DATA CENTERS

The case for a single **BMS–EPMS interface**

A unified UI for building operations can boost efficiency, enhance user experience, increase reliability and improve total cost of ownership.
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The case for a single **BMS–EPMS interface**

Traditionally, the Building Management System (BMS) and Electrical Power Monitoring System (EPMS) were operated separately. Let's explore the benefits of integrating the BMS and EPMS into one cohesive and seamless platform, especially for new greenfield data centers.

Managing a data center is no trivial task. It is both time-consuming and critical, since several challenges must be addressed. First and foremost, the highest-possible efficiency has to be achieved with the goal of lowering energy consumption and minimizing the carbon footprint. At the same time, security and compliance must be ensured at all times, which makes system monitoring and transparency indispensable. Adding to the complexity is a number of regulations and KPIs that must be considered to ensure full and continued productivity.

A very important tool here is the BMS, which is used to track lighting, security, fire safety, plumbing and water systems, and of course, heating and ventilation systems. Regarding the latter, the BMS precisely monitors and regulates temperature as well as humidity levels to protect IT equipment from overheating and other damage. And it is also essential for optimizing airflow and managing air quality. Moreover, by using the BMS to track electricity use, operators can lower their consumption, which in turn improves their CO2 footprint and leads to cost savings.

A new tool for **new challenges**

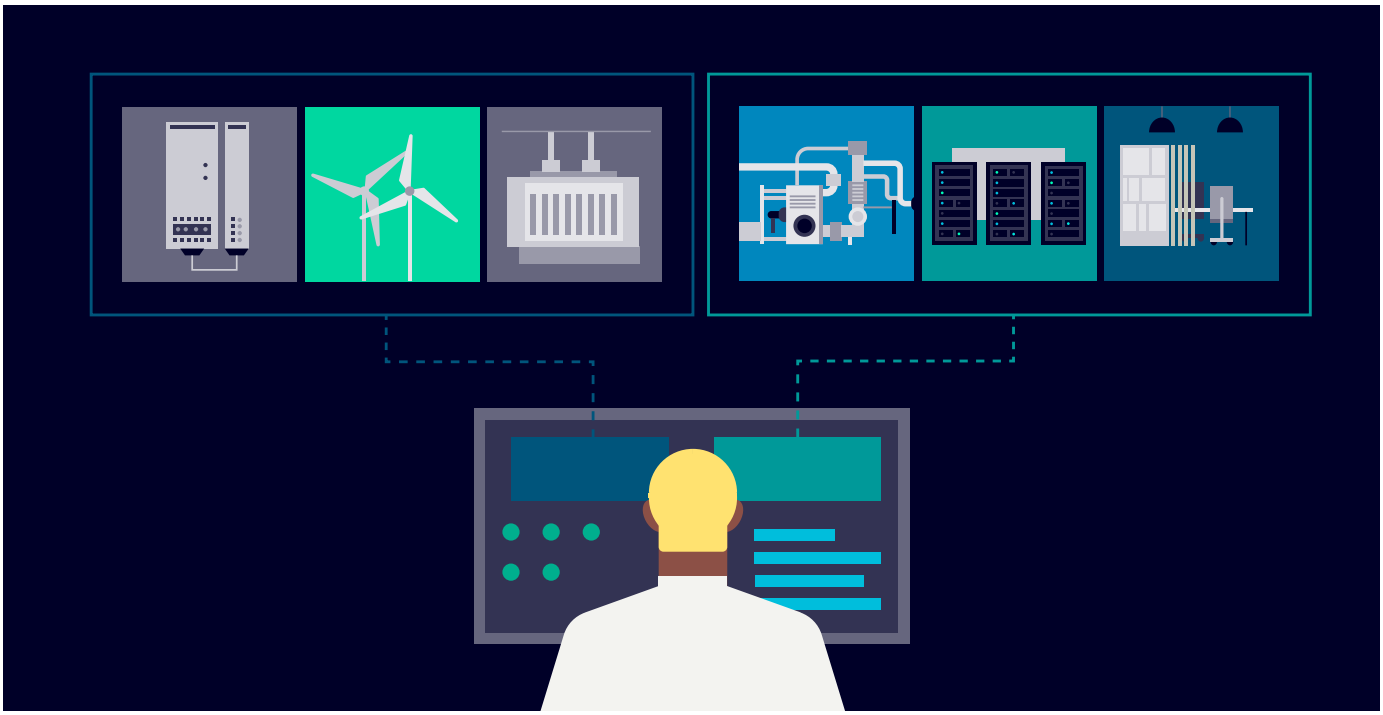
Yet in data centers all over the world, operators want to go further with environmental protection, and as a result they have been introducing photovoltaics and battery storage systems to their operations. These types of systems need something a BMS cannot offer, namely the ability to monitor or log parameters at speeds for capturing power quality events, including details on aspects like circuit loading, peak demand, and equipment status. While an **EPMS time-stamps events down to the millisecond,** a common response time for a **BMS is between 5 and 60 seconds,** depending on the use scenario.

In a data center environment, the EPMS facilitates monitoring and operation of all electrical components, including trend measurements. If an issue in power supply is detected, the operators are able to pinpoint the source. For example, they can determine if a power-quality event occurred upstream or downstream of the meter.

Furthermore, they can then quickly and easily establish whether the source of the event was external (utility) or internal. In the case of an internal event, the EPMS lets them even narrow it down to a specific part of the facility.

These capabilities are extremely useful for short-duration, seemingly harmless events that may not cause any equipment damage or downtime but are telltale signs of a failing piece of equipment that requires preventative maintenance to avoid future catastrophic failure and downtime.

Likewise, operators can detect which components are consuming inordinate amounts of energy. In the extreme case of a power outage, the EPMS aids a quick recovery, which in turn increases reliability and reduces downtime.



A novel approach to operations

Traditionally, data center designers have been keeping the BMS and EPMS separate. While that is a viable option, the best results are achieved when the systems are combined in one platform with the same user interface (UI). Studies have shown that organizations can achieve **some 30% reduction in training time and costs** when utilizing a unified UI for building operations compared to managing multiple disparate systems. This is attributed to simplified workflows and reduced complexity in learning and navigating the interface.[1]

An integrated design has especially proved its value in new data centers with their hybrid architectures and solutions from different vendors. Here are some of the benefits:

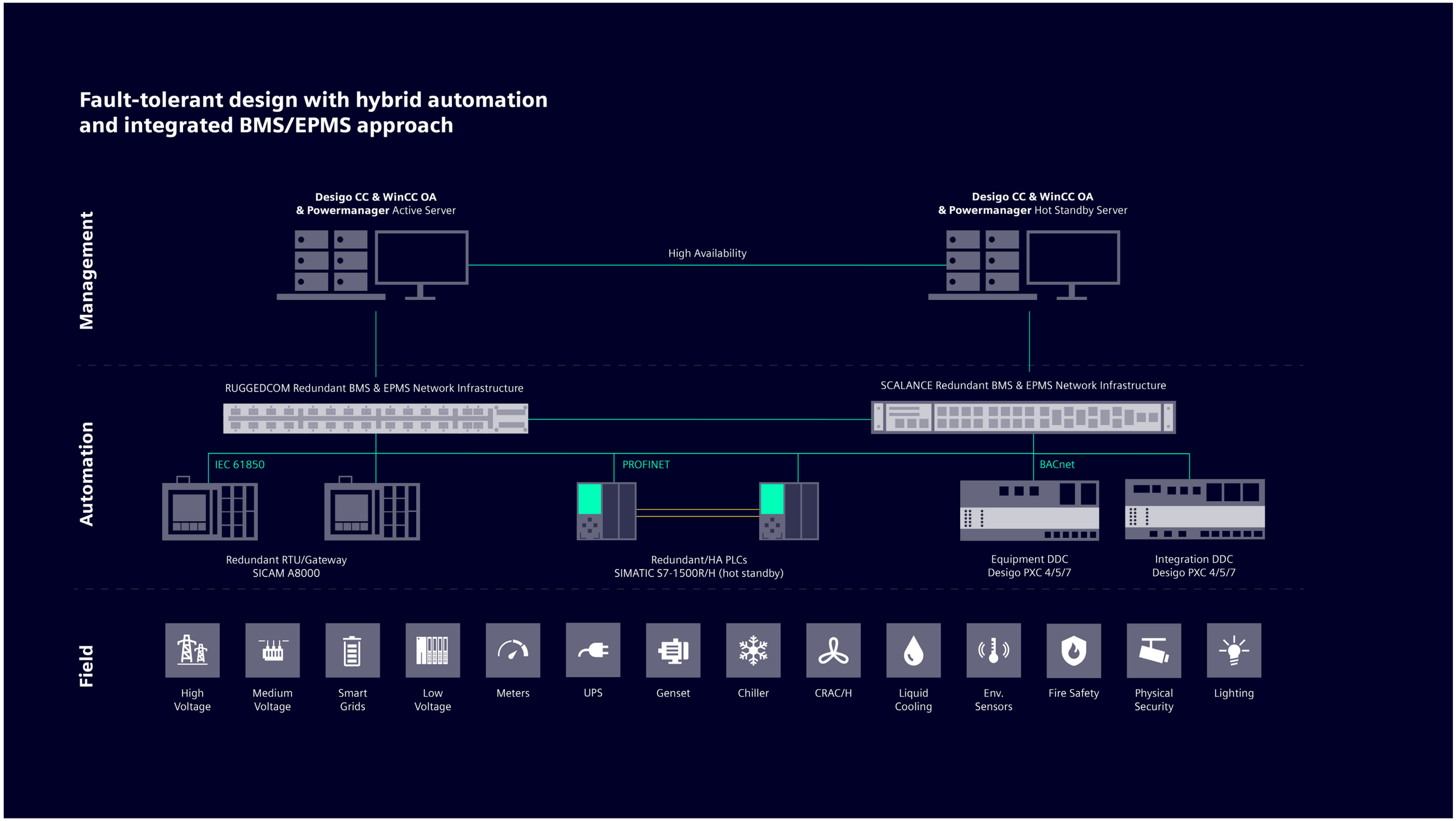
- **Unified view and control:** A single platform offers a holistic view of the entire data center environment as a single pane of glass, improving operators' user experience (UX), and enhancing their performance. This simplifies monitoring and reporting, avoiding the need of Data Center Management Software (DCIM). Facility managers can see how power consumption impacts cooling needs and vice versa, allowing for proactive adjustments to optimize efficiency.
- **Streamlined operations:** Integration eliminates the need to switch between separate systems for different aspects of the data center, minimizing errors caused by referencing inconsistent data from separate sources. The integration reduces training requirements, leads to faster resolution times, and simplifies troubleshooting for any issues.
- **Enhanced analytics and reporting:** An integrated system allows for more comprehensive data analysis. Correlations between power usage and temperature fluctuations become readily apparent, facilitating the identification of areas for further optimization. Generating reports becomes a streamlined process.
- **Reduced costs:** The initial investment for an integrated system can be lower than the sum of the two, according to a Siemens study. Integration can reduce hardware and software licensing costs. Additionally, streamlined operations and improved efficiency can lead to further OPEX reductions.
- **Simplified maintenance:** A single system requires less maintenance effort compared to managing two separate ones. This translates to lower staffing needs and potentially less downtime for maintenance activities.

More than a nice-to-have

Data centers that adhere to leading industry standards like **ISO 50001, SS564, and Green Mark** are required to continuously monitor and improve the performance of their mechanical and electrical systems. Facilities operating with an integrated BMS–EPMS are able to fulfill this goal seamlessly. Through clear and comprehensive monitoring of key metrics with an integrated BMS–EPMS, data center operators can swiftly identify and rectify deviations from compliance standards.

1 - https://www.engineeringnews.co.za/article/five-financial-wins-of-integrated-epms-bms-solutions-2024-10-23

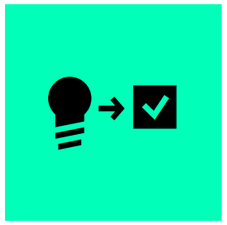
Reference architecture schematic



In conclusion, an integrated BMS–EPMS unlocks a wealth of benefits. The common UI provides operators with comprehensive view of a data center's energy ecosystem. Automated data logging and reporting helps to ensure efficient resource utilization and proactive maintenance. And in the unlikely case of unplanned downtime, they can resolve the issue at its source.

But perhaps even more important, an integrated BMS–EPMS shows its value in optimizing energy used to keep a data center's carbon footprint as low as possible. In day-to-day operations, the approach is especially suited to greenfield data centers, yet it has also proven its value with brownfield sites.

Integrated software **improves the total cost of ownership**



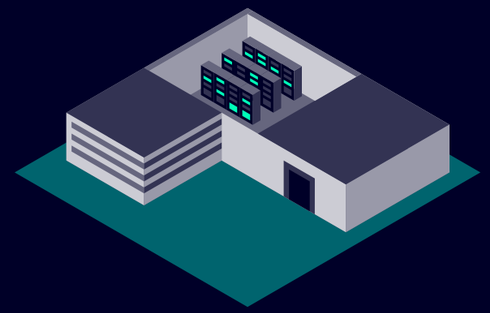
By consolidating software licenses, data center owners can lower their total cost of ownership. Many studies revealed potential **savings in software license fees and lower support services costs** over the lifecycle of the building by adopting a unified UI for building operations.

Furthermore, implementing a unified UI for building operations can also improve efficiency, enhance the user experience, and increase system reliability.

Power quality solutions from Siemens **for your data center**

Offerings

- **EPMS & BMS** in one system Desigo CC + SENTRON Powermanager module
- **Separated EPMS** SENTRON Powermanager
- **Condition Monitoring**
- **PQ Advisor**
- **Interface for** additional service with partners



Service offering

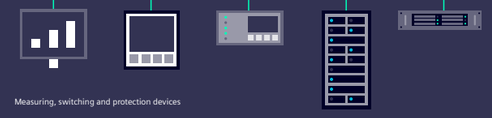
PTI - Power qualaity service

- Analytics
- Monitoring
- Setup
- Diagnosis & Alerts
- Reporting
- Optimization

SW solution

EPMS & BMS **in one system** — **OR** — **Separated** EPMS

Field devices



Measuring, switching and protection devices

SENTRON Powermanager

SENTRON Powermanager software lets energy managers, energy consultants, and facility managers monitor energy consumption in buildings and plants; keep an eye on the condition of their low-voltage power distribution and on the power quality; and generate reports for operational power management according to ISO 50001. The solution functions with communication-capable measuring, switching, and protection devices in the SENTRON portfolio, as well as with third-party devices. Data is saved for the evaluation of load peaks and load profiles, making it possible to lower energy costs.

SICAM Q100 power quality recorder

The SICAM Q100 multifunctional measuring device is used for acquisition, visualization, evaluation, and transmission of electrical measured variables, such as alternating current, alternating voltage, frequency, power, and harmonics. In addition, this all-in-one device provides a combined recording and evaluating function: measured values can be recorded in parameterizable time intervals with various recorders such as power quality and fault recorders. Longtime data and events are evaluated directly in the device and displayed as a report according to the power quality standards (e.g., EN 50160).

SICAM Q200 power quality recorder

SICAM Q200 is a network analyzer for high-definition acquisition and assessment of the power quality in electrical power supply systems. It offers algorithms and functions for energy management applications. The device supports continuous acquisition and analysis of all relevant parameters. These results help to identify and implement programs to ensure supply quality. The use of SICAM Q200 increases the service life of the equipment while at the same time reducing downtimes.

Desigo CC

Desigo CC is the integrated building management system for managing high-performing buildings. Acting as the technology backbone, Desigo CC provides a powerful management solution that revolutionizes comfort, security and efficiency. As part of the Siemens Xcelerator portfolio, Desigo CC enables the transformation to self-adapting buildings. Thanks to its open architecture, Desigo CC simplifies technology integration and ensures adaptability for future requirements.

Power Quality Analytics

Power Quality Analytics (PQA) is an innovative and scalable digital service from PTI Consulting to detect disturbances, prevent damage to equipment, and reduce outage costs in electrical grids. Power quality (PQ) data is continuously recorded and then analyzed using modern artificial intelligence (AI) algorithms. This is the perfect complement to our proven fault analysis approach. Our experienced Siemens PQ experts verify the diagnosis provided by the analytics system. In case of a critical event, they also consult on suitable mitigation measures.

Let's talk!

Fill in this contact form to start a conversation with our data center experts.

Visit Redudant Automation use case

Discover more information and offerings for increased uptime with redundant automation design!

Visit our website

Discover the Siemens data center offering and use cases that align with the strategic business goals.

Visit Power Quality use case

Discover the benefits of integrating BMS and EPMS into a single platform when it comes to power quality.

Visit BMS-EPMS use case

Discover more on how to integrate BMS and EPMS into a single platform in data centers.

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