Optimize Efficiency, Productivity, and Reliability

Smart Solutions. Smarter Grid.

COOPER Power Systems
Cooper Power Systems can be your end-to-end partner to smooth your transition to a Smarter Grid.

**Evolving Requirements**

Energy customer expectations are increasing. Customers are more informed, more connected, and more accustomed to intelligent devices that put them in control of the services they receive. They want high reliability in their energy supply for less cost. They are more environmentally aware, and they are willing to conserve to achieve this ideal.

Power providers need to meet current needs while planning for future changes in technology, regulations, and customer requirements. Our solutions integrate with legacy products on your network to improve efficiency, productivity, and reliability.
WE DELIVER ON YOUR CUSTOMERS’ EXPECTATIONS:

• Higher levels of service through customer access, system reliability expertise, and smart integrated control systems
• Improved energy management creates costs savings
• Reduced environmental impact through peak-shaping and network optimization

WE PROVIDE REAL IMPACT TO YOUR BOTTOM LINE:

• Optimized efficiency through system planning tools, integrated control, data access, and energy efficient apparatus
• Improved productivity of your assets and people through remote system monitoring and control
• Greater reliability with a system approach utilizing intelligent apparatus and self-healing grid solutions
• Prepared for the future with modular, integrated, and upgradable solution architecture
Cooper Power Systems: Smart Solutions for a Smarter Grid.

Cooper Power Systems Smart Solutions begin with intelligent field apparatus that monitor and respond to system parameters, and which can be configured to operate locally, or be monitored and controlled remotely. Our software platform comprises a suite of modules for energy optimization and control. Our flexible approach to communications utilizes the best technologies to, cost-effectively, meet application and service area requirements, ensuring that data is transmitted to and from apparatus and enterprise systems.
Because Cooper Power Systems offers a comprehensive portfolio of power distribution equipment, controls, software, communications networks, and engineering expertise—backed by 100 years of field-proven experience and financial stability—we are uniquely positioned to provide integrated solutions to make your grid Smarter.

WE PROVIDE THE EFFICIENCY, PRODUCTIVITY, AND RELIABILITY SYSTEM SOLUTIONS YOU NEED:

- Advanced Metering Infrastructure
- Demand Response
- Engineering Analysis, Optimization, and Modeling Tools
- Self-Healing Grid
- Substation Automation
- Volt/VAR Management
Efficiency

**Demand Response (DR)**
- Implementing the Cooper Power Systems Demand Response solution on as few as 8000 home air conditioners can reduce annual system losses by 51,000 kWh
- Field-proven solutions with more than 3GW under control
- Communication flexibility—such as ZigBee® AND radio data systems (RDS), Wi-Fi, power line carrier (PLC), 900 MHz FLEX, and POCSAG VHF paging
- Device alternatives—offering multiple load control relays or switches, in-home indicators, and programmable communicating thermostats
- Consumer DR portal enables consumers to remotely control smart thermostats and monitor consumption data, empowering them to participate in conservation

**Volt/VAR Management**
- Improving power factor in the distribution system could save a medium utility up to 2,570,000kWH annually
- More than 75 years experience designing and manufacturing capacitors, voltage regulators, and integrated controls
- Capacitor Bank Control (CBC) and Yukon centralized software since 2001
- Support for multiple communication networks
- Real-time automated adjustment provides unmatched depth of functionality

Productivity

**Advanced Metering Infrastructure (AMI)**
- Communications technology for all service territories—RF, PLC, cellular, and blended solutions
- 2.5 million AMI network nodes—installed and supported
- True “free agent” offering flexible choice of—and support for—electric, water, and gas meters
- Only Smart Grid AMI vendor with true distribution experience
- Resilient, fault-tolerant networks that support DR, critical peak pricing, and distribution automation applications

**Engineering Analysis**
- Best-in-class modeling capabilities with CYME™ planning software
- 5000 installed seats in 100 countries
- Experienced power systems engineering team
- Condition monitoring in reclosers and regulators interfaced through Yukon™ software for smarter predictive maintenance
- Reliability assessment, load flow, grounding, arc flash, devise coordination, distributed generation integration and impact, capacitor, recloser, and voltage regulator placement
Reliability

Self-Healing Grid
- Reclosers and switches with Yukon™ advanced energy services platform improves SAIDI, and restores power—typically under 60 seconds
- OutageAdvisor™ smart sensors detect and report outages, and integrate with SCADA or Self-Healing Grid Solutions
- VARAdvisor™ monitors fixed capacitor banks, and reports in when banks go offline
- Automated centralized or decentralized control
- Cooper Power Systems has been a leader in Distribution Automation Solutions for more than 60 years

Substation Automation and Security
- Broad substation offering includes substation reclosers, breakers, voltage regulators, capacitor banks, arrestors, controls, relays, and Substation Modernization Platform (SMP) gateways
- More than 100 protocols supported in SMP with thousands of SMP Gateways in service
- Leader in IEC 61850

Integration

Solutions for Systems Integration of Field Assets and Existing Enterprise Software
- Yukon advanced energy services management software platform supporting a suite of applications, including Advanced Metering Infrastructure, Demand Response, apparatus control, Integrated Volt/VAR Control, Self-Healing Grid, and substation automation for optimized system control
- Interfaces to more than 30 systems, including Meter Data Management Systems (MDMS), Customer Information Systems (CIS), Graphical Information Systems (GIS), Outage Management Systems (OMS), Engineering Analysis (EA), and Supervisory Control and Data Acquisition (SCADA)
- Solutions built from the ground-up with security in mind
- Exceeds North American Electric Reliability Corporation (NERC) standards for Critical Infrastructure Protection (CIP) for identification and protection of critical cyber assets
Capacitors and Controls
Capacitors improve power quality, reduce losses, maximize generation, and help reduce CO₂ emissions. Centralized capacitor control solutions help utilities that have grid constraints, reliability issues, or a need to reduce operation and maintenance costs. Designed for worldwide utility and industrial applications for system voltages from 2.4 kV through EHV.

Voltage Regulators and Controls
Regulators and their closely coupled controls provide fast response to changes in voltage, improve power quality and system efficiency, and lower operating costs. Fully configurable, programmable logical I/Os ensure the Cooper Power Systems regulator is SCADA-ready.

Switchgear and Controls
Integrated intelligence enables switchgear to sense and interrupt fault currents, then automatically restore service after momentary outages. Integrated protocols, logic sequences, or other high-end features make switchgear integral to feeder automation systems.

Substation Gateways and Relays
Robust, secure, and flexible data acquisition platform that bridges the gap between substation and automation systems, gateways provide essential communication and data concentration features. Relays are a reliable automation and integration platform providing protective and response functions. Programmable logic allows users to incorporate sophisticated, custom functionality.

Modular Integrated Transportable Substation (MITS)—Capacitors, Reclosers, and Transformers
An electrical power distribution substation or other grouping of electrical equipment assembled and fully integrated at the factory on a self-supporting structural base, or mounted on a D.O.T. compliant trailer for mobile applications. Saves cost, time, space, and labor.

Faulted Circuit Indicators and Smart Sensors
Reduce operating costs and service interruptions by identifying the section of cable that has failed, or by detecting blown fuses on switched and fixed capacitor banks. Smart sensors deployed across the distribution system monitor data, and leverage existing communications infrastructure that may include AMI and/or public cellular networks to provide additional points of system data.

Advanced Energy Services Software Platform
Our Yukon suite of applications includes Advanced Metering Infrastructure, Demand Response, Capacitor Bank Control, Integrated Volt/VAR Control, Self-Healing Grid, and substation automation for energy optimization and control.

Engineering Analysis, Optimization and Modeling Software
Extensive line of Power Engineering Software that features some of the most advanced analysis tools available for transmission, distribution, and industrial power systems. Complemented by a suite of services for power system engineering studies and IT integration to enterprise systems like GIS and SCADA for enhanced modeling and simulation.

Advanced Metering Infrastructure
Combine Advanced Metering infrastructure with Demand Response, Intelligent Capacitor Control, and Distribution Automation for energy control optimization.

Demand Response Devices
Best-in class portfolio of programmable, communicating thermostats and load control relays for residential, commercial and industrial loads. Proprietary cycling technology maximizes load reduction per device. Flexible communications capabilities, including one-way, two-way, PLC and RF (paging, VHF, ZigBee, WiFi), and dual-radio devices.
## SMART SOLUTIONS

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<td>Demand Response Devices – Enterprise Software, T-Stats, Switches, In-Home Indicators, and Displays</td>
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An electrical utility has implemented a Cooper Power Systems Yukon Feeder Automation self-healing system that includes six sources feeding 18 reclosers and switches, as well as integration with a central Distribution Management System (DMS). This automation solution preserves the customer’s standard protection schemes and operating procedures, ties together diverse intelligent electronic devices (IED) and protocols, and allows non-scripted configuration and the future addition of new devices. The system utilizes controls with integrated sensors, communications, and real-time distribution data to isolate faults, and reconfigure feeders to minimize service disruption.

CASE STUDY 1  Self-Healing Automation

Today, utilities maintain installed apparatus and controls, and create operational plans to deliver energy at a planned power factor, and in an acceptable voltage range. A large utility evaluated Cooper Power Systems technology to take a big-picture view of capacitors and voltage regulators to better optimize voltage and VARs. The business case for conservation voltage reduction is complex. Utilities save on the cost of fuel and emissions, and additional peak generation, and customers pay less for their electricity. This utility first substantiated a business case for technology investments through the use of Cooper Power Systems CymDIST distribution planning powerflow. Second, the utility deployed capacitor banks, regulators, and Yukon Volt/VAR Management—including Integrated Volt/VAR Control—supporting peak load reduction through voltage reduction, and 24/7 load reduction through voltage reduction. An additional benefit included remote identification of capacitor bank failures in order to achieve the operational benefits substantiated in the CymDIST planning studies.

CASE STUDY 2  Volt/VAR Control
A utility desired both Advanced Metering Infrastructure and Demand Response solutions to be integrated seamlessly, and operate synergistically with multi-phase implementation to be deployed over the company's service territories within a three-year period. The utility had more than 3100 miles of line, and wanted an AMI solution that would allow for future growth as well as enable high-speed PLC technology as a cost-effective method to communicate with all of its 16,000 meters. The AMI system solution provided by Cooper Power Systems was fully deployed in 15 months. Since implementing this system solution, the utility has eliminated nearly 1300 monthly meter reading corrections as well as a 5- to 10-day billing latency. Other AMI solution benefits include tracking blinks against detected faults to resolve issues before they become outages, compiling ongoing analyses to determine needed service changes, monitoring voltages to identify equipment malfunctions, and isolating outages. Phase II of the implementation will deploy the DR solution. The utility's future DR solution deployment will include load control receivers, in-home indicators, programmable communicating thermostats, and an Internet consumer access portal.

A transmission company with more than 2,500 miles of transmission line, and having access to approximately 16,000 additional miles of line through an integrated transmission system, was seeking a solution that would provide access to real-time data from their IEDs. The company had earlier upgraded its WAN to make it a Frame Relay network, but cooperative members needed access to relay data that was still not available via traditional SCADA. The cooperative implemented a Cooper Power Systems substation solution with the Event Manager module of the Yukon IED Manager Suite. This solution utilizes the Frame Relay network to retrieve data and event files from existing relays, SER and DFR devices, and stores the data in an industry-standard database. In substations where an SMP Gateway is installed, event files are “pushed” to Event Manager and processed as soon as they are detected, automatically notifying key personnel via e-mail. For other substations, Event Manager either performs scheduled or on-demand data acquisitions. Since implementation, the company's SAIDI and SAIFI indices have improved by 25 percent, and Event Manager has been providing 40 key users with real-time access to fault information.