NEW: Electric Test Bench
High-voltage power hardware-in-the-loop
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High-voltage power hardware-in-the-loop

**Highlights**

- Testing electric motor controllers including power electronics with emulated motors and accurate real currents
- Modular hardware for different applications and special application topologies
- Turn-key test bench concepts for a wide range of electromobility applications

**Application Areas**

Hardware-in-the-loop (HIL) systems from dSPACE provide highly dynamic emulation of electric motor and battery components with several hundred kilowatts of power and voltages up to 800 V. All drive components of hybrid and fully electric drives can be represented with a real energy flow. The smaller systems based on the DS5380 and DS5381 modules are also suited for emulating and testing ECUs with low voltages of up to 60 V.

These power hardware-in-the-loop (PHIL) capabilities make dSPACE a unique provider of single-source, ready-to-use simulation solutions for the complete range of electric vehicle drives.

Typical applications are dynamic tests at power level of

- Automotive motor controllers
- Industrial servo controllers
- DC/DC and AC/DC converters

These applications can be used in a variety of test scenarios:

- Functional tests
- Load test (burn-in, end-of-line, controlled fault conditions)
- Test of controller robustness (motor parameter variation)
- Test of critical operation conditions

An open (Simulink®/Xilinx®) library from dSPACE provides the required simulation models, from FPGA models for motors, XSG Electric Components Models, and position sensors to the dSPACE Automotive Simulation Models (ASM) for batteries and complete powertrains.

**Key Benefits**

The high-voltage load setup based on the new DS5385 modules features a compact and modular design. The compact units can be used flexibly with regard to currents per phase and number of phases as well as the type of voltage source to be emulated. The system’s scalability allows for a combination of multiple high voltage cabinets to further increase the test system’s power. Using the same hardware for the emulation of loads, such as electric motors, and sources, such as batteries, makes the systems cost-effective and easy to maintain. The energy flow in the system circulates without complex grid feedback, leading to high efficiency and minimum load on the mains supply.

**Unique Features**

- Specifically tailored for HIL simulation at power level
- Efficient operation thanks to a circular energy flow without energy recovery to the mains: power supply requires only 20% of emulation power
- Water-cooled high-voltage power electronics for user-friendly environment conditions
- Current-based emulation for simulating variable motor inductances without the requirement for switching or exchanging any hardware components
- High power density per emulation rack, leading to a small overall system footprint
- Identical open simulation models for tests on signal level and power level
- Safe test conditions due to safety mechanisms for power electronics
- In-house development of hardware and software by dSPACE, resulting in a turn-key system from one provider