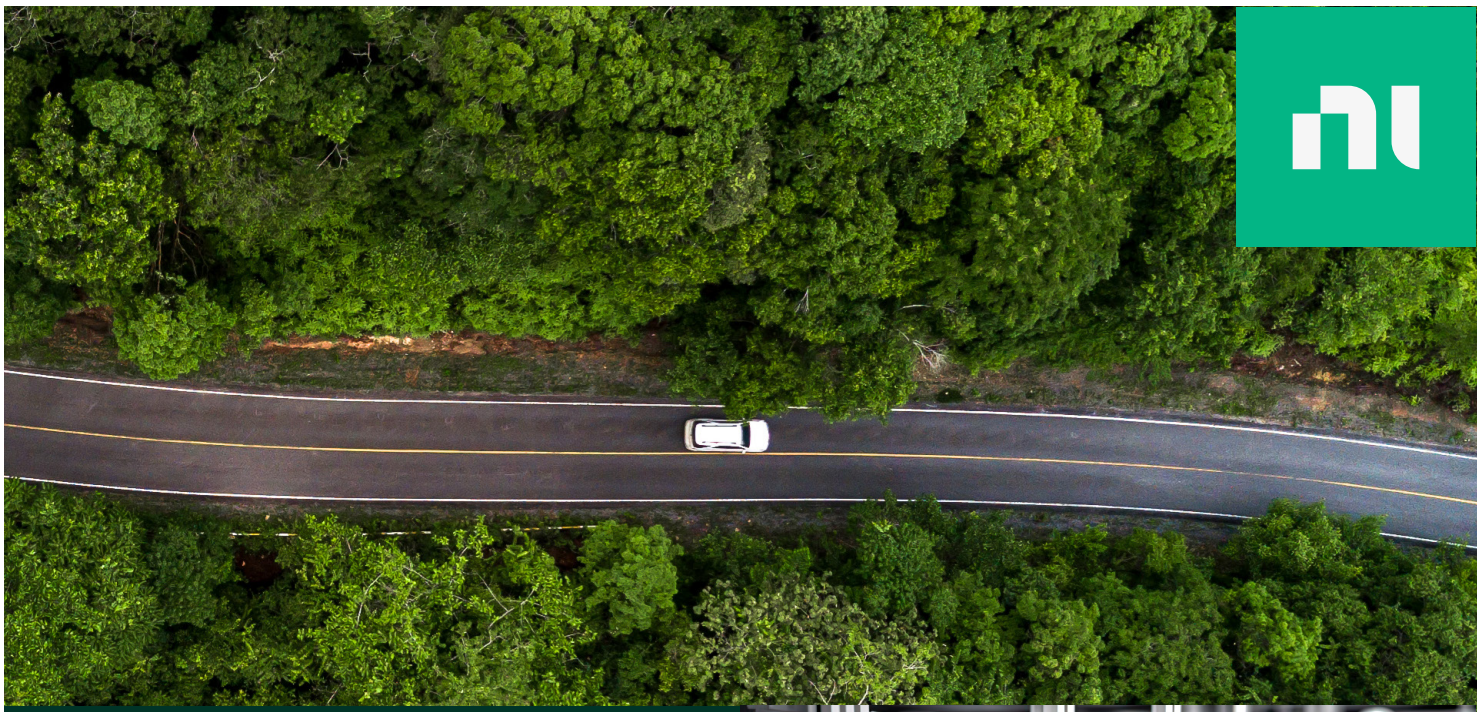
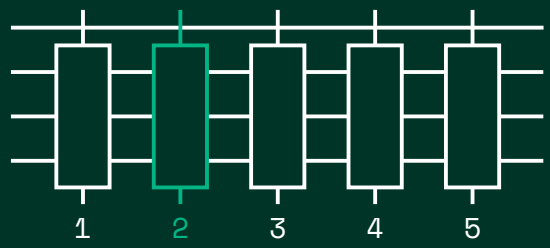




Solution Brochure

EV Battery Cycler and Emulator Portfolio

Future-Proof Battery Testing with Scalable Solutions

Explore NI's Solutions

03 Battery Cycler and Battery Emulator for Modules and Packs

NI's Pack-Level Battery Cycler and Battery Emulator Comparison

04 Modules and Packs

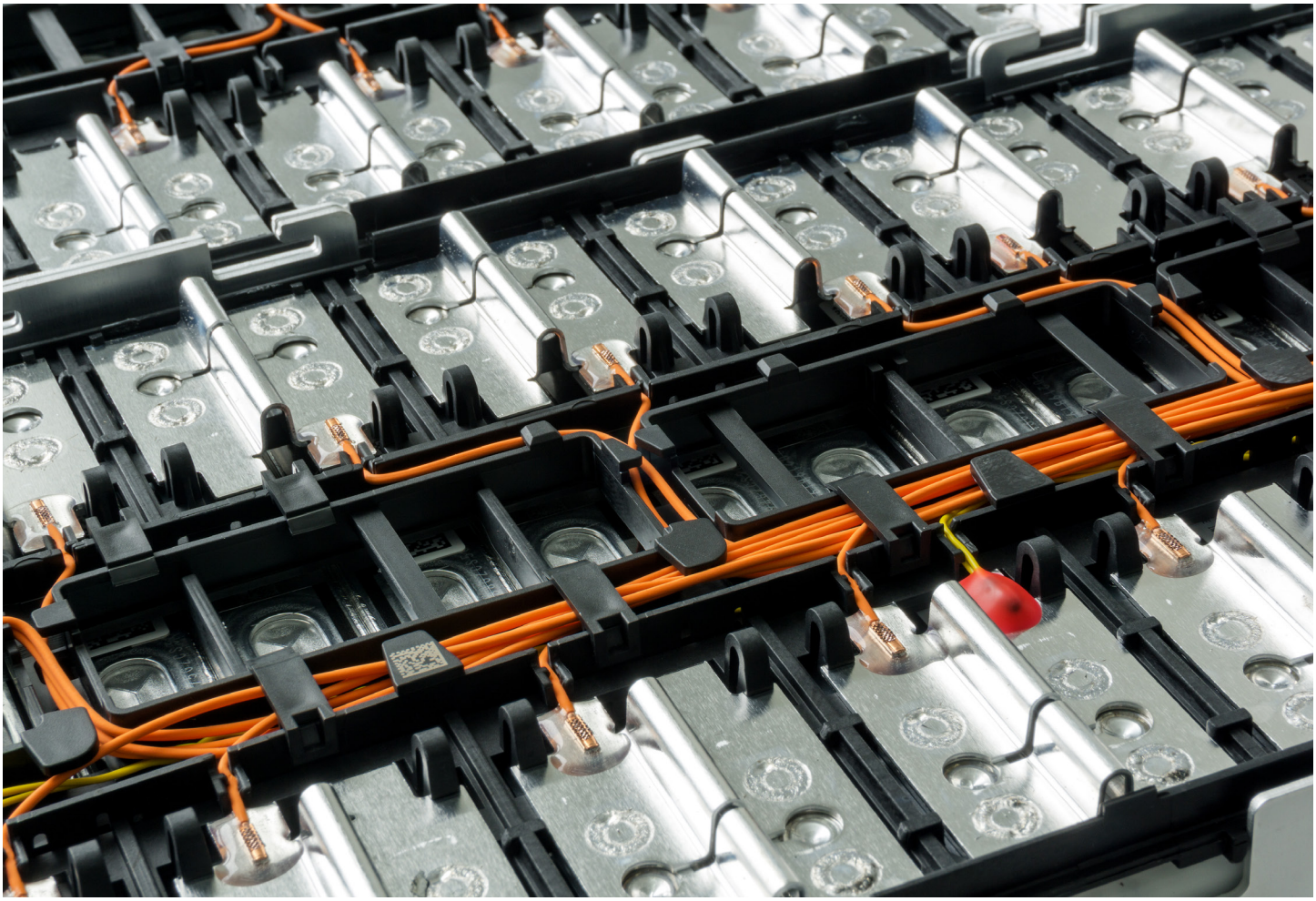
Pack-Level

Module-Level

NI's Battery Cycler and Battery Emulator Portfolio

06 The Software-Defined Lab

A Comprehensive Approach to Battery Test



Battery Cycler and Battery Emulator for Modules and Packs

NI's industry-leading battery cyclers are used by OEMs, top tier suppliers, and research labs worldwide. Our selection of cyclers cover a wide-range of conditions to meet your evolving needs.

We provide high performance, easy to use, safe, and reliable solutions for the entire battery product life cycle from R&D to production, end of life, and remanufacturing.

Whether you need a standalone tester or a fully integrated solution, our battery test experts are here to help with a scalable path forward.

Flexible and Scalable Power

Future-proof investment with expandable power and wide operating envelope.

Built-in Safety Features

Mitigate safety risks with pre-charge circuit, reverse polarity checker, isolation relays, emergency stop, and more.

High Performance Hardware

Optimize test and validation with fast transients while simulating real-world conditions.

NI's Software-Connected Approach

Scale your battery lab through NI's optimized data analytic workflows and enterprise lab management software.

PRODUCT	VOLTAGE LEVEL	FEATURED HIGHLIGHT	DYNAMIC RESPONSE	IGBT/ SIC	COOLING	CHANNELS/ UNIT	GRANULARITY	COST/ WATT	FOOTPRINT/ WEIGHT
ERS-BIC 80 to 600kW	600/1200V 600A to 1200A up to 2.4MW	Overload capability with fast recovery; IP-54 rated	Fast (ms)	IGBT	Water	Up to 4	Medium	● ○ ○	Large
NHR-9300 100kW	600/1200V 167A to 333A up to 2.4MW	Mobile and user-friendly; Expandable power; Easily reconfigurable	Fast (ms)	SiC	Air	Single	High	● ◐ ○	Small
HPS-17000 150kW	750/1500V 240A to 480A up to 1.5MW	High frequency test signal production; High serviceability	Very Fast (sub-ms)	SiC	Air	Single	High	● ● ○	Medium

FIGURE 1

NI's Pack-Level Battery Cycler and Battery Emulator Comparison

Modules and Packs

Pack-Level

80kW to 600kW per channel up to 2.4MW.

ERS-BIC Advantages

Overload Capability and Fast Recovery: Dramatically increase peak loads with overload capability up to 180% of power for 30 seconds (500kW system: 900kW overload).

High Power / Lower Cost: Expand power without linear cost increase.

Split Power and Multi-Channel Flexibility: Validate new pack designs with one or two output channels and three operation modes: single, parallel and series.

Rugged: Test confidently in production areas with IP 54 protection from heavy dust and dirt particles in industrial environments.

100kW up to 2.4MW.

NHR-9300 Advantages

Mobile and User-Friendly: Move hardware easily within facility with door-sized cabinets on wheels. Easily set-up, reconfigure, or service test stations efficiently and effectively.

Future-Proof Investments: Increase and split power incrementally at the cabinet level with 100kW power blocks.

Maximize Lab Space: Optimize lab layout and save floorspace with high-power density and small footprint.

Ease of Use: Quickly get started testing with pre-programmable pre-sets on large visual panel. Switch easily between low and high voltages through a software mode.

150kW up to 1.5MW.

HPS-17000 Advantages

Increase Battery Test Coverage: Test up to 1500V with high-frequency test signal production.

Layout Flexibility: Parallel Operation regardless of lab location via real-time synchronization ideal for large, distributed deployments.

Application Coverage: Test HIL applications for batteries, inverters, and dynamometer using time-stamped setpoint and measurement streaming at rates up to 100 kHz.

Increased Uptime: Swap out individual SiC-based power modules (PMSiC) for easy maintenance and high serviceability. Run the system safely if one power brick needs repair.

+/-1500V Differential Voltage Input.

BTS-16110 High-Voltage Battery Measurement Module

A network-based device that sits in the signal path between the battery and the cycler to provide guaranteed voltage and current measurement accuracy required for long-duration tests.

- +/-1.5kVDC, 1kVDC CAT O Isolation, Up to +/-2kA
- 0.006% + 10mV Typical Accuracy
- 0.03% + 100mV Guaranteed Voltage Accuracy
- 0.01% Reading Gain + 0.001% Range Offset Device Current Accuracy
- 0.01% Reading + 0.005% Range System Current Accuracy
- 2-Year Calibration Interval
- 1.25 MS/s Acquisition Rate
- Continuous Background Calibration During Test

Module-Level

40V, 120V - 12kW up to 144 kW

NHR-9200 Advantages

Highly Flexible Configurations: Parallel up to 21 power modules that can test multiple batteries with different parallel configurations, test programs, and start/stop times.

Mobile and User-Friendly: Move hardware easily within facility with door-sized cabinets on wheels. Easily set-up, reconfigure, or service test stations efficiently and effectively.

Ease of Use: Quickly get started testing with pre-programmable pre-sets on large visual panel.

80V, 16.5kW up to 165kW

NHR-4800 Advantages

Versatile, Compact, and Fully Integrated Battery Cycler: Built-in isolation contactor relays, pre-charge circuit, reverse polarity checker

Auto-Ranging Operating Envelope: A very wide operating envelope with higher current and power capability to meet your testing needs.

Maximize Lab Space: This truly versatile device with integrated safety features easily replaces multiple instruments in the laboratory and reduces fixturing.

PACK-LEVEL		10KW	100KW	500KW	1.0MW	1.5MW	2.0MW
NHR-9300 600/1200V 167A to 333A		1CH @ 100kW PARALLEL UP TO 2.4MW					
HPS-17000 750/1500V 240A to 480A		1CH @ 150kW PARALLEL UP TO 900kW PARALLEL UP TO 1.5MW					
ERS-BIC 600/1200V 600A to 1200A		4CH @ 160kW, 250kW, 325kW, 400kW, 500kW, 600kW 2CH @ 160kW, 250kW, 325kW, 400kW, 500kW, 600kW 1CH @ 250kW, 325kW, 400kW, 500kW, 600kW PARALLEL UP TO 2.4MW					

MODULE-LEVEL		10KW	100KW	500KW	1.0MW	1.5MW	2.0MW
NHR-9200 40V/600A 120V/200A		1CH @ 12KW 3CH @ 36KW PARALLEL UP TO 144kW					
NHR-4800 80V/400A		1CH @ 16.5KW PARALLEL UP TO 165kW					

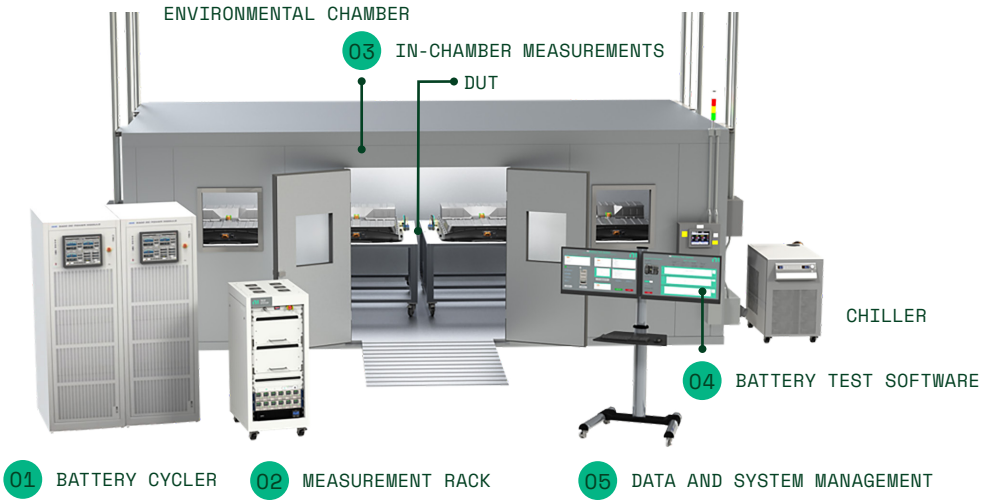
FIGURE 2

NI's Battery Cycler and Battery Emulator Portfolio

The Software-Defined Lab

A Comprehensive Approach to Battery Test

We're revolutionizing how enterprises use battery test and data insights to drive product and business performance. Scale your battery lab through NI's optimized workflows, enterprise lab management software, and integration partners.



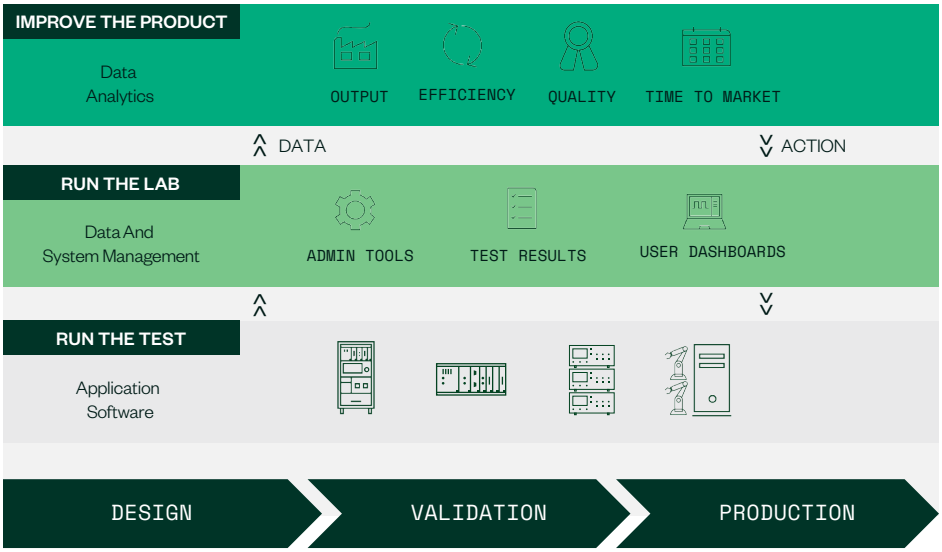
01 Connection to power electronics, less rework

02 Scalable measurements at low cost per channel

03 Rugged in-chamber measurements

04 Open, out-of-the-box or custom battery test software

05 Customized data dashboards for facility management



- Automate and Streamline Workflows
- Connect and Increase Utilization of Test Systems
- Enhance Data Management and Analysis

System Integration on Your Terms

NI offers a variety of solution integration options customized to your application-specific requirements. You can use your own internal integration teams for full system control or leverage the expertise of our worldwide network of NI Partners to obtain a turnkey system.

Contact us to learn more about how NI can help you increase product quality and accelerate test timelines.

Contact us

NI Services and Support

- Consulting and Integration
- Global Support
- Turnkey Solution Delivery and Support
- Prototyping and Feasibility Analysis
- Repair and Calibration
- Training and Certification

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