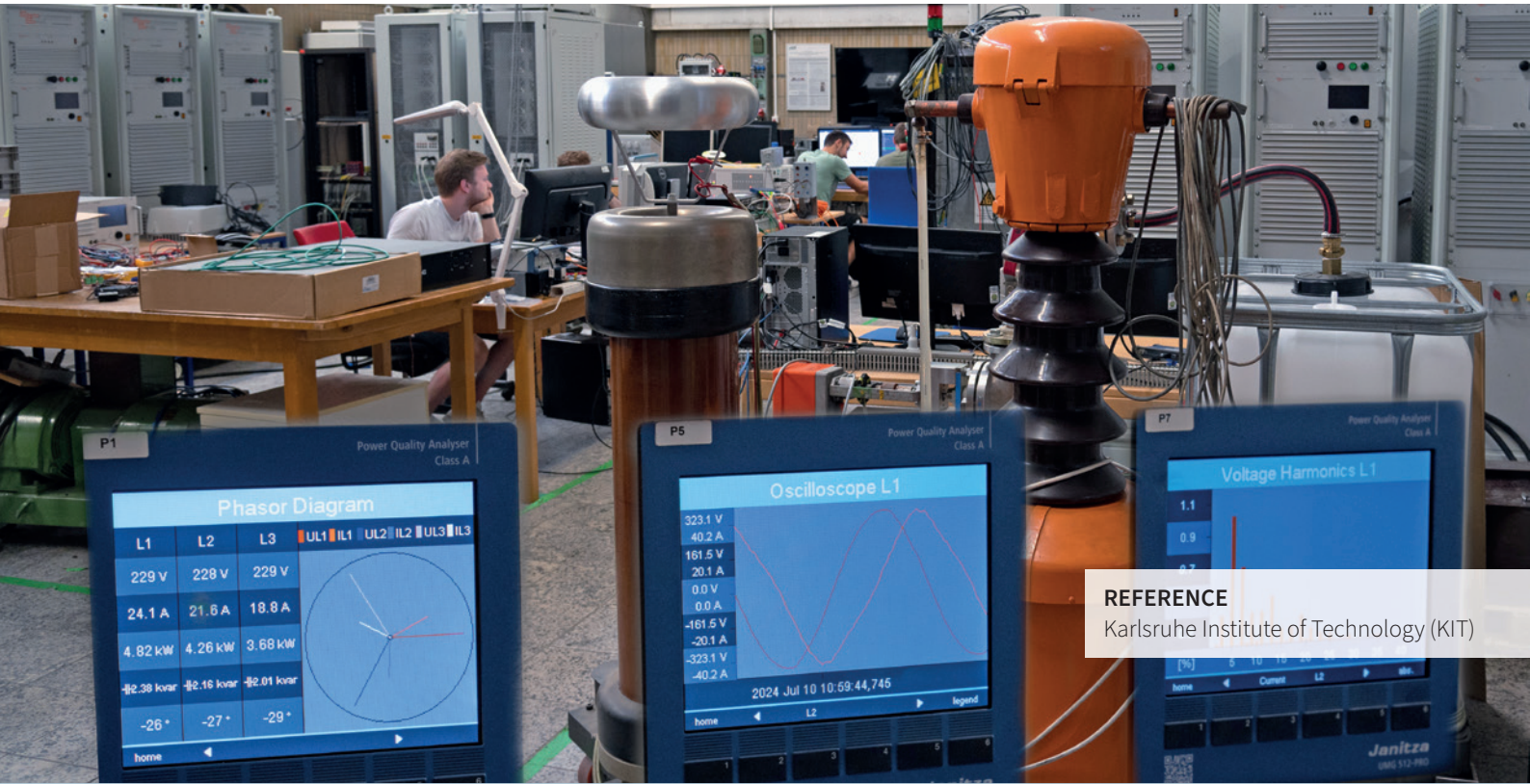


Project Brief



SMART ENERGY FOR  
FUNCTIONAL BUILDINGS

**Janitza**



Displays in the entrance area provide information about energy consumption in the building



The expandable modular power analyzer UMG 801 can be expanded with modules

## MEASUREMENT TECHNOLOGY IN RESEARCH

### CHALLENGE

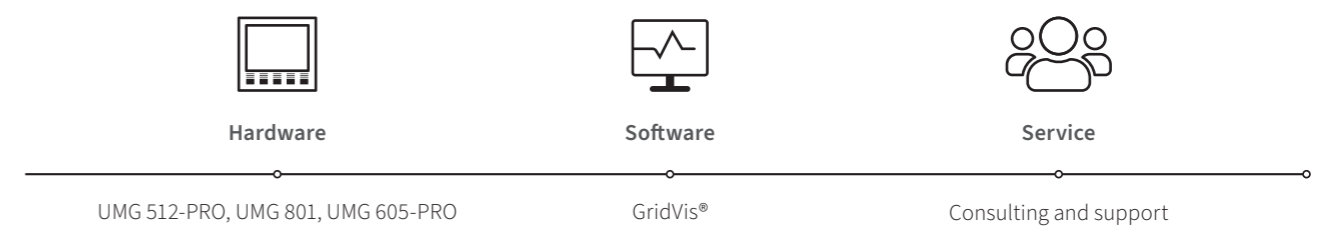
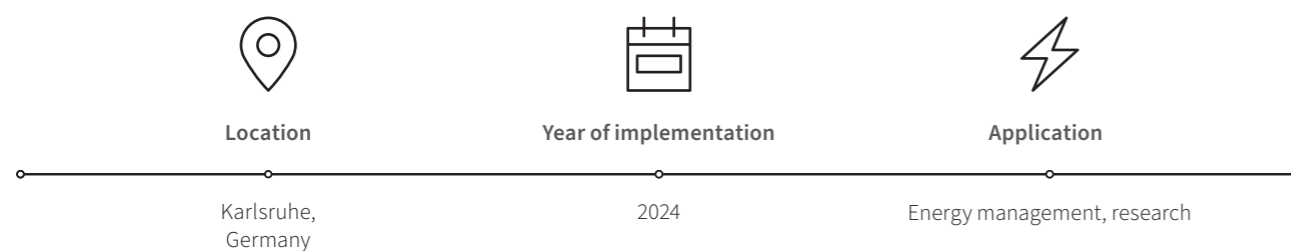
Renewable energies require intelligent consumers. The infrastructure of large-scale facilities, such as PV systems, charging stations, etc., should be designed to support the grid as much as possible. At the Karlsruhe Institute of Technology, this is being researched with the help of its own facilities. With offices, workshops and test halls, it offers a diverse range of consumers with correspondingly high energy requirements, which in future should be met in the most resource-efficient way possible. There are two ways to achieve this: either by drawing less energy from the grid overall or by coordinating shifting consumption to less critical times.

### SOLUTION

The research project is based on a real-time simulation environment in which actual systems are connected to a simulated power grid. The parameters of the simulated grid can be varied in a very short time, with the use of real hardware ensuring a high degree of accuracy in the tests. The reason for this effort is the interactions between loads, which behave in a much more complex manner than the systems in residential units. For example, machines use different communication protocols, which lead to latency when they are connected. This requires high-resolution measurement data that can be accessed by several systems at the same time. In Karlsruhe, these are the power grid monitoring software GridVis®

### BENEFIT

The existing installation is a good training ground, as it is often impossible to determine exactly which consumers are connected where. The conditions are ideal for nonintrusive load monitoring (NILM). If you know the ratio of active and reactive power of a device and how long it normally operates, you can identify typical device patterns. This information can be used to improve the energy management system without the need for time-consuming individual measurements. It is even possible to synchronize processes or test setups that allow flexible operation with forecasts of surpluses from PV or wind energy. In addition, the research project has already contributed to direct energy savings.



## ABOUT JANITZA

Janitza develops comprehensive energy measurement solutions that ensure transparent energy flows and monitor power quality. The global company, headquartered in Germany, provides individual solutions to meet specific customer requirements across a wide range of industries, including data centers, manufacturing, buildings & infrastructure, utilities, and renewable energy.

## PRODUCT RANGE

Janitza's portfolio includes innovative measuring devices and the perfectly integrated Power Grid Monitoring Software GridVis®, complemented by high-quality components. Customers worldwide benefit from solutions in energy data management, power quality monitoring, and residual current monitoring, all within a unified system environment – Made in Germany.

## HEADQUARTER

### Janitza | Germany

Vor dem Polstück 6  
35633 Lahnau  
Phone: +49 6441 9642-0  
Email: anfragen@janitza.de

[www.janitza.com](http://www.janitza.com)

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## GLOBAL

### Janitza | USA

Phone: +1 888 526 4892  
Email: sales-us@janitza.com

### Janitza | Austria

Phone: +43 7942 214 966 194  
Email: anfragen-at@janitza.com

### Janitza | Mexico

Phone: +52 56 6674 4808  
Email: sales-mx@janitza.com

### Janitza | Australia

Phone: +61 411 544 114  
Email: sales-au@janitza.com

### Janitza | UK

Phone: +44 7939 697 434  
Email: sales-uk@janitza.com

### Janitza | India

Phone: +91 900 387 6980  
Email: sales-in@janitza.com

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