Electric Flight Test Solutions
*Full & Hybrid-Electric Planes, E-VTOL, Flying Taxis, Drones*

Components & systems:
Batteries, electric propulsion & power electronics

NH Research (NHR)
*Enabling Electrification*
Enabling Electrification

NHR enables electrification by accelerating innovation, validation & functional test of today’s & tomorrow’s technologies.

Backed by over 50 years of experience

- Best in class performance
- Ease of use
- Modular & scalable solutions
- Reduced testing time
- Improved safety
- Energy savings
World-Class Test Solutions

Flexible, Modular Hardware AND Software

Product Portfolio

- Battery/Fuel Cell Test Systems
- Bi-directional DC Source
- Grid Simulators
- AC & DC Electronic Loads
- AC & DC Power Sources
- Power Supply Test Systems

...Your Partner in Test
Electric Flight

- Commercial Airplanes
- Military & Defense
- eVTOL
- Drones
- Flying Taxis
- Batteries, Fuel Cell, Propulsion

…and more!
“The Grid” Revolutionizes Electric Aircraft

Advanced, High Power R&D Lab

NHR provides high voltage DC power farm

Read the Press Release
Aerospace & Defense
ATE-friendly and next generation power test solutions from R&D to sustainment

Complete Avionics Test Solutions
1. Batteries, capacitors
2. Propulsion system
3. AC-DC, DC-DC converters
4. AC generators
5. Auxiliary loads, switches, electric actuators, etc.

Electric Flight Test Solutions
- Battery Test Systems
- Grid Simulators
- AC & DC Electronic Loads
- Bi-directional Sources
- AC & DC Power Sources
- Power Supply Test Systems
Electric Flight Power Test Solutions

- High Voltage Battery
- Propulsion
- Primary/Secondary PDU
- DC-DC Converters
- Electric Actuators
- Inverter

Example: e-VTOL (Electric Vertical Take-off and Landing)
High Voltage Battery Tester

NHR’s 9300 and 9200 Battery Test Systems enable scalable power and flexible configurations for life-cycle, drive cycle & performance testing.

9300 Series - 100kW modules up to 2.4 MW, Dual range (600 V, 1200V)
9200 Series - 12kW modules parallel up to 21 channels

- Modular & scalable power
- Fast response times
- Built-in safety isolation relays and contactors
- Easy third-party integration & data management
- Optional test system software available
Full Electric Propulsion

NHR’s 9300/9200 battery emulators can be used to emulate a high voltage battery and the DC Buss, ideal for electric propulsion testing.

9300 Series - 100kW modules up to 2.4 MW, Dual range (600 V, 1200V)
9200 Series - 12kW modules parallel up to 21 channels

- Accepts back EMF ensures accuracy & prevents safety hazards
- Battery emulation sinks & sources to maintain voltage regulation
- Built-in safety isolation relays & contactors
- Easy third-party integration & data management
- Optional test system software available
Parallel Hybrid Electric
Electric motor provides rotation and supports the combustion engine for peak performance.

Serial Hybrid Electric
Combustion engine used to generate electrical energy to charge a battery or run the electric motor
The NHR Approach accepts back EMF and prevents safety hazards. Isolated input and output paths eliminates single points of failure.
Power Distribution Units

NHR provides safe solutions for testing PDUs which route multiple high power sources and loads throughout the aircraft.

- Modular power configuration & flexibility
- Fast transient capabilities
- Built-in safety isolation relays and contactors

Bi-directional DC Source for Battery Emulation

- 9300 Series - 100kW modules up to 2.4 MW
- 9200 Series - 12kW modules

DC Load for transient load inrush simulation

- 4700/4760 for 120VDC & 600VDC
- 9200/9300 Series - Regenerative > 90%

AC Sources/ Loads

- 9410 Grid Sim/ 9420 AC Source
- 9430 Regenerative 4 Quadrant Load

Primary & Secondary Power Distribution Units
Aircraft Electrical Power Systems

NHR’s DC loads are ideal for multi-channel load testing while NHR’s 9300/9200 bi-directional DC source can be used to emulate the PDU power source.

**DC Load** for transient & accessory load inrush simulation
- **4300 Series** – 120VDC & 500VDC
- **4700/4760** – 120VDC & 600VDC

**Bi-directional DC Source** for Battery Emulation
- **9300 Series** - 100kW modules up to 2.4 MW
  Dual range (600 V, 1200V)
- **9200 Series** - 12kW modules
  Parallel up to 21 channels
Aerospace & Electric Aircraft Test Solutions

9430 Regen
4 Quadrant Load
up to 96kW

4600 AC Load
up to 36kW

9410 Grid Sim
up to 96kW

9420 AC Source
up to 96kW

9200 Series
12 kW, 21 channels

9300 Series
100 kW to 2.4 MW

9410 Grid Sim
up to 96kW

9420 AC Source
up to 96kW

9200 Series
12 kW, 21 channels

9300 Series
100 kW to 2.4 MW

4300 Chassis
150W, 300W, 600W

4700 & 4760
1kW to 36kW

AC Grid Sim
AC Sources
- 9410
- 9420

AC Loads
- 9430
- 4600

Bi-directional DC Source
Battery Emulators
- 9200 Series
- 9300 Series

Battery Test
- 9200 Series
- 9300 Series

DC Loads
- 4300
- 4700/4760

DC Regenerative Loads
- 9200 Series
- 9300 Series
Access Resource Library

- Download Application Notes
  - Electric Aircraft Test Solutions Guide
  - Battery Emulation: Testing without Batteries

- On-Demand Webinars

- Schedule a Consultation

- Electric Aircraft Test Solutions Webpage

- Visit us at http://nhresearch.com
Worldwide Service & Customer Support

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- **Expertise** – application, product design, engineering specialists on stand-by
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- **Support** – technical experts, training, diagnostic/calibration tools, and replacement parts to resolve problems quickly

“At NHR, we consider every customer a **partner**.”

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