



Eaton Keeps Healthcare Facilities Running When You Need It Most



There's nothing worse than being sick or injured, and not knowing what's wrong. Diagnostic and critical equipment such as MRIs, CT-Scans and other monitoring equipment are vital tools for doctors to accurately diagnose patients, monitor health, and help determine the right treatment plan. Hospitals and healthcare clinics rely on these tools every day.

So, what happens when the hospital utility power drops out or requires additional power? Eaton's XLM supercapacitors help doctors help their patients by providing reliable peak and backup power to healthcare facilities, where even a short downtime can have an immense negative impact.

The XLM supercapacitor modules are designed to provide energy to uninterruptible power supplies (UPS) for critical applications during peak power spikes, brownouts or full outages, giving doctors and healthcare facility managers

the confidence that essential diagnostic tools are always accessible.

In addition to being reliable energy storage, the XLM supercapacitor module offers a low cost of ownership for healthcare facilities that can help with large capital expenditure deferrals when high power requirements cannot be met by the existing power distribution system. It offers a long operating life and eliminates battery or flywheel maintenance, control and replacement costs.

Eaton's XLM supercapacitor modules are high-reliability, high-power density, ultra-high capacitance energy storage devices utilizing electrochemical double layer capacitor (EDLC) construction combined with proprietary materials and processes. They feature low ESR for high power density along with environmentally friendly materials, as well as being Reduction of Hazardous Substance Directive (RoHS) compliant. This results in an

inherently safe construction, a key consideration for healthcare facilities. The XLM modules are maintenance-free with lifetimes up to 20 years, equal to or longer than the UPS, and can operate in temperatures from -40 °C to +85 °C.

Critical care beyond backup power

A healthcare facility selected XLM modules paired with a UPS to provide 20 kW of backup power for two minutes or 164 kW for 13 seconds. Additionally, the same XLMs provide 364 kW for two seconds to support CT scan pulses. This multipurpose system helped defer additional investment and retrofit in other, more expensive distribution equipment while also providing low maintenance operations for 20 years.

Having access to critical medical equipment and care when needed most provides peace of mind to doctors, and ultimately to patients. Eaton is the hidden power in healthcare facilities.

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

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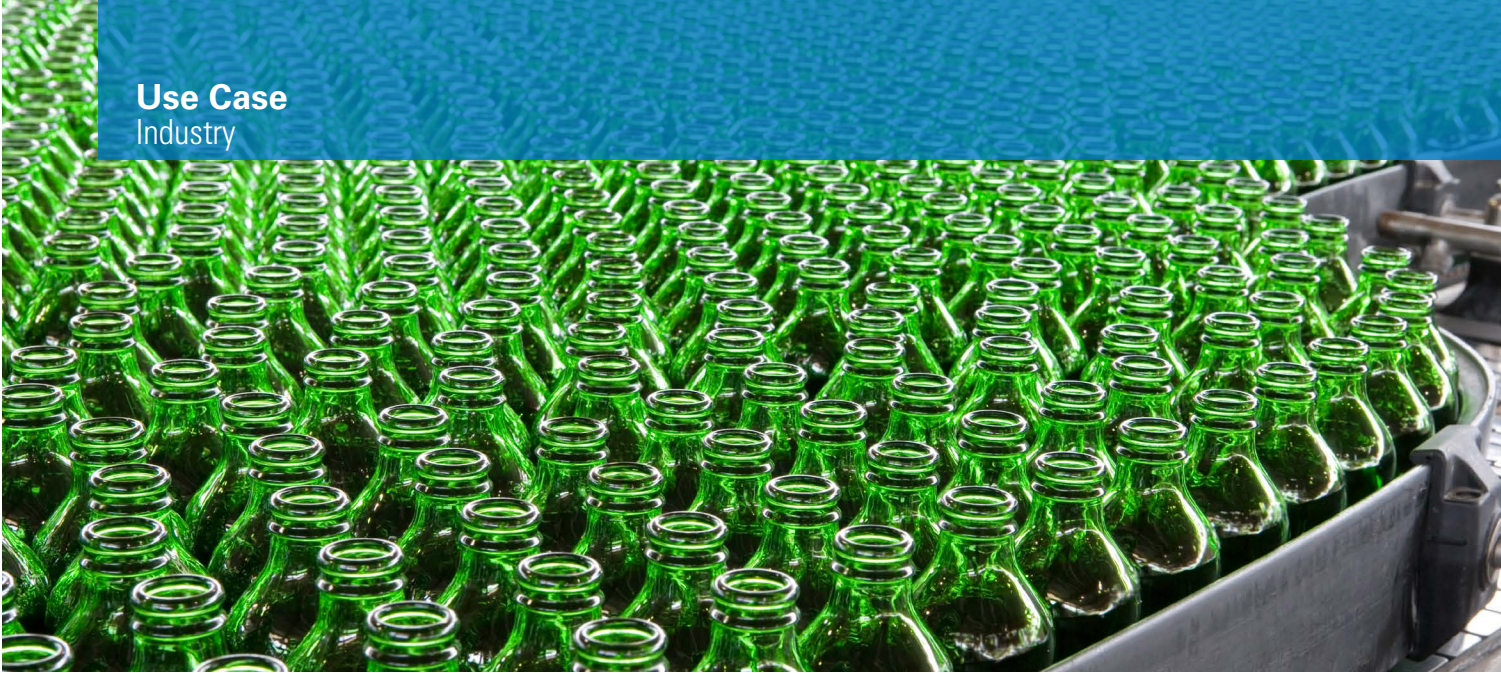
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Use Case Industry



Keeping Industry Moving with Eaton



A power loss, even for milliseconds, can cause hours of downtime with the potential to cost a manufacturing facility millions of dollars in lost productivity and scrapped work-in-process inventory, a reality that many facility owners and operators face. To protect an industrial facility from common power quality problems and blackouts for even the shortest period of time, Eaton has developed the [XLM-62](#) supercapacitor module. This is an ideal, reliable solution for applications in manufacturing and infrastructure projects, as well as for applications where traditional battery backed solutions cannot be used, are expensive or unreliable.

During a brownout, power spike or blackout – when the main electrical power is lost or unstable – the XLM-62 module is able to react instantaneously. This immediate backup is critical to prevent equipment from stopping and to protect irreplaceable data – allowing the system to ride through power quality problems and protect

operations until the utility power returns or a longer-term backup solution, such as a generator or fuel-cell, can be brought on line.

A short runtime backup power solution has traditionally meant high-maintenance batteries, or a less efficient mechanical flywheel with the potential to need additional floorspace to meet the power needs of the application. The XLM-62 supercapacitor module offers an energy storage solution that is highly reliable, economical and maintenance free. With up to a 20 year lifetime and operating ambient temperatures from -40 °C to +85 °C, the XLM-62 can be installed in virtually all indoor or outdoor locations and in just about any climate. The resulting lower infrastructure and operating costs, and greater scalability of the supercapacitor module, manufacturers receive an excellent return on investment. Eaton's supercapacitors use environmentally friendly materials and are Reduction of Hazardous Substance Directive (RoHS) compliant.

Powering the brewery

A large global brewery recognized these benefits and installed two 250 kW voltage sag ride through protectors at one of their new bottling facilities with Eaton's XLM-62 supercapacitor modules as the backup energy source. The inherent unreliable and unpredictable grid power required high availability backup power due to the frequent power quality issues. Due to the location of this facility, a system with very low ongoing maintenance was highly desirable as well. The capability to operate in wide operating temperatures also influenced the decision to integrate the XLM-62.

Having the right power backup can save a manufacturing facility lost time, sellable inventory and millions of dollars; a fact that that this brewing company has witnessed firsthand. Eaton's XLM-62 supercapacitor modules are the hidden power behind industry.

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Cleveland, OH 44122
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Supercapacitors Power Cutting-Edge Solar Installation Utilization



In the two-year period covering 2016 and 2017, over 25 gigawatts (GW) of solar power were installed in the United States*. If you consider that the typical gas-powered plant generates about one half of a GW, that total is equivalent to 50 typical plants. China's total solar capacity is a staggering 130 GW, with 53 GW added in 2017**.

With the exponential increase in solar adoption, using the energy is more of a stumbling block than generating it. The storage issue is a two-part problem. When the solar cells generate more power than is needed at any given moment, every bit of that excess has to be captured and then stored away. If a cloud passes overhead or if there is a sudden demand for power, that carefully stored power

has to be "withdrawn," then instantly distributed to where it is needed.

Supercapacitors are a compelling choice when energy density, or capacity, must be balanced with power density—or how fast that energy must be absorbed or delivered. This capability is required on a real-time basis to match demand and supply and control the ramp up or down of the energy supplied by solar technologies.

Even with shifting cloud cover and despite changing power loads for real-world, utility-level systems, there is little minute-by-minute variation in power surplus or deficit. These surpluses or deficits can be absorbed or supplied as needed by supercapacitors.

The [XLM Supercapacitor Module](#) from Eaton frees product storage designers from the tasks of buying multiple individual supercapacitors, wiring them into series and parallel configurations, designing housing and dealing with the multitude of issues involved with

safely harvesting, containing and deploying very high electrical energy.

Eaton's XLM supercapacitor can help efficiently and rapidly balance supply and demand in distributed or decentralized energy systems supplemented by alternative energy sources. This supercapacitor module is a high-power, high reliability, ultra-high capacitance energy storage device. It can be used as the sole energy storage solution or used in combination with batteries to extend lifetime, reduce overall cost, and maximize revenue potential.

The XLM features a low ESR for high power density with environmentally friendly materials, as well as being RoHS compliant. With up to a 20 year lifespan, the XLM module can increase the life of an energy storage system and eliminate the need for replacement parts and batteries. Having the right power system can help improve return on investment in alternative energy applications.

Supercapacitors can be charged

and discharged hundreds of thousands of times. They have no problem with either partial or total discharges and are built with environmentally friendly materials, so disposal is an easily handled issue. As our capacity needs for solar increases, so will the need for energy-saving systems such as supercapacitors.

* CNBC
** Forbes

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Cleveland, OH 44122
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Use case
Data center



Eaton keeps your data center online for the long term



As computing power demands increase, the need for “always on,” reliable storage is critical. The challenge for any data center isn’t just to create the server to store the data, it’s also to keep the server running at all times to avoid any data loss or emergencies for customers, even during a power outage. In doing so, data center operators have elected to require local power generation to ensure long term non-grid power supply.

With local generator or fuel cell power generation tied into the power distribution scheme, the backup time required of the UPS energy storage reduces from hours or minutes to seconds. This time measured in seconds is to bridge the gap from when utility power drops to when the long term, local power generation is ready to handle the load requirements.

UPS backup power solutions have traditionally meant low cost, high-maintenance batteries, or a less efficient mechanical flywheel with spontaneous, unplanned maintenance events. Recent

developments in various battery chemistries offer higher energy dense products, but still have periodic maintenance and face restrictions on the environments in which they can be installed. The higher energy density may not be advantageous for the short backup times that are more frequently being requested.

Flywheels market similar features as supercapacitors including low annual maintenance and high-power density. But, reports have been made about the immense costs of unplanned events requiring lengthy repairs.

Eaton’s XLM supercapacitors offer a backup power solution that is highly reliable, lightweight, and virtually maintenance-free. With a low total cost of ownership and greater scalability, data center operators get a greater return on their assets.

The XLM module features high power electrochemical double layer capacitor (EDLC) cells paired in series along with

proprietary materials to match front terminal batteries that OEM and service technicians are familiar with.

Eaton’s supercapacitors run on lifetimes up to 20 years. With wide operating temperatures from -40 °C to +85 °C, data center owners and operators reduce their cooling costs by raising their average ambient temperature. Not only does this reduce cooling energy costs but also the potential to reduce overall upfront HVAC equipment costs.

The XLM supercapacitor module helps keep data centers in operation without the loss of data or damage to equipment caused by power quality problems. Integrated with a UPS, the XLM reduces the total cost of ownership, from floor space and weight factors to reduction in operations and maintenance costs. The XLM is an optimal energy storage product for individuals desiring compact, low-maintenance bridge power.

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Cleveland, OH 44122
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