TECHNICAL PAPER

Listen to your power control and distribution devices

Your power- control and distribution devices – breakers, transfer switches, etc. – are collecting an array of data. Connect those devices via available communication capabilities to achieve new levels of control, reliability, and efficiency.

—
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ABB Ability™

Your power- control and distribution system probably has a lot to say. Are you listening?

Most commercial/industrial power- control, management, and safety devices today come with built-in sensors. Breakers, transfer switches, and other devices have the ability to constantly capture, store, and send information about their status, health, and environment, creating a rich trove of data. In many cases, though, the potential value of that data is greatly underused and sometimes completely ignored.

That's often because facility managers aren't aware how easy it is to tap into that data via the many communication capabilities available, whether those capabilities are built in to the device or available as an add on. What data are those devices collecting, what's the value of the data, and how does their communication capabilities enable you to take the greatest advantage of the data?

A rich data source

Many power- control and distribution devices are available with sensors able to capture a remarkable range of operating parameters. These sensors are standard equipment in higher-end, more capable devices.

Operational stats like number of opens and closes are typically included. It's also possible to find devices that capture information on current, voltage, harmonics, and power quality. Devices may also include environmental sensors like vibration and temperature, including ambient temperature in the cabinet or lineup as well as external- and internal-device temperatures.

Beyond simply capturing this kind of data, the more-sophisticated devices can also do calculations of critical device information. For example, algorithms that consider number of operations, current, temperature, and other variables can provide highly accurate assessments of the need for maintenance.

Putting the data to work

All of this information is of obvious value from an operations standpoint. Operators gain real-time insight into the status of these sensored devices, enhancing facility and process control. They can also use the information to more- effectively manage their maintenance activities. Thresholds and alarms can be

set for many of these parameters, alerting technicians to assets that require attention.

While alarms and alerts are powerful tools, the ability of devices to take action on their own can be even more valuable. The devices can protect themselves as well as downstream assets by making programmed responses to specific conditions or events. This is particularly useful with remote assets where a warning light or siren could go unnoticed.

With the appropriate analytics, it's also possible to implement a highly- evolved predictive- maintenance strategy. Rather than relying on a scheduled inspection and maintenance program, it's possible to identify devices that actually require attention. Rather than responding to device failure, it's increasingly possible to identify worrisome trends and address them early. This capability nicely supports the increasing demand for asset- management programs.

In facilities with building-management systems, the data provided by the power- management and distribution devices can not only reduce unplanned outages, but also enable more effective energy-management strategies. These can benefit facility managers responsible for a large, complex campus, as well as smaller, simpler facilities that simply require effective power- control strategies for dynamic- load requirements.

Accessing and sharing device data

The power of these smarter devices increases exponentially when they are put on a network, enabling remote operators to access the data. Today's devices typically offer a range of communication options: PROFINET, EtherNet/IP, Modbus, etc., so there's usually no need to add communication or network devices.

The current generation of Ethernet-based protocols makes adding a breaker, switch, or other device a plug-and-play task. That makes it an ultra-low-cost way to keep a remote eye on assets and processes. Adding communication capabilities makes it possible to transmit alerts to operations and maintenance staff wherever they are via text, email, or other channels.

Many of these capabilities depend on the device software as well as the higher-level power- control applications. High-performing devices come loaded with intuitive programming that pretty much works right out of the box with virtually no programming required. Cloud-based control applications provide the broadest access to device data, as well as the highest level of analytics, control, and reliability.

A strong example of such a cloud-based platform is the ABB Ability™ Electrical Distribution Control System (EDCS) deployed in Dubai's Burj Khalifa, the tallest structure in the world. Relying on data from devices throughout the building, EDCS is remotely monitoring the power supply of each of the 400 electrical loads at the site, including the 57 elevators and a 24MW air conditioning system, among other loads.

Big benefits – like an estimated 30% reduction in operational costs – are being realized in the world's largest building, but also in small commercial and industrial facilities. Facility managers should explore the capabilities of their power- control and distribution devices. What data is available, how can it be accessed through your communication networks, and how can you put it to work to enhance your operations, increase reliability, and reduce energy and operations costs?

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