



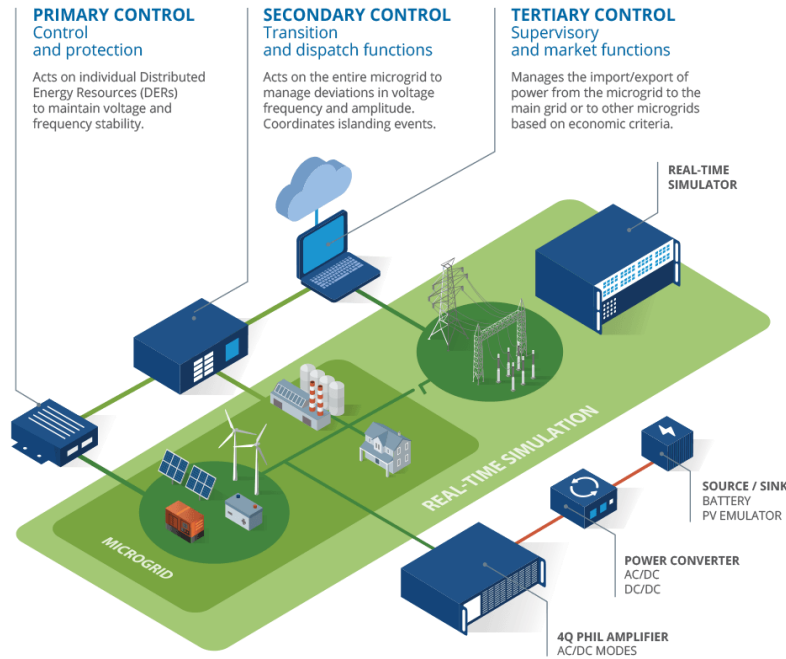
Partnership . Differentiation . Innovation

OPAL RT

Microgrid solution



Partnership . Differentiation . Innovation



Hardware-in-the-Loop (HIL) Testing

Power Hardware-in-the-Loop (PHIL)

Real Power to Test Microgrid Applications

Quickly bring real-time simulated microgrids to the real world and extend their power busses into the lab to connect and test real power devices with Power Hardware in the Loop (PHIL). Don't know where to start? No problem. Each OP140 Real-Time Microgrid PHIL Test Bench comes with a validated generic microgrid model, detailed DER models and a generic microgrid controller, readily configured for PHIL emulation.



Trustworthy

Made to ensure closed-loop stability, accuracy and high bandwidth PHIL.



Turnkey

Save time and money with an intuitive, ready-to-use solution.



Safe

Turnkey PHIL systems designed with user safety in mind.

OPAL RT -HYPERSIM

Real-Time Simulation for the Power Systems of Tomorrow



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Academia	Manufacturers	Research Laboratories	Utilities



SOFTWARE COMPATIBILITIES	SIMULATION MODES	SOLVERS & TOOLBOXES	MODELS	MODELING COMMODITIES	I/O CAPABILITIES	REAL TIME VISUALIZATION	TESTING COMMODITIES	TEST AUTOMATION

OPAL-RT

Simulator Platform



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OPAL-RT offers a wide range of simulator platforms to meet all current industry needs and forthcoming challenges. All simulators are based on a modular and flexible design, and are fully customizable and expandable for specific I/O requirements.



OP4512

Compact Entry-Level Simulator

Performance



CPU Model Size



FPGA Model Size



Scalability



OP4610XG

Compact Mid-Range Simulator

Performance



CPU Model Size



FPGA Model Size



Scalability



OP5705XG

Versatile Real-Time Simulator

Performance



CPU Model Size



FPGA Model Size



Scalability



OP5707XG

Flagship Real-Time Simulator

Performance



CPU Model Size



FPGA Model Size



Scalability



OP5033XG

Brute Force Computing

Performance



CPU Model Size



FPGA Model Size



Scalability



OPAL RT –User Conference Papers



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A large graphic for the RT 22 conference. It features the text 'RT 22' in a large, bold, dark blue font. Below it, the words 'ENERGIZING' and 'TOMORROW' are stacked in a smaller, bold font, with 'TOMORROW' in green. To the right of the text are two thick, dark blue horizontal arrows pointing to the right. The entire graphic is set against a green background with a subtle pattern of overlapping circles and is enclosed in a dark blue rectangular border.

RT 22
ENERGIZING
TOMORROW

October 18-21, 2022 | Montréal



Functional Testing – High Power Testing System



NHR's product portfolio ranges from power instruments to complete test system solutions.

- AC & DC Electronic Loads
- Grid Simulators
- Bi-directional Sources
- Battery Test & Battery Emulation Systems
- AC & DC Power Sources

Renewable Energy | Microgrid

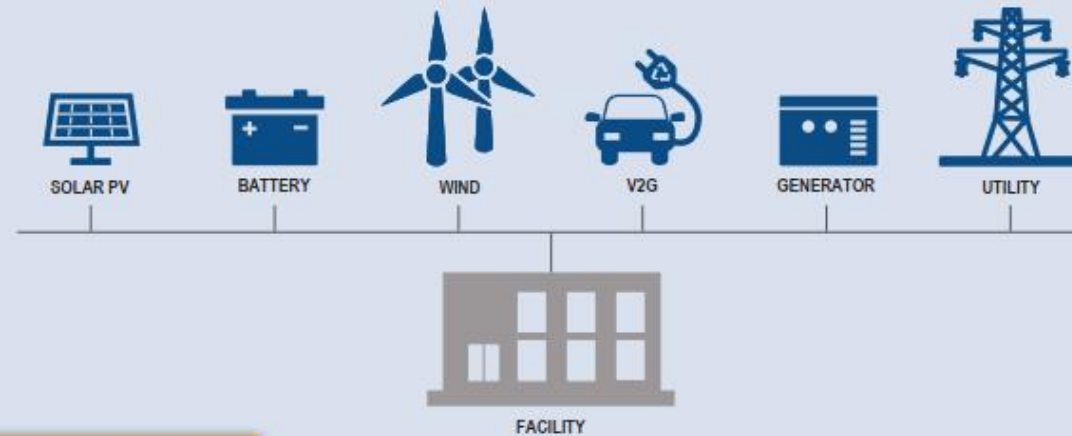
Renewable energy test solutions for solar PV, grid-tied technologies & energy storage systems



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Microgrid Test Solutions



[Learn More](#)

Example Test Applications



Grid-tied Technologies

- Distributed generation (DG)
- V2G, ESS
- High power wireless
- EV load testing



Grid Simulation

- ESS
- Microgrid



Solar PV

- Solar PV emulation
- Battery emulation
- PV Inverter



Energy Storage System

- Battery, fuel cell test



Power Conversion

- AC-DC, DC-DC converter
- UPS - Power Distribution Unit

BMS HIL – Battery Cell Simulation



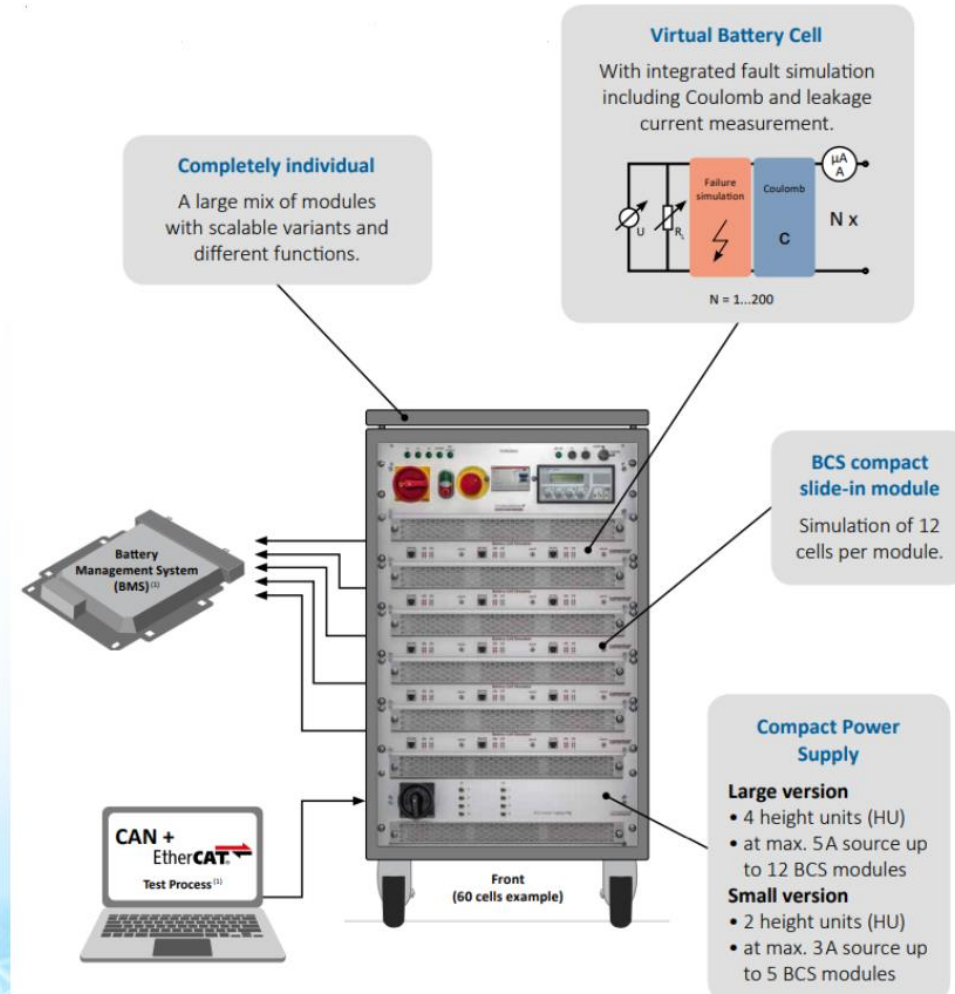
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Larger testing capability with:

- Temperature simulation using NTC/PTC
- High voltage isolation testing
- Extended fault simulation
- Active and passive balancing

Full cell emulation allows for the testing & validation of:

- BMS controller(s)
- Load
- Charger
- Etc



Thank You!

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