-to- market**

1. Electric Vehicle Battery Test:
- EV Battery Test System
- Battery Cell Production Test

2. Electric Vehicle Test Systems: engine, body, and chassis
- ECU Functional Test
- Body and Chassis HIL

3. Connected Cars C-V2X Conformance Tests Vehicle Systems Integration HIL

4. Electric Drive Test
- Inverter Test System
- Onboard Charger Testing

1.

ELECTRIC VEHICLE BATTERY TEST

An electric vehicle (EV) battery is a crucial component that powers the vehicle. The battery is responsible for storing and supplying the energy needed to drive the electric motor. To ensure the performance and longevity of the battery, various tests are conducted during the development, production, and operational stages of an EV. These tests are designed to measure the battery's capacity, efficiency, durability, and safety under various conditions.

The Battery Test System (BTS) iprovides test teams with the ability to respond to rapidly changing test requirements, pressing timelines, and limited resources.

Solution Overview:

- Flexible system architecture.
- Hardware abstraction layer.
- System simulation.
- Enterprise data and systems management tools for large scale deployments.

Key Benefits:

- Reduce Test Development and Configuration Times
- Out-of-the-box functionality
- Simplified test definition, implementation, and management.
- Standardized cycler, chamber, and other device/instrument interfaces.

BATTERY CELL PRODUCTION TEST

Manufacturing of safe, reliable, and top-performing electric vehicle (EV) batteries demands rigorous testing of the hundreds of battery cells and modules.

EV Battery Cell and Module Production Test Solution

• PXI provides the most compact and high-performance form factor.
• SMU for repeatable and precise measurement and current sourcing for AC-IR and weld integrity test.
• The digital multimeter (DMM) performs fast and precise voltage measurements for OCV and weld integrity test.
• Effectively scale the system to 32 or 64 channels for maximum coverage in a smaller footprint.
• Direct integration with production test software like TestStand, Switch Executive, and SystemLink™

Key benefits:

- Test speed.
- Cost-effectiveness.
- High throughput PXI configurations
- Scalability.
- Small footprint.
- Defined software.
- Service programs for maximum uptime.

2.

ELECTRIC VEHICLE TEST SYSTEMS: ENGINE, BODY, AND CHASSIS

SAAB RDS Flexible test systems reduce development time, increase test throughput and tester reuse, and ultimately reduce cost of test for powertrain, body, and chassis components.

ECU FUNCTIONAL TEST

ECU Test System (ECUTS) is a PXI-based configurable, out-of-the-box functional test solution that combines software, hardware, and services to ensure you reduce time and resource waste during implementation to meet your deadlines and time-to-market goals.

System Solution:

The system is a functional tester for end-of-line (EOL) test of automotive ECUs built on our adaptive, open technology. Our systems R&D engineers have integrated the following core components into this system, so you can focus your energy on implementing your test plan.

BODY AND CHASSIS ECU HIL SYSTEM

As vehicles become increasingly connected, automated, and electrified, the complexity and number of electronic control units (ECUs) within vehicles continues to grow, so new fast, accurate, and automated ways to systematically test functionalities are needed.

System Description

With our open flexible HIL solutions, you have the power to easily customize the test system to fit your specific needs. Using a modular architecture, you can easily upgrade the platform with added functionality to future-proof your test systems and meet the requirements of the most demanding embedded software test applications.
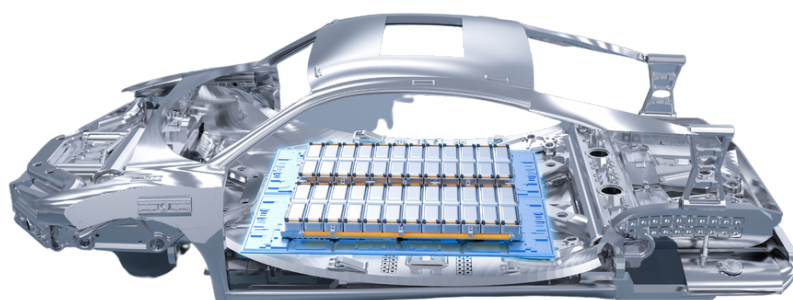
3.

CONNECTED CARS

Based on NI's RF and software-connected systems that rapidly adapt to evolving protocols and technologies related to connected cars

C-V2X CONFORMANCE TESTS

V2X (Vehicle-to-Everything) communications will transform the mobility industry to improve the safety and efficiency of vehicles and autonomous systems. In addition. V2X interfaces must conform to communication standards (such as 4G/5G cellular connectivity or 3GPP standard) and RF regulations, so a test system must adapt to changing standards quickly. A flexible and scalable test system is needed to implement validation test of those systems in production.
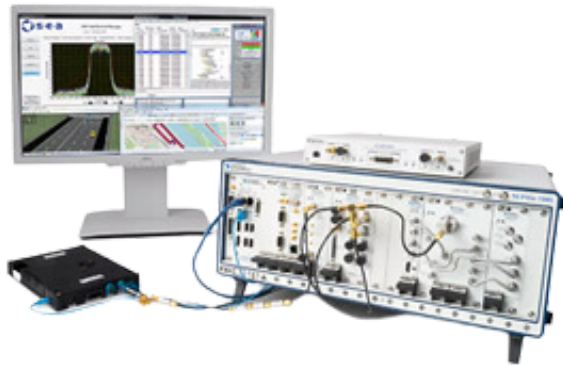
Turnkey solution with ready-to-run test catalogs for different standards. **Open software-defined architecture** and a **PXI** modular platform, combined with **VST** and **USRP** hardware

VEHICLE SYSTEMS INTEGRATION HIL

Systems integration testing, also called "full vehicle" or "network" hardware in-the-loop (HIL), ensures that engine control units (ECUs) across the vehicle in different systems, developed by different teams all function correctly and safely together.

🌱 Key benefits

• Save time and reduce costs by integrating Vehicle Systems Hardware-in-the-Loop Test into your validation process.

• Easy transition and reuse of components across subsystem and system-level HIL testing to full vehicle system testing.

• System reconfiguration with high-power and mixed-signal I/O capabilities.

• Open and flexible with a multivendor test environment: Python, CANoe software, and ASAM XIL-related components.

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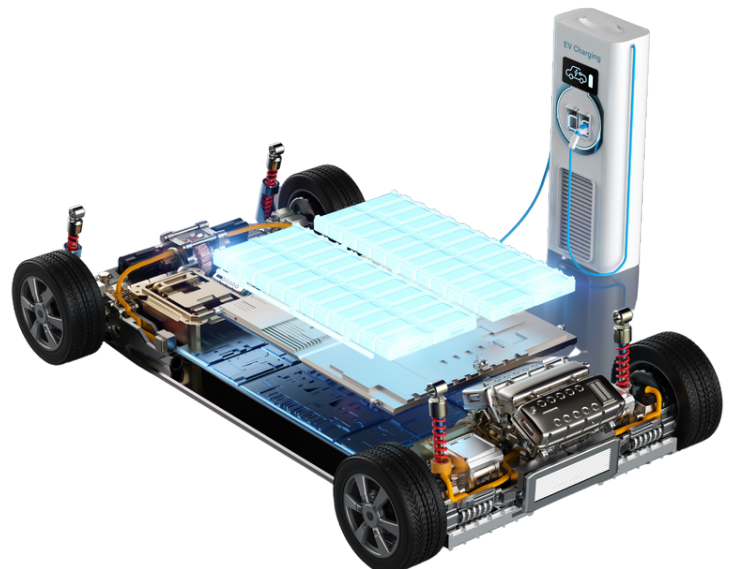
ELECTRIC DRIVE TEST

From model validation to field testing, and all phases in between, NI's expertise in optimization through model-based development and test asset reuse is key to accelerating EV drive validation
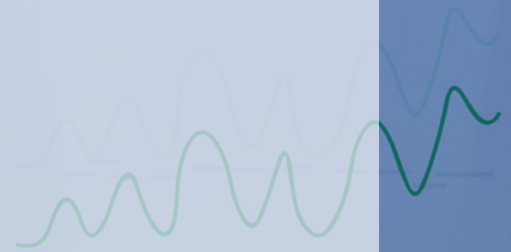
INVERTER TEST SYSTEM

The inverter plays a critical role in controlling the speed and torque of the electric motor, and it is essential to ensure that the inverter performs reliably and efficiently with a test system that simulates the operating conditions of the inverter in an electric vehicle

Solution Architecture:

• Built on **PXI Express** and Switch Load and Signal Conditioning (**SLSC**) hardware to provide a **modular** and **scalable** solution with tight synchronization

• **Real-time hardware-in-the-loop** (**HIL**) **model simulation**, control, and data acquisition through NI VeriStand application software.

• Integrate and run third-party electro-mechanical, battery, and vehicle models on Multifunction Reconfigurable FPGA hardware.

• Monitor your test fleet, view and analyze large test data sets, and deploy batch updates from any web browser using SystemLink™ software.
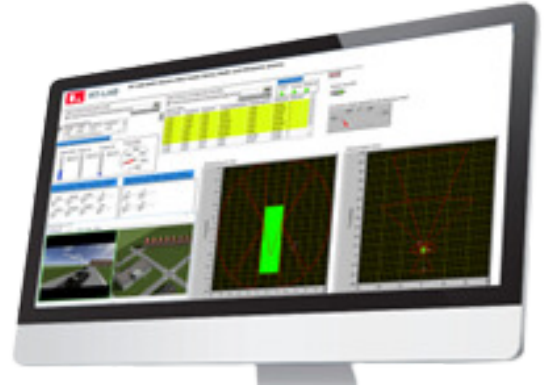
ONBOARD CHARGER TESTING

EV charging infrastructure is a system of stations that connects EVs or plug-in hybrids to a source of energy, allowing them to be recharged.
SAAB RDS partners have included this technology as a part of the xMove platform to enable simulation of the Electric Vehicle Supply Equipment (EVSE) to be used when performing functional testing of the vehicle.

◎ Solution Overview:

• Easily replace the charging plug unit on the test system for the actual requirement.

• The test system logs the CP data and measure the current/voltage between the vehicle and charger station.

• Due to the reconfigurability of the test system, it can easily be used on component, system or integration testing.

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