ABB

Monitor, optimize and control low voltage data center electrical distribution, and predict asset maintenance requirements

The ABB Ability® electrical distribution control system (EDCS) is a powerful, cloud-based solution designed to monitor and optimize low voltage power distribution systems. With the ABB Ability EDCS, data center operators or facility managers can easily control the flow of energy to ensure the flow of data.

AUTHORS
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Stan Levenstone
Business Development
Manager, ABB Ability,
ABB Electrification
Products Division
—
Daniel Lightsey
Technical Manager,
ABB Ability,
ABB Electrification
Products Division

You wouldn't try to operate a data center without generators to back up utility-supplied power or UPS systems to condition that power before it reaches your critical load.

By the same token, it's critical to deliver the right amount of conditioned power to each segment of your IT load and ensure that every asset in your electrical distribution system is operating properly to deliver that power reliably.

Until now, however, there hasn't been an easy and efficient way for you to monitor, manage and maintain the electrical distribution system within your facility.

ABB Ability EDCS changes all that, enabling you to monitor and manage your data center's electrical distribution system — at one site or many sites — via smartphone, tablet or computer in real time to optimize energy use and costs.

With ABB Ability EDCS, you can make informed decisions about what controls to put into place, as well as predict asset maintenance requirements to improve your data center's uptime.

You gain the control you need to ensure the continuous flow of critical power through predictive maintenance, as well as to reduce cooling costs. In addition, you'll have power usage effectiveness (PUE) data for benchmarking.

The system is surprisingly cost-effective and doesn't add complexity or require investment of manpower on your part. ABB Ability EDCS components are easy to install and get up and running fast.

This white paper offers more detail on how and why ABB Ability EDCS can be used to better manage electrical distribution systems in data centers.

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ABB Ability and its potential for ABB customers

ABB Ability

In 2016, ABB unveiled its new centralized cloud-based software platform — ABB Ability.

The aim of ABB Ability is to bring together all of ABB's digital products and services — each of which is built from a unique combination of sector knowledge, technology leadership and digital expertise.

As well as housing ABB's digital offering, ABB Ability enhances ABB's industrial internet of things (IIoT) capabilities across a scalable, horizontal plane throughout its digital offerings.

ABB Ability continues a very productive trend with one of the largest installed bases in the industry. More than 70,000 digital control systems and over 70 million devices are already operating in the field, reflecting enormous potential for ABB customers.

To enhance performance and guarantee the highest reliability and security, ABB Ability communication is based on Microsoft® Azure®. ABB and Microsoft Corporation have entered into a strategic partnership to deliver on Azure and ABB's deep domain knowledge and extensive portfolio of industrial solutions.

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ABB Ability EDCS

To bring all the power of ABB Ability into managing your electrical distribution system, you need only integrate a few, simple ABB Ability EDCS components within your data center electrical distribution system.

With the addition of these components, you now have the tools to monitor the electrical systems at one or multiple sites using the cloud-based Azure system that is an inherent part of the ABB Ability concept. With this data, you can begin to optimize and control the amount of power you use and the performance of the assets you rely on to continue to deliver it.

ABB Ability EDCS enables you to:

- **Monitor** — Determine plant performance, supervise the electrical system and immediately provide access to the most important information.
- **Optimize** — Collect data from each device, set up reports for analysis and use the output to inform business decisions.
- **Control** — Set up alerts to be notified in real time to make quick decisions and implement an effective power management strategy.
- **Predict** — Reduce unplanned downtime with predictive maintenance.

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Manage multiple remote sites from one location

With ABB Ability EDCS, you can monitor the electrical distribution systems at multiple data center sites, allowing you to compare the performance of all of them. In addition, you can provide different levels of access to many users according to their individual needs.

These features enable you to monitor system performance and implement efficiency analysis and audits without having to travel on-site. Real-time data and historical trends can be collected from all your sites so that performance can be compared and benchmarks created. One maintenance technician can manage several sites, and because ABB Ability EDCS continuously performs diagnosis on the devices in the electrical system, maintenance action need only be taken when required. This higher level of predictive maintenance enhances operations and cuts costs.

ABB Ability EDCS provides insight into data centers of all sizes and complexities.

In addition, ABB Ability EDCS can be integrated into more complex supervision and automation systems while driving simplification of operations and cost reduction. By having ABB Ability EDCS manage power distribution, it is possible to reduce the overall cost and buildout time of a data center infrastructure management system by 30 percent.

Perhaps the greatest value of ABB Ability EDCS is that users can simplify the energy and asset management processes and activities in their facilities.

Plug-and-play simplicity combined with anytime, anywhere access

ABB Ability EDCS architecture
The ABB Ability EDCS operates through a web app, so it can be accessed anytime and anywhere via smartphone, tablet or personal computer. It provides multi-user access and immediate connection to the low voltage power distribution system.

ABB Ability EDCS cloud system access is available with installation of ABB Emax™ 2 circuit breakers, the ABB TruONE™ automatic transfer switch (ATS) or previous versions of ABB circuit breakers. The capability can be retrofitted into an existing facility using the ABB Ekip™ UP multifunctional relay, an industry-first innovation that lets customers keep their existing power hardware, digitizing it with a simple, software-driven, plug-in upgrade.

The electrical system can be connected with plug-and-play ease to the cloud-computing platform by sharing data with Emax 2 circuit breakers, the TruONE ATS or the Ekip UP relay. The solution can be embedded or external.

Embedded solution
An Emax 2 circuit breaker, TruONE ATS or Ekip UP relay equipped with the new Ekip Com Hub module establishes the cloud connection. This dedicated cartridge communication module just needs to be inserted into the terminal box and connected to the internet. Other devices can also share measurements and data with Ekip Com Hub and the cloud if the Emax 2 circuit breaker, TruONE ATS or Ekip UP relay is equipped with one of the following communication modules:

- Ekip Com Modbus RS-485
- Ekip Com Modbus TCP
- Ekip Link

ABB Ability EDCS makes things simple
By accessing the Ekip Com Hub module via Ekip Connect software, it is possible to achieve guided commissioning in just a few minutes, thanks to self-configuring connections.

External solution
Communication hardware can be mounted on a DIN rail to collect data throughout the electrical system. To collect temperature and humidity, a 3T measurement module is available. Optional modules for Wi-Fi or GPRS extend the possible applications.

— Monitor, optimize, control and predict

Monitoring
Monitoring functions are made easy by preconfigured widgets in the ABB Ability EDCS dashboard. Single or multiple facility data can be processed to display energy consumption trends. In addition, you can obtain insight into the electrical system through real-time demand information, peak trends and power factor and power quality information. ABB Ability EDCS tools ensure simple information exchange with a lower risk of downtime and maintenance cost reduction of up to 30 percent.

ABB Ability EDCS's asset management feature makes it possible to establish a familiar overview of the plant in the dashboard. In fact, you can upload custom diagrams, photos, switchboard technical drawings and images of plant synoptic panels. These images can be made interactive through tags and drag-and-drop tools. You and your team have access to all asset information you need, including:

- State of devices
- General parameters, such as device type, serial numbers and rated parameters
- Maintenance data, such as the latest maintenance operations, contact wear, number of trips, etc.
- Electronic data, such as software versions and relay information

ABB Ability EDCS also provides you with direct links to related ABB documentation and manuals for quick and easy reference.

Optimization
Access to all the relevant data enables you to maximize reliability and efficiency. ABB Ability EDCS provides digital collection and export of data, compilation of reports and access to historical trends. With the resulting knowledge of your electrical systems, you can establish effective benchmarks and compare them with best practices. In addition, you can digitally file maintenance activities or download them via reports.

ABB Ability EDCS analytics simplify and enhance the analyses of power factor compensation, energy management and costs allocation. By leveraging a comprehensive collection of data, decision-making can be fully informed.

Control
ABB Ability EDCS provides support not only in identifying where improvement can be made, but in remotely implementing an effective strategy for power peak control and energy management. The controls feature makes load management simple and bases actions on accurate measurements, thanks to ABB Ability EDCS and Emax 2 power controller function. Cutting down on power demand through a shedding/inserting routine for non-priority loads facilitates energy savings.

The ABB Ability EDCS alerts feature provides you with a plant watchdog. You can customize alerts settings to suit your needs and intervention plan, and to notify you or other key personnel at any time via text message or email.

Eliminate the high cost and complexity of traditional energy monitoring and management systems

Predict
The ABB predictive maintenance algorithm makes maintenance smarter, quicker and less expensive by allowing you to remotely monitor power system health and providing a predictive maintenance analysis so that service is only performed when necessary.

The analysis takes into consideration different key factors, such as the number of mechanical operations, nominal current, overloads, short circuits and environmental conditions such as humidity, temperature, vibration and corrosion.

This cloud-based solution significantly reduces the risk of unplanned downtime, maximizing service continuity, making management simpler and cutting investment costs.

Simplicity
The ABB Ability EDCS solution eliminates the high cost and complex setup of a traditional energy monitoring and management system. Just install a simple cartridge or communication device to establish the cloud connection. ABB Ability EDCS provides real simplicity, allowing you to connect a panel to the cloud in about 10 minutes.

ABB Ability EDCS operates through a web app interface, so you can use it anytime and anywhere via smartphone, tablet or personal computer.

Once the connection is set up, you can extend platform access to additional users — such as contractors and staff — with a few clicks. Each user is assigned tasks and authorizations according to their role in the data center operation.

Since there are no complex multiple DIN-rail adapters or gateways to be installed, ABB Ability EDCS reduces the number of hardware components required by up to 60 percent. ABB Ability EDCS's integrated architecture also enables reduction of wiring and connection time, while simplifying the integration of devices in the system.

ABB Ability EDCS in the field
The first pilot installation of ABB Ability EDCS was at an Italian public water company, Consorzio di Bonifica Veronese. ABB Ability EDCS provided the customer with remote supervision and alerting, which reduced the time and costs spent on travel between the different sites. It also allowed proactive intervention to restore normal working conditions, avoid faults, perform maintenance and reduce downtime.

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Field-proven results

These measures helped the customer achieve a 40 percent savings on maintenance time and a 30 percent savings on operational costs. The likelihood of incurring penalties for poor power quality — an ever-present risk in an industry with variable-load water pumps — was also greatly diminished.

In addition, the availability of this data made the customer eligible for energy efficiency certificates worth $25,000, without requiring the time and expense of independent external auditors. The customer will now deploy this solution across dozens of additional water distribution facilities.

ABB powers one of largest regional solar rooftops in Dubai
Another field implementation of ABB Ability EDCS is found in one of the largest privately owned solar rooftops in the Gulf region, in Dubai, United Arab Emirates. The 315 kW solar rooftop is at ABB's Al Quoz facility. The electricity generated from the solar rooftop is used for powering the ABB office while any surplus power is fed to the state utility provider.

ABB Ability EDCS connects the ABB solar rooftop to the IIoT, creating a digital profile of the photovoltaic installation, continuously analyzing power quality, as well as tracking trends in the site's energy production and demand. Continuous diagnosis of the solar rooftop helps maximize the asset's productivity and makes maintenance more effective and intelligent.

IIoT and ABB Ability EDCS
ABB has been advancing technologies for the IIoT for more than a decade via its control systems, communication solutions, sensors and software.

ABB Ability EDCS allows digital collection and export of data, compilation of reports and access to historical trends.

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Contact us

ABB Inc.
Electrification Products
860 Ridge Lake Blvd.
Memphis, TN 38120

www.abb.com

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ABB Inc.
Electrification Products
860 Ridge Lake Blvd.
Memphis, TN 38120

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