



## Smart grid ready capacitor bank control delivers automation and efficiency

This state-of-the-art integrated volt/VAR intelligent control is built to easily adapt to emerging changes you can expect from the Smarter Grid. Available as a single, stand-alone field device or an entire automation solution, the CBC-8000 easily integrates with radios and radio networks, and is designed with a full suite of deployment options to enhance grid efficiency and power quality.

Maximize distribution system energy efficiency and power quality with the CBC-8000 capacitor bank control and two-way communications. Eaton's Cooper Power Systems Smart Grid technology uses Volt/VAR management products for energy efficiency and conservation voltage reduction (CVR) to reduce generation demand and energy consumption while maintaining customer voltage power quality. Effective operation of down-line distribution capacitors optimizes the feeder voltage profile and minimizes VAR flow – a crucial element to successful energy management and greater return on investment.

The Eaton's Cooper Power Systems CBC-8000 capacitor bank control is a member of a line of fully integrated controls which feature a modular, universal design, capable of being deployed with various communications configurations to meet differing application needs. The control strategy is based on field-proven algorithms and utilizes Eaton's Cooper Power Systems standard front

panel and **ProView™ NXG** application software. Each CBC-8000 control can act as a stand-alone, one-way, or two-way communicating device with advanced distribution automation features and communication loss capability.

This smarter grid control is designed for:

- Increased efficiency in energy delivery
- Flexible, easy to use communications
- Improved productivity
- Enhanced power quality

### **CBC-8000 control — the smarter choice**

Utilities need intelligent solutions to improve distribution system voltages and power factor in order to reduce generation demand to achieve significant energy savings. The CBC-8000, a truly scalable capacitor bank control, uses selectable control strategies and communications to enable users to control their systems in the optimum manner. The CBC-8000 control can adapt and grow as your system does, without hardware upgrades.



# Cooper Power Systems

by **EATON**

## Flexible, easy-to-use communications

The CBC-8000 control is specifically designed for remote operation and retrieval of field measurement data for analysis by integrated Volt/VAR applications. Benefits from this highly flexible and programmable control include:

- Easy integration into a variety of communication radios, radio networks, SCADA and modems
- Communications data log to quickly debug communication problems
- Communication loss fail-safe modes for grid stability
- Unsolicited reporting of state change, field alarms or threshold violations for easy monitoring
- Available radio-ready or with utility radio installed at factory
- Control configurations upgradable or downloadable through Eaton's Cooper Power Systems **ProView NXG** software
- Meets IEC standards supporting 120/240 Volt and 50/60 Hz electrical systems for global applications



**CBC-8000 control shown with wireless modem, one of many communication methods available.**

## Improved productivity

- Reduce time in the field, and operating costs with remote control, scanning, programming and data log downloads over the utility's secure network
- Improve productivity with remote, over-the-air firmware and settings updates by eliminating site visits and reducing maintenance efforts:
  - Simplified installation
  - Less training needed
  - Highly flexible operational settings
- Remote retrieval of over 100 unique analog data points:
  - Engineers can select up to 100 data points
  - Data logged into data log/sequence of events (SOE)
  - Can be retrieved remotely from utility's back office - no need to visit the control site

## Three-phase power quality measurements

- Monitors every aspect of site's health with full three-phase voltage, current, VAR and harmonic monitoring as well as capacitor bank neutral current monitoring via analog inputs for greater accuracy
- Offers refined power quality event monitoring—in the event of problems or grid anomalies that may need detailed analysis
- Allows utility to monitor and improve customer's power quality
  - ANSI C84.1-2011 phase-to-phase voltage unbalance monitoring and reporting
  - Know all three phases of the capacitor are operational with Eaton's three-phase bank operation confirmation algorithm



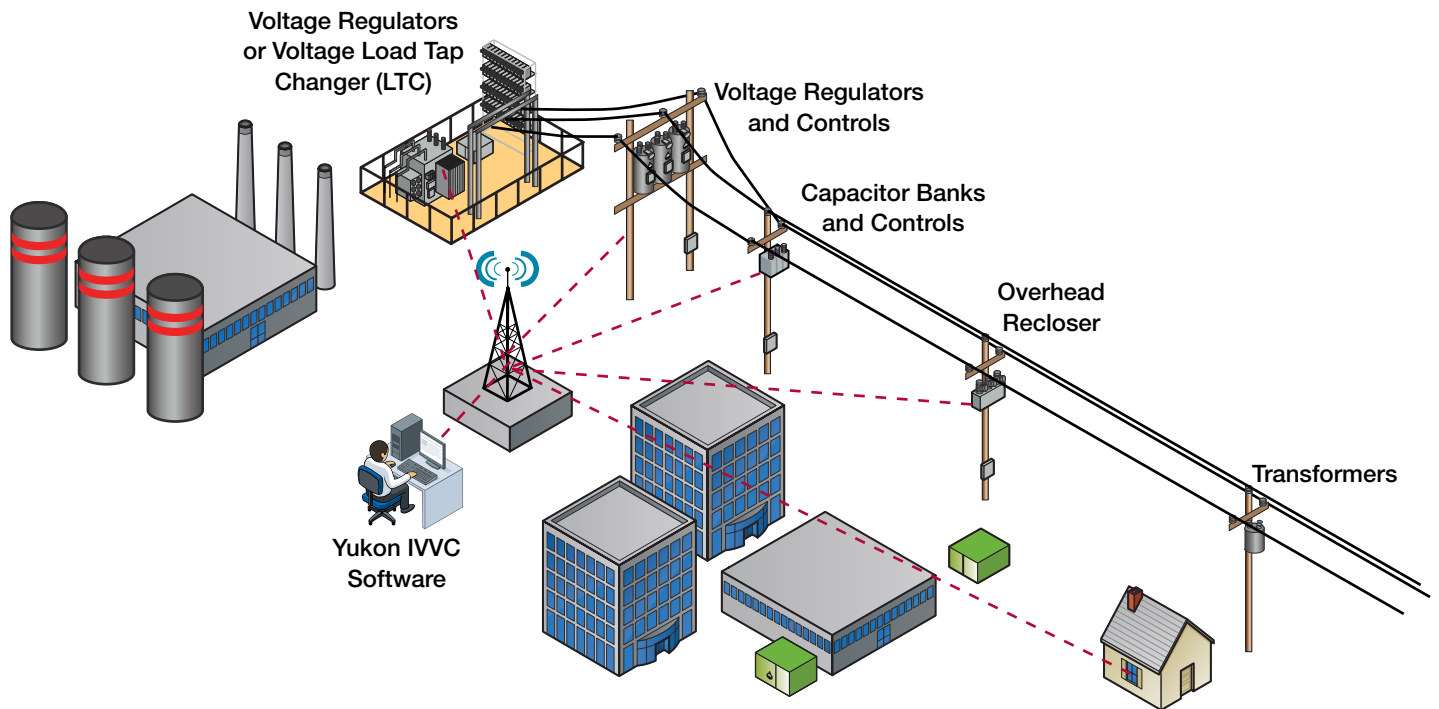
**Save time and money with remote field configuration and capacitor bank operation.**



**The CBC-8000 control can be used with pad-mounted or overhead capacitor banks.**



**Improve productivity with simplified installation.**

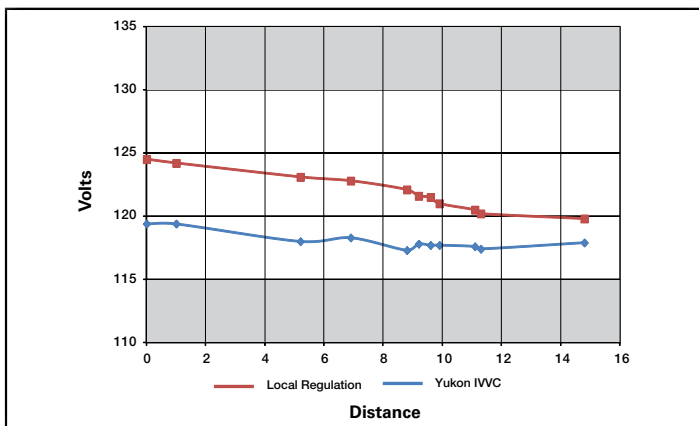


### Distribution automation solution

Eaton's Cooper Power Systems offers the full suite of power quality software and apparatus to support your Volt/VAR management solution. With unparalleled expertise to make your automation seamless we offer:

- Yukon™ Volt/VAR management automation software
- CBC-8000 capacitor bank control
- Pad-mount or rack-mount capacitor banks
- CL-7 voltage regulator controls
- Voltage regulators
- Recloser controls

### Voltage Profile: Local Regulation vs Yukon IVVC



### Optimal feeder voltage

Yukon Volt/VAR Control (IVVC) software uses capacitors and regulators to flatten the feeder voltage profile. The capacitor acts as both a voltage and power factor device to deliver the optimal feeder voltage profile. The graph below represents the Yukon IVVC software flattening the voltage profile – resulting in a reduction in bus voltage from 122 to 118 volts.

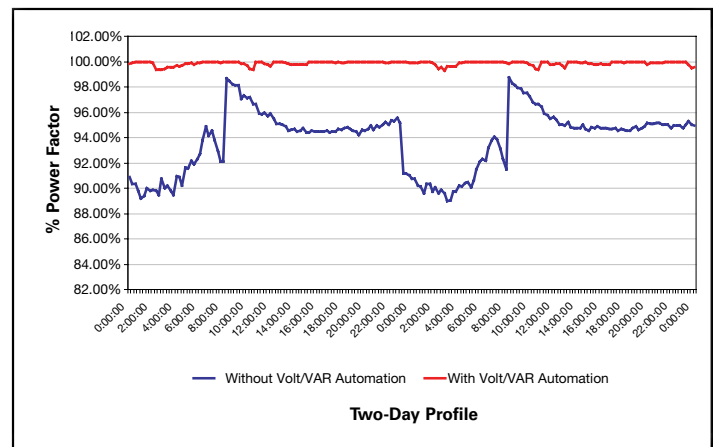
### Power factor correction

Power factor correction is a crucial element in improving energy efficiency and reducing losses. Capacitors are used to correct the distribution feeder VAR flow. The graph below represents before and after effective implementation of Yukon Volt/VAR management software.

### Power system studies for optimized results

Maximize the benefits from implementing a Volt/VAR management application with Eaton's Cooper Power Systems CYMET™ Engineering Services team. We offer power system studies to identify the best combination of regulation equipment to optimize feeder voltage profiles and substation VAR management.

### Power Factor





# COOPER Power Systems



The CBC-8000 control is specifically designed to operate utility distribution feeder capacitors. This highly flexible control can be deployed in a number of operational strategies using site metrics, which include voltage, VARs, current, temperature and time control configurations.

### Key operating features

- Trip and close operations
- Local or remote control of capacitor banks
- Voltage threshold monitoring
- Programmable time delays for close, trip and re-close operations
- Independent control parameters

### Key two-way communication features

- Confirmation of trip and close action
- Real-time scanning
- Site alarm notifications
- Neutral current sensor (optional)

1. Left-side LEDs to indicate capacitor information

2. Ten-key programming area with LCD display

3. Right-side LEDs to indicate control information

4. Bottom color-coded area for operating the control

5. Trip/close push-buttons with visual indication

6. One-touch mode keys

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