

Aliaro Solution Brief

Battery Management System (BMS) HIL Test

The ALIARO BMS HIL enable you to verify the battery management system (BMS) functions by emulating battery cells and simulating sensors, I/O, and communication to other DUTs. Ensure that your communication, safety functions, cell balancing, and fault monitoring algorithms are working properly. When testing the embedded software on these BMS, safety, availability, or cost considerations can make it impractical to perform the necessary validation tests using a complete system.

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 DUT design and test requirements change.

Application Requirements

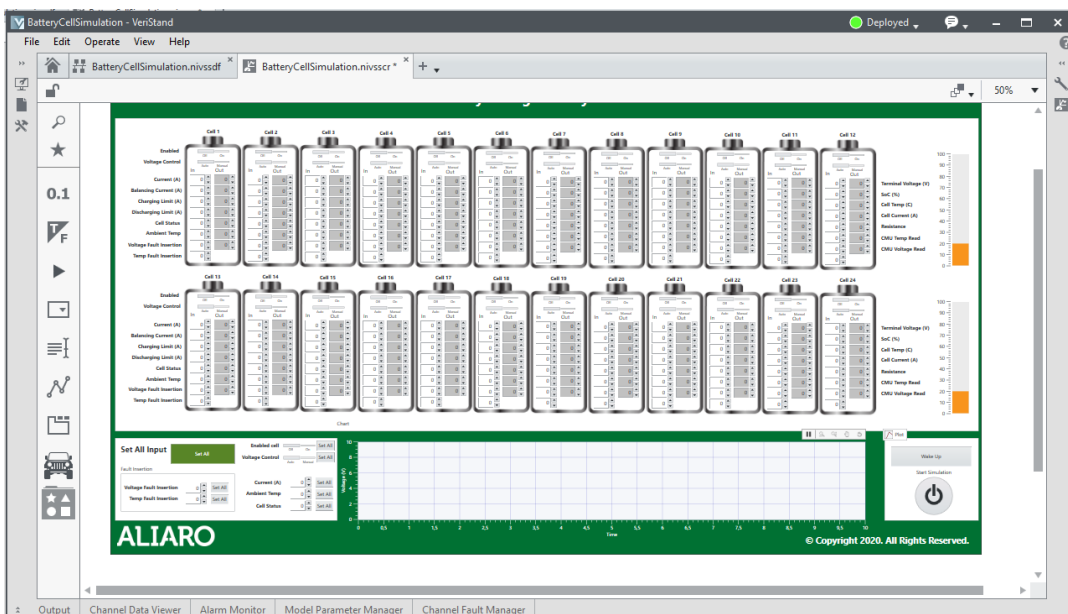
- Adapt to inevitable changes in signal lists and I/O requirements
- Emulate cells on battery models.
- Conduct fault insertion and signal conditioning on both BMS and general I/Os.

The 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.

ALIARO Solution

- If your DUT pinout changes you can quickly reconfigure your system setup using the xMove Configurator Software and the AL-1010/AL-1032 SLSC module, which provides flexible I/O, signal conditioning and switching capabilities on each channel, and fault injection on all pins.
- Emulate minimum 6 battery cells with a high-precision BCS unit connected to the system through the NI SLSC chassis. Easily add more channels.
- Integrate battery models configured to simulate most battery types with different discharge characteristics and execute real-time tests with NI VeriStand.



The NI and ALIARO Advantage

The combination of hardware and software from NI and ALIARO, results in a very competitive solution

The NI Real-time simulation system helps you develop end test products and designs in a safe environment.

NI and ALIARO combined technologies help you to simulate models of batteries, power electronics and motors.

Key Specifications

Area	Value
Re-configurable DUT I/O Functionality	Analog IN/OUT, Digital IN/OUT, PWM IN/OUT
Max Number of General I/O per rack	320 channels using AL-1032 SLSC modules
Thermistor emulation	>16 channels, using AL-3011 Thermistor Emulation SLSC modules (up to 8MOhm)
Electrical fault insertion	Yes, on all DUT channels
Support for fault insertion of buses	Yes, CAN, LIN, ISO-SPI, Automotive Ethernet
ASAM Support	Yes
Supported Simulation models in VeriStand	http://www.ni.com/product-documentation/31488/en/
Max Number of Cells for Emulation	204 (34 x 6 Cells per Cell Emulator) using AL-4010 SLSC modules
Available model templates	Demo models for simulating a vehicle electrical system with starter, alternator, battery and different electrical Loads using Mathworks SimScape
Optional hardware	Pre-charge chassis, DUT safety side-rack, exchangeable load boxes



About ALIARO

Aliaro is an established test solution & HIL provider and NI Silver Alliance Partner in Sweden with offices in Sweden, UK, India, China and USA. Together with NI, they design modular, flexible, and cost-efficient solutions for testing and HIL that enable customers to work with open and changeable devices where rapid changes are allowed.

Contact Aliaro to learn more about how NI & Aliaro can help you increase product quality and accelerate testing timelines.

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