How to Perform Battery Emulation

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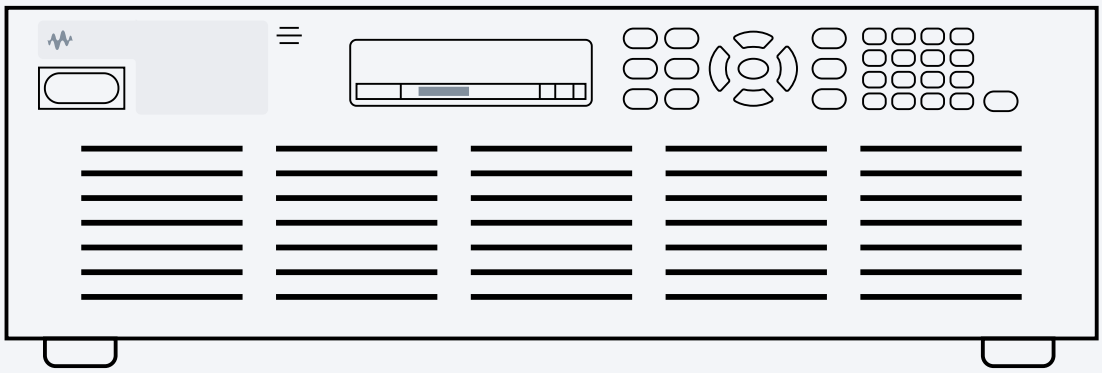
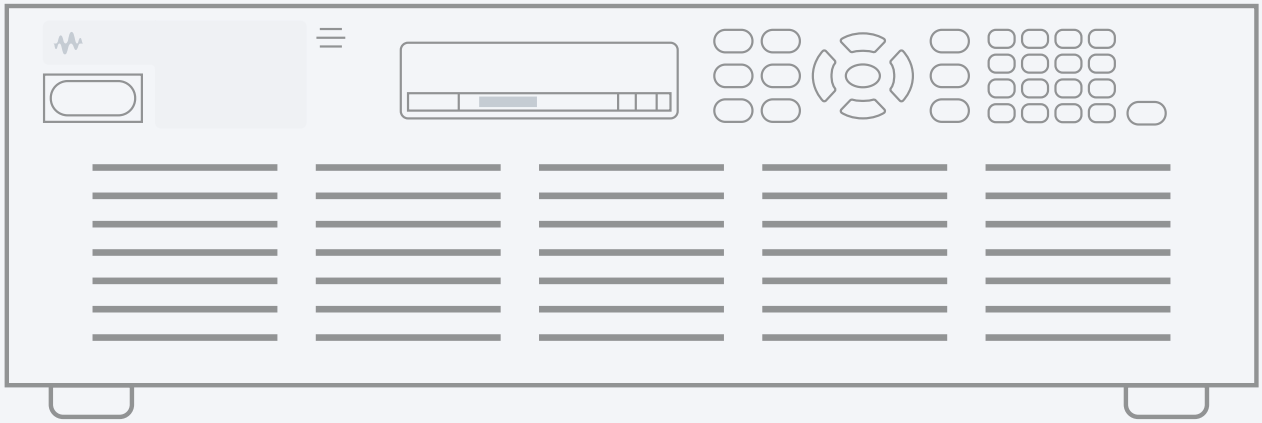


+ Regenerative ATE System Power Supply



+ Regenerative ATE System Power Supply

Evaluate Various Battery Performance Characteristics

In energy storage design validation, battery emulation is a critical process that uses a regenerative power supply and automation software to imitate the performance of a real battery. Battery emulation enables the testing of power components, such as chargers and inverters, safely and efficiently without the need for a physical battery pack. A bidirectional power source can act as a source current, like a battery being discharged, and a sink current, like a battery being charged, or a solar power supply. This dual functionality is essential for mimicking the power flow in an energy storage system.

Automated battery emulation software creates a virtual battery model by defining key parameters like voltage, capacity, internal resistance, and state of charge (SOC). The software then sends real-time commands to a regenerative power supply, instructing it to output a specific voltage and current profile that precisely replicates the behavior of the modeled battery. This setup enables a wide range of tests to be conducted with speed and repeatability across different battery types, under various SOC levels, or different environmental conditions. This approach not only enhances safety and reduces test time but also provides highly accurate and controlled test results, accelerating the development of new energy storage technology.

Battery Emulation Test Solution

Emulating a battery's electrical characteristics requires a bi-directional regenerative power supply and automated battery emulation software. The Keysight regenerative power supply and automation software can be used to emulate energy storage batteries by imitating a battery's electrical characteristics, such as

voltage, capacity, internal resistance, and SoC from the front panel The automated battery emulation software generates and imports custom battery models, enabling a wide range of test scenarios without the time-consuming process of charging and discharging a real battery. This provides an efficient method for validating the performance of devices connected to the emulated battery.

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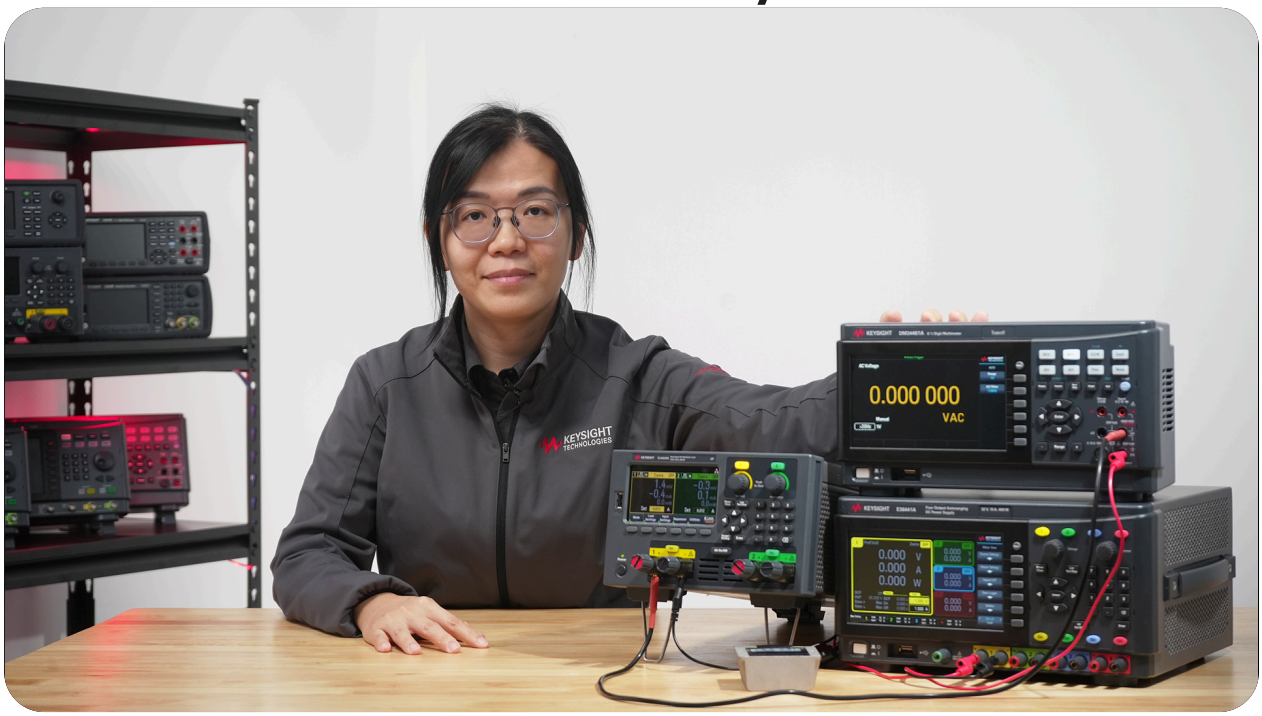
See Demo of Battery Emulation



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Emulation Test Solution

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RP5943A Regenerative DC Power Supply,...

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Additional resources for battery emulation

Datasheet

Regenerative DC Power Supplies

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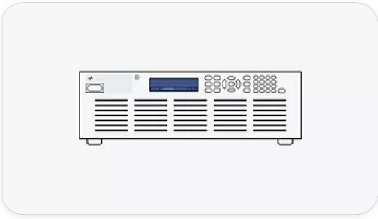
Related Use Cases

See All Use Cases

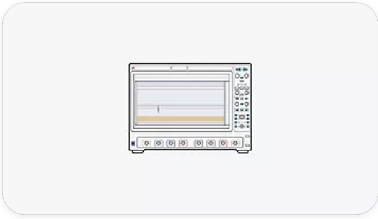


Stage 4: System Validation

How to Perform Battery Cycling

Battery charging and discharging can be done using a single device. Learn to efficiently cycle batteries using a regenerative power supply.

Learn More →



Stage 3: Compliance Test

How to Test 1.6T Electrical Transmitter Conformance

Validating 1.6T transceivers for data center applications requires precise electrical transmitter testing. Learn how high-bandwidth oscilloscopes help validate IEEE 802.3dj and OIF-CEI-224G compliance for electrical interfaces.

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Stage 3: Compliance Test

Test Your USB 2.0 Interface

The Keysight USB2.0 Compliance Test Solution is the automation test solution that allows users to test equivalent to the official USB compliance test in own lab easily.

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