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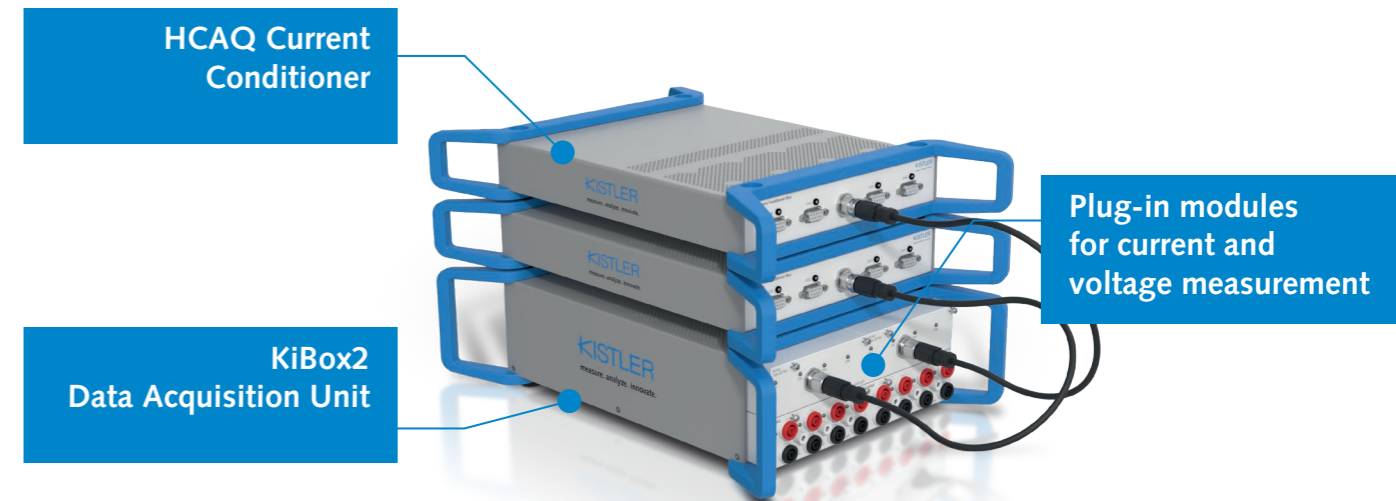
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# KIBOX2 E-POWERTRAIN ANALYSIS



## Compact power analyzer for evaluating electric and hybrid powertrains

KiBox2 is a compact, mobile, and versatile data acquisition system designed for comprehensive evaluation of electric and hybrid powertrains – from individual components to full electric and New Energy Vehicles. It delivers real-time measurement, recording, and visualization of all relevant propulsion parameters, with advanced cycle detection and ultra-fast calculation windows enabling highly dynamic and precise test procedures.

Equipped with scalable measurement channels and powerful processing capabilities, KiBox2 captures both input and response signals across the entire drivetrain. Its integrated software supports detailed visualization and analysis of application-specific e-machine data. Designed for maximum flexibility, KiBox2 is suitable for both in-vehicle and testbed applications – making it a single, unified solution for multiple drivetrain configurations.

## System features that benefit you



**Comprehensive concept**  
Complete solution for NEV powertrain analysis – from components to axis and full drivetrain



**Direct HV measuring**  
Hardware designed for direct measurement of HV signals



**Real time data delivery**  
Delivers raw- and time synchronized data in real time



**Static and dynamic test scenarios**  
Supports static as well as highly dynamic test scenarios (1/4 period calculation window)

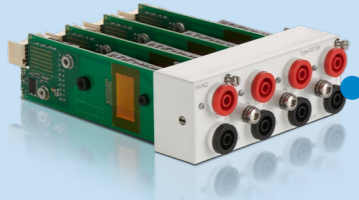


**Highly scalable**  
Scalable channel count (up to 64 channels, cascable hardware)



**Analysis of mechanical signals**  
Measurements and analysis of electric and combustion engines combined with mechanical signals from torque systems

## System components



### HVAQ 4-channel high voltage module

Galvanically isolated voltage module with measuring ranges up to  $\pm 1000$  Vrms /  $\pm 1500$  Vpeak. Safety level 1000V CAT II / 600V CAT III.

**HCAQ 4-channel high current module**  
Measurement ranges up to 2000 A are achievable thanks to the Current Conditioner Box, which enables the use of external zero-flux current transducers.



### KiBox2 16-channel DAQ unit

Compact and mobile power analyzer for electric and hybrid drives, offering real-time measurement, calculation, and visualization with precise cycle detection and fast processing 2.5 MS/s per channel.

## Supporting the whole development process

The KiBox2 Power Analyzer is engineered to support every stage of the development process – from integration and calibration to verification and optimization. Understanding electrical power flows is crucial for analyzing energy consumption in electric vehicles. When combined with Kistler or compatible third-party in-vehicle torque measurement systems, the KiBox2 enables a detailed and comprehensive analysis of energy flows under real-world driving conditions.

Mechanical signals from a torque sensor can be transmitted to the KiBox2 via analog or digital inputs. These signals are then used for internal calculations and efficiency analyses, whether at the component level or across the entire drivetrain. Users can leverage predefined generic calculators or integrate custom logic and algorithms for real-time execution during measurements.

By incorporating mechanical input, KiBox2 significantly expands the scope for analyzing and innovating electric drivetrains – offering deeper insights and greater flexibility in the pursuit of performance and efficiency.



## Full testbed integration guaranteed

The full system can be effortlessly installed or integrated into testbeds.

Compact design, seamlessly integrates with test stand automation systems

- 4-in-1 solution, replacing:
  - Oscilloscope
  - Power analyzer
  - Current transducer supply
  - Resolver/encoder signal conditioner

- Comprehensive communication support:
  - Ethernet, WLAN
  - CAN, CAN-FD
  - DCOM, XCP, PTP (master & slave)
  - Remote API



## Post processing with jBEAM Powertrain

For post processing, KiBox2 integrates seamlessly with jBEAM, enabling advanced visualization, reporting, and calculation. Engineers can easily create customized displays for standard procedures, apply centralized styling for consistent reporting, and perform detailed calculations on recorded data, unlocking new insights and supporting efficient, data-driven development.

- Read in data of Cockpit file formats (.open, .mdf, etc.)
- Support of angle and time-based data.
- Loading of KiBox and FSI Cockpit screen layouts including same diagram objects with identical signals and results.
- Creation of templates for standards displays and reports for direct export to standard office file formats.
- Automation of data processing via folder watching/batch processing.
- Integrated application specific templates e.g. battery, CO<sub>2</sub>-efficiency, energy flow etc.
- Creation of reports for direct export to standard office file formats.



## Measure, analyze, and innovate future powertrains

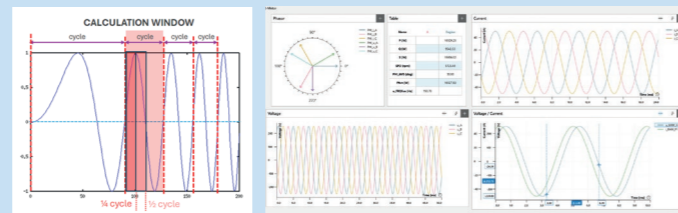
Modern powertrains combine multiple energy sources and propulsion systems, creating new challenges for efficient development. KiBox2 addresses these with high-speed, high-accuracy measurement capabilities that support engineers throughout the development process.

At its core, KiBox2 features a powerful electric power analyzer tailored for e-machine integration. It enables precise measurement of electrical power flows and losses, with synchronized, high-fidelity data storage for efficient offline analysis.

With an intuitive interface, fast setup, and advanced signal processing, KiBox2 simplifies electrical power analysis – helping engineers quickly identify losses and improve system efficiency. Its high-performance hardware ensures accurate real-time cycle detection, even down to a quarter of an electrical cycle. All data is stored in ASAM-compliant (.mdf) format with built-in converters for seamless workflow integration.

Electric machine efficiency characterization metrics

- Active, reactive and apparent AC power per phase
- Power factor
- Phase angle
- DC power (inverter input)
- Mechanical power (via add. torque flange)
- Power conversion efficiencies
- dQ0 Transformation



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