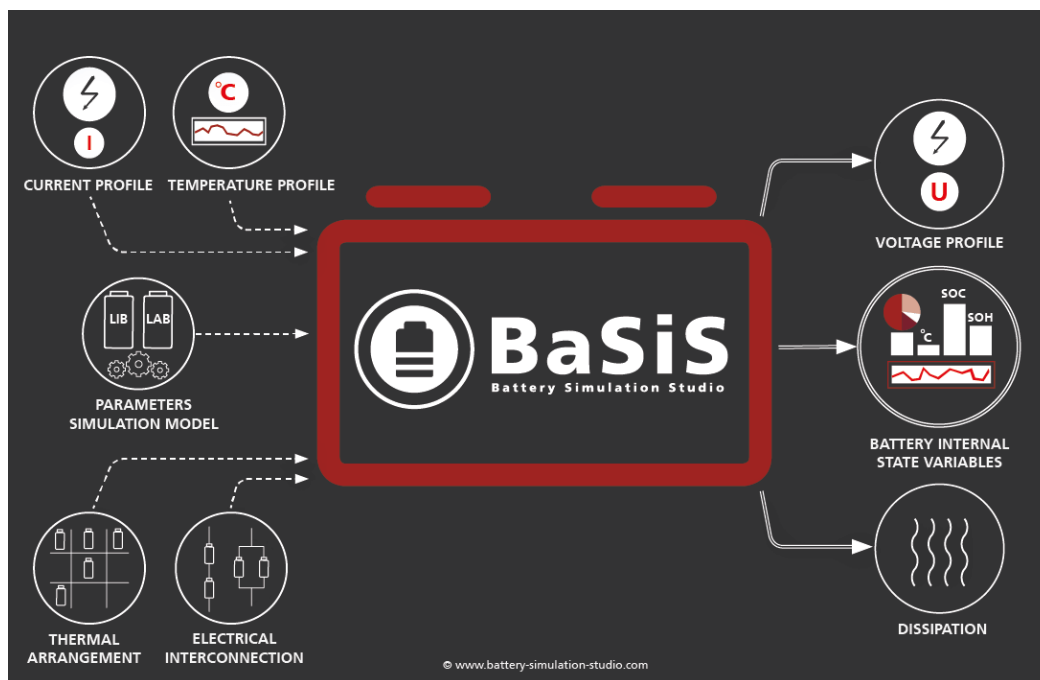


BaSiS Battery Simulation Studio: The Digital Twin of your Battery

Battery simulation is used to model a battery's electrical behaviour in a virtual environment. This makes it possible to study the battery performance without requiring a real battery. The simulation allows for predicting a battery's behaviour under different conditions, contributing to improving the battery's design and extending its life.

BaSiS – Battery Simulation Studio, developed at Fraunhofer IEE, provides a high-precision environment to analyse dynamic processes and aging effects in electrochemical storage systems, including lithium-ion, lead-acid, beyond-lithium technologies, supercapacitors, and fuel cells/electrolysers. It has been widely used for the development and validation of cells, battery packs, components, and management systems in both mobile and stationary applications.

The BaSiS real-time module enables digital twin-based emulation of energy storage in hardware-in-the-loop test environments, accurately reproducing terminal behaviour for efficient and cost-effective hardware testing.



Optimized Product Lifecycle: The comprehensive services offered by BaSiS allow to optimize the development of your battery system throughout the entire product lifecycle.

- **Design | Development:** Faster and more cost-effective development of your battery systems
- **Testing | Quality assurance:** Use of the battery simulation for test systems
- **Operation | Service:** Advance modeling and testing for more reliability in operation
- **Recycling | Lifetime:** Information about the end of the product lifecycle of your battery even before it is reached

Battery simulators are used in various areas, such as in the automotive industry, medical engineering, various battery systems in general, as well as sector-specific test benches.

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Fraunhofer's battery research focuses across the entire battery value chain - from advanced materials, cell development to system integration, technology evaluation, and the digitalization of battery research, production, testing, recycling and reuse of the batteries. Fraunhofer is having extensive experience in wide varieties of technologies from state-of-the-art (Lithium-Ion, Lithium-polymer...) to next gen (lithium Sulphur, metal-air, Na-ion, solid state...) battery technologies

Kindly get in touch with us if you are interested in this technology or require further information.

Thanks and Regards,

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