Eaton’s intelligent switchboard solution helps simplify your microgrid design
Eaton’s microgrid energy systems (MES) help companies facilitate electrical energy savings, resiliency and independence from a utility. By integrating multiple distributed energy resources (DER) on a common microgrid structure, users gain a reliable, scalable and efficient solution to unexpected power loss while enhancing cybersecurity.

Eaton works with customers, offering turnkey services on the concept, design, cost, implementation and maintenance of the entire microgrid/DER system.

Transforming generation, distribution and control for a sustainable future

In the next 15 years, half of the world’s electricity will come from renewable resources. That means more and more distributed energy resources will be online and more homes, businesses and communities will be able to produce and sell energy as well as consume it. This energy transition is changing how power needs to be managed and optimized for homes, at a facility level and for utilities.

Eaton is leading this transformation. We’ve taken the “Everything as a Grid” approach to the energy transition and are unlocking a low-carbon energy future. We’ve been helping customers safely add more renewables, storage and electric vehicle infrastructure to their energy mix—to become more sustainable and resilient while lowering energy costs.

Because cost and lead time are always a factor, Eaton supports a standardized built-to-order approach for microgrid switchboards. Whether the microgrid contains solar photovoltaic (PV), battery storage, on-site wind turbines, fuel cells or generators, switching and protection components can be added using our preconfiguration design tools.
Regional satellite plant locations

Our regional satellite switchboard plants can make additional custom modifications to address specific local code or utility requirements. This turnkey approach helps to simplify and easily integrate our switchboard solution into even the most complex microgrid design.
A reliable, intelligent and adaptable solution for your microgrid design

Eaton’s Pow-R-Line Xpert™ (PRLX) distribution switchboards combine integrated Power Defense™ insulated case and molded case circuit breakers, metering, surge protection and other various Eaton products for dependable and intelligent electrical distribution and protection. Available in maximum 6000 A main bus rating and maximum 600 Vac/Vdc, the switchboards provide enhanced accuracy and reliability for optimum system coordination with Eaton’s Power Defense circuit breaker family.

Typical microgrid switchboard configuration

<table>
<thead>
<tr>
<th>Depth</th>
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<td>36</td>
<td>30</td>
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- Relay and metering panel
- Power Defense ICCB
- Microgrid controller
Typical microgrid switchboard application
Eaton’s intelligent circuit breakers enable standardization, scalability and cost-effectiveness in microgrid switchboard solutions

**Power Xpert Release (PXR) electronic trip units**

Eaton’s Power Xpert Release™ (PXR) electronic trip units installed in Power Defense MCCBs are equipped with the latest microprocessor technology including advanced algorithms that signal when the power distribution system needs to be maintained or replaced. PXR trip units feature built-in communications, allowing you to use fewer components and a simplified design while keeping the system connected and customers informed. This embedded functionality accurately measures energy consumption with no additional meters or equipment, delivering critical data about the power distribution system and energy use in your facility.

**Energy management circuit breaker (EMCB)**

Eaton’s energy management circuit breaker (EMCB) provides intelligence that integrates the ability to monitor and manage energy usage. The EMCB includes innovative features such as Wi-Fi and cloud connectivity, remote monitoring and control of branch circuits, open application programming interfaces (APIs) and accurate revenue grade metering. The EMCB is equipped with bidirectional communication to deliver information and commands to a breaker at the dedicated load. This functionality allows Eaton to support numerous applications, from the utility to the business owner, as an integrated part of the system.
Key benefits

- **Reliable solution:** Built on a foundation of excellence, the feature-rich Pow-R-Line Xpert switchboard with Eaton’s Power Defense circuit breakers includes built-in communications, energy metering and breaker health diagnostics for safer, more reliable systems.
- **Intelligent design:** Communicate through Eaton’s PXR trip units installed in Power Defense circuit breakers, allowing you to use fewer components and a simplified design while keeping the system connected and customers informed.
- **Competitive lead time:** Assembled in multiple manufacturing facilities across the U.S. to meet local customer requirements.
- **Adaptability:** Endless configurations available to suit your specific applications.
- **Feasibility study:** Assesses your unique system to determine configurations and components to meet your specific needs.
- **Turnkey experience:** Leverage optimization strategies that maximize system performance, functionability and reliability, while providing a complete system.
- **Integrated controls:** Eaton’s microgrid controller is factory mounted and wired into the microgrid switchboard structure to streamline field installation.
- **Microgrid system optimization:** The microgrid controller can be designed based on customer needs to integrate multiple DERs (distributed energy resources) and optimize system energy savings, resiliency, and even independence from the utility grid.

**Eaton services and experience centers**

Eaton microgrid energy solutions provide full capabilities to assess, design and execute your microgrid projects to meet your reliability, sustainability and efficiency goals.

- Microgrid and electrical design services
- Protection, load flow and modeling studies
- Assets sizing, ROI and feasibility studies
- EVCI services as part of a microgrid
- Hardware in Loop (HIL) testing
- Turnkey services, startup and commissioning
- Largest switchboard assembly footprint in the U.S.

**Power Systems Experience Center**

Eaton’s Power Systems Experience Center located in Warrendale, PA, demonstrates our full-scale microgrid solution. The application features:

- Peak shaving
- PV smoothing and shifting
- Demand management and response
- Seamless islanding and reconnecting to the microgrid
- Long-term islanding, illustrating optimal use of resources
- Black start from generator or energy storage
- Microgrid-connected power factor
- Voltage regulation

Visit Eaton.com/experience to schedule a virtual or in-person tour.
Why Eaton?

Eaton can help you build and design microgrid solutions that deliver reliable power. Discover how you can reduce costs and improve reliability of electric power for your facility or campus. Experience a combined 90 years of expertise with industry-first power innovations when integrating Eaton's intelligent switchboard into your microgrid design. Built on a foundation of excellence, the feature-rich Pow-R-Line Xpert family with Power Defense circuit breakers includes built-in communications, energy metering and breaker health diagnostics for safer, more reliable systems.

Eaton's Electrical Services & Systems is one of the largest and most experienced industrial service organizations in North America. With more than 800 highly trained professionals in 60 engineering service locations throughout the U.S. and Canada, Eaton's Electrical Services & Systems has complete local, national and international capabilities to system design, feasibility studies, installation, startup, commissioning, maintenance, troubleshooting, life-extension and ongoing monitoring of operating parameters.

For more information and to contact an Eaton representative, please visit Eaton.com/microgrid