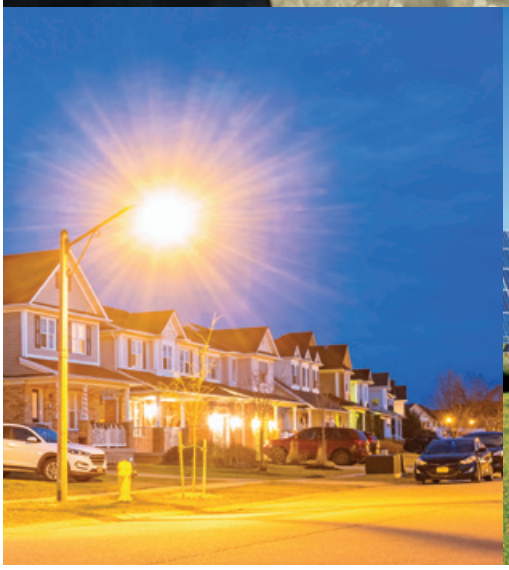
Product brochure

Grid automation system solutions



EATON

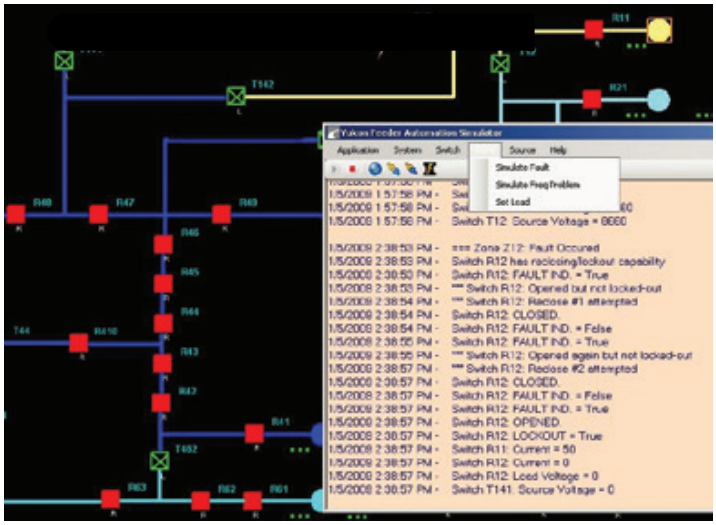
Powering Business Worldwide

Improve reliability, productivity and energy efficiency

Eaton's Smart Grid solutions provide utilities with the technology they need to build, transform, protect and connect their electric power system backbone. Integrated with enterprise-level software and secure communications, our comprehensive range of smart apparatus are designed to bolster productivity, optimize efficiency, improve system reliability and reduce costs. From the ability to monitor assets to automate meter reading to detect system disturbances, Eaton solutions help utilities plan, commission and develop successful programs that save money, improve performance, reduce maintenance and enhance safety.

Reliability and optimization solutions

Eaton understands that utility companies are under increasing pressure to improve reliability, minimize customer outages and optimize system performance—all the while bolstering operational efficiencies and slashing costs. Because our products have been specifically designed with those goals in mind, Eaton is uniquely qualified to help make your infrastructure smarter, more dynamic, and exceptionally resilient and secure. We can even optimize distributed generation resources and extend the life of existing assets.



Feeder Automation Manager

Leverage real-time data for improved reliability, faster restoration and minimized customer impact

Eaton's Feeder Automation Manager (FAM) software integrates real-time data to detect distribution system disturbances and automatically reconfigure the system, significantly improving reliability while reducing the number of customers affected. This advanced, dynamic self-healing software solution empowers utility engineers to easily change automation settings and perform service restorations in approximately 30 seconds to 2 minutes, significantly decreasing outage time, System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI).

Core features

- Fault management, voltage loss management and load management
- Simple configuration
- Self-healing system
- Server-based application with centralized communication architecture

Volt-VAR optimization

Voltage and power factor control for system optimization, energy savings and reduced power costs

Eaton's Yukon Volt/VAR management software applications monitor real-time voltages, watts and VARs from load tap changers (LTCs), regulators, capacitors, medium voltage sensors and additional monitoring points such as customer meters. These software applications help utility companies implement smart grid strategies while enhancing system optimization. Because these software applications support power factor and voltage management, the delivery of electricity is more efficient, higher quality and less costly—enabling utilities to benefit from a greater percentage of energy being delivered to paying customers, deferred installation costs for new generation plants and a greener energy footprint.

Core features

- Voltage and power factor control
- Conservation voltage reduction support
- Easy implementation, management, monitoring, maintenance and data importation with real-time visual displays, graphs, alerts and historical data
- Voltage management during forward and reverse power flow conditions due to renewables integration
- Optimized performance through collection and analyzation of real-time feeder voltages, watts and VAR flow from regulators, capacitors and other monitoring points

GridAdvisor™ Series II sensors

Achieve reliable outage detection and operational efficiency

Simple yet sophisticated, Eaton's GridAdvisor Series II smart sensor with integrated communications is designed to save utilities both operation and maintenance dollars by reducing drive time and keeping capacitors operating at peak efficiency. Hot stick-installable, the industry-leading sensors are the easiest way to gain SCADA visibility across your power distribution network. Accommodating all voltages, currents, overhead, padmount and vault applications in a single unit, the smart sensor meets or exceeds IEEE Std 495™ 2007 standards, making it suitable for both overhead and underground applications.

Core features

- Self-contained, conductor-mounted with patented Energy Harvesting technology
- Hot stick-installable on conductor sizes 0.25″ to 2″ diameter
- Real-time line monitoring at nearly any location via DNP3 protocol, with detection of directional fault targeting and capacitor bank fuse failure
- Communications flexibility with integrated CAT M1 / NBIoT (4G/5G) cellular modem and Bluetooth radio
- SCADA visibility
- Native DNP3 Protocol support

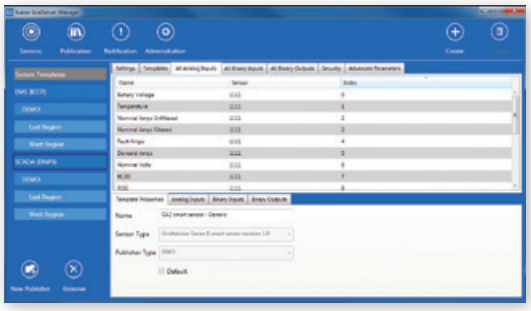
GridServer software

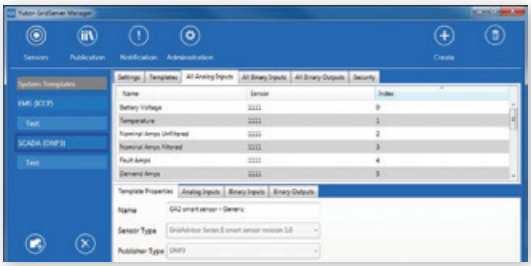
Simplify smart sensor integration and reduce complexity with powerful, secure tools

Using Eaton's GridServer software, utilities can dramatically simplify integration of their entire fleet of smart sensors, significantly reducing the number of operational hours required to set up, commission and integrate sensor data into various enterprise applications. Concentrating thousands of sensor connections into a manageable data set over a service-oriented architecture, GridServer software provides a secure data path into a utility's operations center. At the same time, the software reduces complexity by acting as a single point of integration to enterprise applications, managing data acquisition and brokering the appropriate points of interest to multiple back office systems. Meanwhile, the GridServer Manager client application provides an intuitive, powerful interface to help administrators quickly and easily manage their sensor assets, publication of data and user access to the system.

Core features

- Template-based configuration of sensor data points
- Intuitive drag-and-drop configuration interface
- Flexible data concentration of thousands of smart sensors
- Manageable data connection for SCADA or OMS using DNP3 or ICCP
- Leverages existing IT infrastructure with Active Directory integration





CBC-8000 capacitor bank control

Eaton's CBC-8000 capacitor bank control is designed to operate utility distribution feeder capacitors.

Offering increased security, simplified installation, reduced training and lower cost of ownership, the highly flexible control can be readily deployed in advanced automation schemes such as Eaton's Yukon Integrated Volt/VAR control, SCADA and distribution management systems.

Core features

- Modular, economical controllers support stand-alone functionality and a variety of communication configurations
- Three-phase power quality measurements
- Voltage control algorithm to address feeder voltage violations
- kVAR algorithm to optimize power factor to user-selectable target

Substation automation solutions

As utility automation systems have evolved from traditional RTUs to advanced distribution and substation automation systems utilizing multi-function automation platforms, Eaton has been at the forefront of this progression. Our extensive portfolio of products and technologies leverages 25 years of experience working to address utilities' greatest challenges. Specifically designed to help upgrade the electrical grid and strengthen infrastructure, Eaton's substation modernization solutions enable customers to achieve a dynamic, resilient and secure two-way grid — while improving reliability, reducing costs and enhancing safety.

Powerful, reliable and built for harsh environments

SMP SC-2200 computer platform

Gain powerful performance and rugged reliability in a compact design

Powerful, reliable and built for harsh environments, Eaton's SMP SC-2200 computer is specifically designed for automation project functions that require a general-purpose computing platform running a standard operating system. It can also be used as a powerful server running multiple applications deployed as virtual machines. With a compact and scalable substation-grade design, the SMP SC-2200 is able to withstand a wide temperature range, is immune to electrical surges and vibration, and features hot-swappable dual power supplies with no fans or moving parts.

Core features

- Dual hot-swappable power supplies and powerful multicore processor options
- Flexible hardware or firmware RAID configurations
- Wide input voltage range
- Flexible configuration and scalable, modular architecture
- Selection of expansion modules (Ethernet, Advanced Ethernet with PRP/HSR, storage, PCIe and PC)
- Demodulated IRIG-B input and output for time synchronization
- USB 3.0 interfaces for fast data transfer

Distributed I/O

Improve productivity and increase flexibility with rugged, substation-grade reliability

Specially designed to meet the requirements of distributed I/O in modern utility substation automation systems, Eaton's substation-grade SMP distributed I/O platforms integrate with the SMP Gateway or can be used as standalone I/O modules that connect directly to a DNP3 master station. Supporting binary input and output cards, as well as analog input cards, both devices operate with AC or DC voltage and communicate using the DNP3 protocol over serial RS-485 or TCP/IP using fiber or copper Ethernet. Error-detection features ensure data integrity between the data point and the control center, with supported IRIG-B synchronization for precise timestamping. In addition, all wiring resides on the rear panel through removable terminal blocks, with a front panel that displays the status of the device and the state of all I/O signal.

Core features

- Seamless networking facilitated through the SMP distributed I/O's Ethernet and RS-485 ports, and by relying on the industry-standard DNP3 protocol
- Supports IEC 61850 GOOSE messaging (SMP IO-2230)
- Integrated micro-PLC and full integration with the SMP Gateway management application for the SMP IO-2230
- The SMP IO-2230 complies with industry cybersecurity standards (certified under UL 2900-2-2)
- Designed for growth: up to 64 I/Os for the SMP IO-2230 and 32 I/Os for the SMP I/O
- Part of the Eaton RTU replacement solution

SMP Gateway

Future-proof your substation-grade automation system with exceptional performance, reliability, flexibility and security

One of the most advanced automation platforms in the industry, Eaton's SMP Gateway combines all the functions required by modern automation systems, including innovative functionality, high reliability and scalability in a single powerful package. In addition to providing data concentrator, protocol translator and logic processor functions, the SMP Gateway features an integrated HMI and facilitates secure remote access for maintenance to substation and field devices, reducing operating costs and increasing productivity. Available in a number of models to meet a wide variety of application requirements, the substation-grade SMP Gateway reduces engineering efforts through a comprehensive set of field-proven tools, as well as fast configuration changes and reboot cycles.

Core features

- Cybersecure, helps comply with NERC CIP requirements
- Flexible, highly reliable automation platform that can be used as a data concentrator, protocol translator, microgrid controller substation HMI, etc.
- High interoperability to support industry standard and legacy protocols (up to 80 protocols supported)
- Supports evolution of automation products with robust, scalable design
- Field-proven tools include protocol analysis, detailed logs and commissioning tool.
- Flexibility and performance across applications

IED Management Suite software

Provide utilities with the capabilities to cost-effectively and securely monitor, control and collect data from substation devices as well as managing their substation devices effectively.

Eaton's advanced substation automation solutions support utility investment in modernizing and securing substations. The IED Management Suite (IMS) manages configuration settings, passwords and firmware for intelligent electronic devices (IEDs) used in substation and distribution automation systems. It reduces maintenance costs through secure remote access and helps comply with NERC CIP.

Core features

- Manage device configuration settings, passwords, firmware and setting updates
- Track IED inventory and log all changes
- Develop compliance reports and auditable logs
- Secure remote access to IEDs
- Retrieve power system events, fault records, SOE and oscillography from protection relays and DFRs
- Retrieve real-time operational data for asset monitoring and business intelligence

Visual T&D software

Visual T&D is a cost-effective PC-based substation historian solution with advanced HMI and SCADA capabilities.

Used for control, data logging, visualization and alarm management, Visual T&D is perfectly suited for applications requiring more capabilities than the SMP Gateway integrated HMI and still remains a cost-effective and secure solution which can be used as a standalone or as a companion to the SMP Gateway. It integrates seamlessly with the latter to provide immediate access to substation data.

Core features

- Support a large variety of data sources
- Millisecond time-tagging
- Support server redundancy for continued error-free operation
- Flexible licensing model
- Logs all events, alarms, operator actions and all transitions of all data points in a high-performance historian
- Automatically retrieves event files
- Power industry shape libraries for simplified diagram creation

To learn more, visit
Eaton.com/smartgrid

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