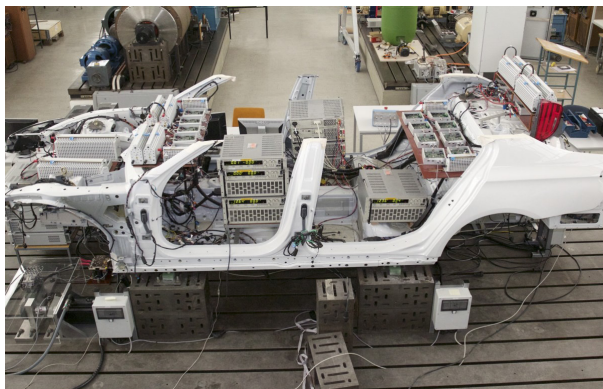


Customer Application #12

Battery Emulation with NL Source-Sink

The power demand in the vehicle electrical system has increased significantly in recent years. New approaches for an energy and power management are necessary to ensure the safe and efficient operation of the electrical system. For the validation of new methods an automotive power net test bench, consisting of a real car body with the original wiring harness, is used at the Department of Energy Conversion Technology.



Batteriesimulator bestehend aus der Echtzeiteinheit und den elektronischen Quellen/Senken NL1V20C340 (20V/ \pm 340A).

This application report was produced in association with TU Munich.

The electrical consumers of the power net are represented by physical models (modeled in modelling language Modelica).

The physical models are executed on a real-time system and the calculated current of the model is set by electronic loads from H&H. This process is also called emulation. In this application, an approach for battery emulation is presented. Especially in long-term experiments real batteries are quite problematic, since their state of charge is often not precisely known and the electrical behavior of batteries varies due to aging and temperature change.

The system is integrated in a mobile cabinet, so it can be easily connected to various points of the power net test bench. Moreover, it is not only used for battery simulation but for all systems that interact as a source-sink to the 12 V power net, such as bidirectional DC/DC converters, active supercapacitors or flywheel energy storages. For the emulation of 12 V lead-acid or Li-Ion batteries very powerful sources-sinks are needed since the processes in the batteries are very dynamic.



The NL series source-sinks are four-quadrant power supplies for the practice-oriented usage in laboratory, production and quality assurance. The linear-controlled source-sink is therefore a voltage and current source as well as a current sink combined in one device.