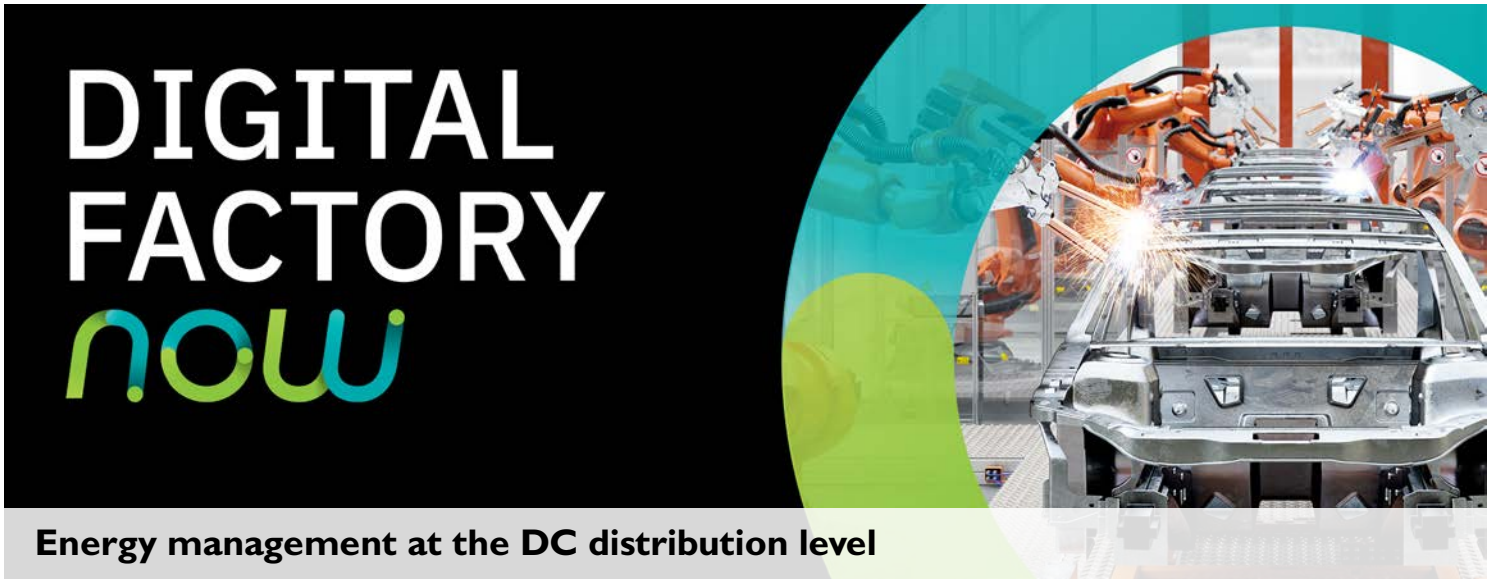
Industry: Automotive

Customer case study



Energy management at the DC distribution level

Highlights

- An automotive manufacturer needed a more flexible circuit breaker system at the DC level
- CAPAROC, a data-driven circuit breaker system, exceeded the customer's requirements
- A human machine interface (HMI) and edge PC collect CAPAROC's data and provide visualization, giving the customer real-time information about critical values
- The system is IIoT-ready and will be easy to expand as the customer moves to a digital future

> "The CAPAROC was configured with 10 channels of protected DC power – more than enough for the current and future manufacturing needs."

Customer profile

The customer is an international group dedicated to the design, development, and manufacturing of metal automotive components.

Challenge: Protecting the power

Over the years, the metal products that the customer produces have become more complex, driven by lighter materials, new alloys, and state-of-the-art bonding technologies. The manufacturer needed to add more sensors, actuators, cameras, and other field devices to ensure traceability and provide the quality desired from the production equipment.

Figure 1: More complex products and processes mean manufacturers need to add more sensors, actuators, cameras, and other devices.

The manufacturer needed a reliable and flexible circuit breaker system to prevent downtime. The current design for distributing 24-volt power to the field was already packed with technology, using solid-state circuit breakers, configurable breaker channels, and communication over the control network. But it was limited to only a few power channels and required extra components, which added complexity.

It became impractical to use multiple stand-alone breaker devices, which added cost and used up space in the cabinet. The customer wanted a modular breaker system with solid-state technology packed with all the features they had become accustomed to.

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Solution: Data-driven circuit breaker system

The CAPAROC circuit breaker system from Phoenix Contact easily exceeded the requirements for the distributed power the automation architecture demanded. CAPAROC uses data-driven power modules to customize overcurrent protection. With numerous feed-in power modules, circuit breakers, potential distribution modules, and current rails, CAPAROC makes it easy to design an intelligent system with communication.

Figure 2: CAPAROC is a customizable electronic circuit breaker system. It uses data-driven power modules to customize overcurrent protection.

The QUINT power supply and QUINT buffer module ensure a reliable DC power source. The CAPAROC system, including the IO-Link module, provides integration and communication. It was configured with 10 channels of protected DC power, which was more than enough for the current and future manufacturing needs.

For operator safety and local control, an EPC 1500 and BWP 1500 Human Machine Interface (HMI) are mounted to the cabinet to collect data via IO-Link from the breaker system and provide local visualization. From the onboard HMI, operators can see alarms, safely reset breakers, modify the channel current settings, or just visualize real-time system values. The system can also communicate on the machine network, making it easier for HMI integration to an existing control package for power data collection and all the same features mentioned for the local HMI.

Results: Reliable power management for the IIoT

The solution encompasses both 24-volt power distribution and control. The HMI allows easy visualization and a safe remote reset option. There is also an option for alarming and trending, and it's easy to modify current output.

CAPAROC and the visualization give the customer access to real-time data about the power, which will ultimately prevent downtime. The system is IIoT-ready and will be easy to expand as the customer moves toward a digital future.

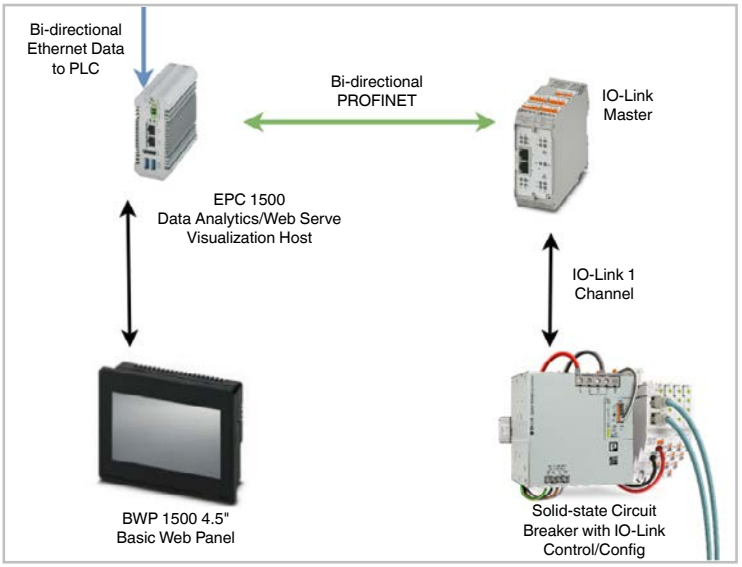

Figure 3: The network can collect IO-Link data and communicate real-time visualization values.

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