Hardware-in-the-Loop Add-Ons for NI VeriStand

Thank you for your interest in NI VeriStand real-time testing software. You can extend NI VeriStand to address application-specific requirements through the use of a modular plug-in framework. You can also customize nearly every component of NI VeriStand to ensure it always meets your application needs. Below are examples of NI VeriStand add-ons that are commonly used in automotive applications.

FPGA-Based Engine Simulation

The Engine Simulation add-on gives you the ability to test engine control units (ECUs) by simulating an engine. This includes generating cam and crank signals and capturing output events, such as those for fuel injectors and ignition coils. This add-on requires a compatible NI reconfigurable I/O (RIO) FPGA module.

Download FPGA-Based Engine Simulation

J1939 Communication Tools

The J1939 add-on gives you the ability to monitor and communicate with J1939-compliant devices on a CAN network. With it, you can read and write J1939 frames imported from a database, read active and previously active trouble codes, clear active and previously active trouble codes, claim and cache J1939 device addresses, send J1939 requests, and generate raw frames on the network.

Download the J1939 Communication Tools

Scan Engine and EtherCAT

The Scan Engine and EtherCAT add-on gives you the ability to easily read scanned I/O from NI C Series modules located in an NI CompactRIO or NI 9144 EtherCAT chassis. The add-on also supports custom FPGA personalities to be used with an NI 9144 chassis.

Download Scan Engine and EtherCAT Support for NI VeriStand

Automotive ECU Workspace Objects

The Automotive ECU Workspace Objects add-on includes a library of automotive-specific UI elements that give you the ability to dictate engine speed, drive PWMs, and ground channels.

[Download the Automotive ECU Workspace Objects](#)

XCP and CCP Master for ECU Calibration and Measurement

The NI ECU Measurement and Calibration Toolkit provides high-level, easy-to-use functions based on the Universal Measurement and Calibration Protocol (XCP) and CAN Calibration Protocol (CCP). Because of these protocols, you can read and write to internal ECU variables and characteristics as defined in ASAM (.A2L) database files. By using (.A2L) database files, the toolkit automatically applies all scaling information and returns data in engineering units for easy analysis, presentation, and logging. The toolkit includes a CCP and XCP Master add-on for NI VeriStand, which gives you the ability to calibrate your ECU directly from NI VeriStand.

[Explore the ECU Measurement and Calibration Toolkit](#)

FPGA-Based Electric Motor Simulation for Power Electronics HIL Testing

The NI Electric Motor Simulation Toolkit provides the modeling elements to develop hardware-in-the-loop (HIL) simulations of electric motor systems. The toolkit features an NI VeriStand add-on for the various motor simulation types, including switched reluctance motor (SRM) and permanent magnet synchronous machine (PMSM) motor types in a simple linear approximation or in a high-fidelity representation that integrates with JSOL JMAG-RT models. With the interface of the finite-element analysis (FEA)-based JMAG-RT models, you can accurately simulate highly nonlinear behavior such as cogging torque and magnetic saturation.

[Explore the Electric Motor Simulation Toolkit](#)