

SET Power Systems

is a member of the AVL Group and a leading global supplier of inverter testing systems. Our main focus is on smart power electronics that operate at very high switching speeds and thereby provide close-to-analog amplifier characteristics. We have established a new testing method that was used in 2003 for the first time: a virtual electric motor replaces the conventionally required mechanical loading system, thus providing a complete testing environment in a lab. Since then, the testing tool “virtual e-machine” has been perfected and is now available to our customers as a closed power-hardware-in-the-loop-solution (P-HIL). The testing scope ranges from auxiliary units to high-performance drive inverters.



Drive Inverter Testing

is one application for high speed switching amplifiers. Today, drive inverters for electrical motors have demanding requirements on functionality and safety – which must be tested in a close-to-reality environment. The core of our inverter test system is the e-machine emulator that reproduces the function and dynamic behaviour of a real electric motor in realtime using mathematical models.

These test systems have been designed to be extremely flexible in order to cover a large variety of tests for a wide range of inverters and converters. The power spectrum ranges from approximately 10 to more than 400 kW with voltages of more than 900 V and currents of up to 1.200 ARMS.

Our Virtual E-Machine

is a “game changing technology” for drive inverter testing. E-machine emulation (EME) technology is an elegant way to bypass the “mechanical world” used to test inverters. Wherever an electric motor is used to test drive inverters, EME technology demonstrates convincing advantages. This solid-state e-motor has no rotating parts and no mechanical limitation. Inverter testing with a virtual e-motor replaces heavyweight mechanical setups with real motors and dynamometers.

Improved Test Methodology

for inverters is one outcome of the virtual e-motor technology. The e-motor emulator is a Power-Hardware-in-the-Loop system that permits test methodology to be run according to the new functional safety regulation ISO 26262.

Close-to-Reality

is the design target for an e-motor emulator. SET Power Systems specializes in high dynamic amplifiers, high-speed instru-



mentation and high fidelity motor models to provide realistic e-motor characteristics over the complete operational range.

No Mechanical Limitation

is the obvious advantage of the emulator technology, which allows:

- Extremely high dynamics
- Excellent fault stimulation
- Motor change via software

A Wide Range of Test Applications

has already been addressed:

- Auxiliary ECUs
- Powertrain inverters
- Industrial inverters
- Aerospace inverters
- High speed inverters
- Formula 1 KERS

