



Africa Data Centres partners with Eaton for flexible expansion project based on xModular

Location:

Johannesburg, South Africa

Challenge:

Implement data storage facilities and supporting power solutions into a legacy building with limited space

Solution:

To design, build, install, and commission the power modules to support the 10MW IT facility, which required 2.4MW prefab modular units

Results:

Eaton exceeded Africa Data Centres' expectations – while bringing a new solution to market

“This was the first project of this magnitude completed by Eaton Africa, with the company solely responsible for the concept, design, manufacture, installation, and commissioning of the xModular units, in a restricted space, and within a demanding timeframe”

*Armand van Niekerk
Data Centres segment lead at Eaton Africa*

When Africa Data Centres (ADC) expanded the world-class data centre facility in Midrand, ADC had specific requirements for the design and configuration of its new leading cloud providing, carrier and enterprises facility and the need for new supporting IT power solutions – all of which had to be configured to form part of a legacy building with many restrictions.

Eaton, a global power management company with a large design and manufacturing capability in South Africa, were awarded the tender to design, build, install, and commission the IT power modules to support the 10MW IT facility, which can be expanded further if required. The final design was for a 2.4MW xModular unit. The design exceeded ADC's expectations – while bringing a new solution to the African market.

At 2.4 MW, the ADC installation is currently Eaton's largest

xModular solution installed on the African continent and it positions Eaton as a market leader in providing turnkey power solutions, medium voltage switchgear, low voltage transformers, xEnergy low voltage power panel with low voltage switchgear, and world class UPS systems with lithium battery.

Background

ADC is Africa's largest network of interconnected, carrier- and cloud-neutral data centre facilities. With its team of international experts, it is known for rapid and secure data centre services and interconnections across the African continent. ADC's world-class facilities comply with a number of recognised global standards (ISO 9001, 14001, 22301, 27001 and 45001), and they are PCI-DSS compliant.

ADC also has sites in Samrand, Cape Town, Nairobi, and Lagos, and now has additional capacity at the Midrand site.



Powering Business Worldwide

Challenge

"The upgrade of the existing site to meet data centre requirements was planned to be completed in phases, and ADC sought a modular 'plug and play' approach to allow for an easy upgrade in the future, including extending the electrical infrastructure without interfering with existing services," says Armand van Niekerk, Data Centres Segment Lead at Eaton Africa.

"Due to the nature of our business, on-site installation time had to be restricted and would ideally be limited to final assembly and cable connections only," explains Stephane Duproz, CEO of Africa Data Centres. "This meant that components had to be configured for easy transport, and in such a way to avoid transit damage.

"Apart from physical requirements, we expected the solution to offer stability and reliability under all environmental and power supply conditions, in a robust prefabricated structure. Adequate load handling capabilities were essential, as well as ease of operation and maintenance," he adds.

The solution was expected to offer a total integration of Eaton products into one system and the approach and was intended to protect the data centre from the repercussions of inconsistent power supply and the ongoing 'load shedding', or power blackouts, that South Africa has become accustomed to.

Solution

Eaton worked in close collaboration with the extensive xModular partner network, to design, build, install, and commission a bespoke version of the Eaton xModular

configurable system. This power module or energy room was tailored to meet ADC's stringent requirements, providing a stable amount of available power in a short time frame on a limited footprint.

Its fully integrated turnkey solution included Eaton's Power Xpert UX withdrawable Medium Voltage Switchgear, the Eaton Power Xpert 9395P UPS, and Eaton's Lithium-ion battery combinations.

The air-insulated Power Xpert UX withdrawable Medium Voltage Switchgear offers W-VACi vacuum circuit breakers with world-leading vacuum technology on a compact footprint. A safe, reliable, and efficient choice for medium voltage switchgear, its solid cast-resin insulation technology, along with its AFLR internal arc classification make it an ideal solution for data centres.

"The Eaton Power Xpert 9395P modular UPS offers complete isolation of output power from all input power anomalies to deliver 100% conditioned, perfect sine-wave output, even during severe power disturbances," explains Lester Maritz, Lead Engineer for Data Centre Design and Application at Eaton EMEA.

"Its Energy Saver technology can improve efficiency levels up to 99% by suspending power modules when double conversion is not required, and can be switched to a double-conversion mode in less than two milliseconds when required, which can be used by the client should further savings in power consumption be a KPI" he adds.

This mode of operation produces 18% less heat rejection than predecessors and is designed for continuous operation at ambient temperatures of up to 40°C, without de-rating provided the

battery is kept at the required storage temperature. The UPS is easily scalable, the number of power modules can be specified, and the layout can be chosen to suit the installation. More than 90% of materials used in manufacture can be recycled, significantly reducing the lifetime carbon impact.

Eaton's lithium-ion battery systems provide a reliable and flexible solution that ensures 24/7 system uptime while delivering significant total cost of ownership savings. Capable of providing megawatts of power in a small footprint, this battery solution is comprised of lightweight battery strings designed to seamlessly connect to a Power Xpert 9395P or Eaton 93PM UPS.

The lithium-ion battery integrates a powerful battery management system, providing cell protection, cell balancing, state of charge and health and alarms/reports.

"Safety of personnel is paramount, so internal and external CCTV is installed for clear visibility within the module," says Maritz. "Access control with biometric scanning with HMI card recognition was also installed.

"While the modular units were designed to fit into a restricted space, they are still significant in size. Furthermore, the client requested minimal on-site manufacturing so the units had to be completed and tested to the highest international standards before placement," he continues.

"That's why Eaton built the modular units off-site with our xModular partner. Then managed the complex logistical project of delivering and rigging the weighty units by road, using specialised trucks and air-suspension loading trailers, and lifting them into place using specially hired 700 T cranes."

says Maritz.

Before the delivery process could be planned and executed, the Eaton team conducted a scenario based study, with safety as the top priority, followed by an in-depth review of the planned route, including using drone technology to identify risks such as low bridges, trees, and narrow roads. Permission and support from local road agencies were also secured.

Result

"This was the first project of this magnitude completed by Eaton Africa, with the company solely responsible for the concept, design, manufacture, installation, and commissioning of the xModular units, in a restricted space, and within a demanding timeframe," says van Niekerk.

The xModular system combines the benefits of customisation and configurability with industrial scale and controlled integration and fabrication. Ensuring the quality and fit for purpose nature of the resulting xModular units.

The design of the solution was so successful that Eaton can easily adapt it to duplicate and roll out similar fully integrated turnkey solutions in other similar situations.



Pictured (left to right): xEnergy, Lithium-ion battery and Power Xpert 9395P UPS

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