



Volt-VAr Management Software (VVMS) for smart grid distribution automation applications

Features and benefits

Savings

Savings in excess of \$4-\$6 million annually have been reported by medium to large utilities managing 2000-3000 switched capacitors. Improved power factor reduces the cost of energy needed to produce a given customer revenue. Improved power factor releases infrastructure capacity making it possible to defer or to better control substation and feeder construction projects. VVMS software also encourages more efficient use of crew resources through best-effect maintenance prioritization.

Deployment speed

VVMS can begin delivering savings right away. Depending on your distribution automation and communication choices, VVMS can be operational in as little as a month. We work with your technology staff (IT, Scada, and communications) and with a cap controller vendor that you select to configure VVMS compatibly within your organization's distribution automation plan.

VVMS acquires load, voltage and connectivity data from Scada, Pi Historian, two-way DNP3 devices as well as from AMI metering, GIS/OMS and other relevant resources. Our staff consults with your staff to determine the most beneficial integration.

Utility crews have found VVMS contributes to rapid deployments. Cap crews at CenterPoint Energy, Houston, for example, recently installed 5000 capacitor controllers at the remarkable rate of 30 caps per day. This rate was accomplished inclusive of inspecting and rehabbing existing capacitor assets and installing new capacitor banks.

Hardware compatibility

VVMS automation may be used with cap controllers and voltage control hardware (LTC's and VR's) from all major hardware suppliers, for example:

- ABB
- Beckwith Electric
- HD Electric



Features and benefits

Communications alternatives

ABB's VVMS interoperates with many types of networking technologies for two-way or one-way monitoring and controlling of Capacitors, Transformer LTCs and Voltage Regulators. These technologies include:

- TCP/IP, UDP/IP
- DNP3
- FHSS (GE MDS, Freewave, etc.)
- Public Cellular (Verizon®, etc.)
- Private Cellular
- Power Line Carrier
- SilverSprings Networks
- Telemetric
- Utilinet
- Cellnet
- Direct VHF
- Flex Paging
- and more

Utilities may choose to concurrently utilize any combination of these technologies for accessibility to remote equipment in all locations.

Web ready

VVMS facilities are conveniently accessible to authorized viewers from anywhere via internet browser. Our web client provides comprehensive design and operating facilities with easy to follow real-time graphic display of stations, feeders, LTC and cap conditions. (See Figures 1-3.) It incorporates our intuitively powerful "Reactive Report Generator" that sorts out historic and real time information as you wish and delivers it on-line or downloaded to your own computer.

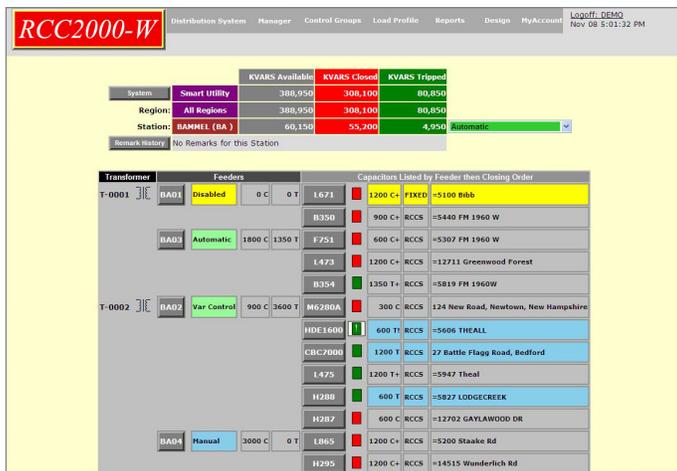


Figure 1 VVMS Substation screen depicting LTC, Feeder and Capacitor association.

Operation with paging and VHF radio systems

VVMS uses SNPP protocol to communicate directly with paging servers and commercial paging services equipped to send Flex or other pager protocols. VVMS has considerable experience with VHF radio systems. We consult your radio shop to understand your FCC license provisions, transmitter configuration and we assess its suitability for use with VVMS.

By supporting both legacy one-way technologies and newer two-way capabilities simultaneously, the ABB VVMS enables utilities to migrate to the new technologies at their own pace while managing only one Volt-VAR system.

Connectivity Model management

Our "asset update" can automatically build and maintain your VVMS application database from your utility's equipment records (Asset Management System) and then automatically adjust to connectivity reconfigurations from your GIS/OMS data source.

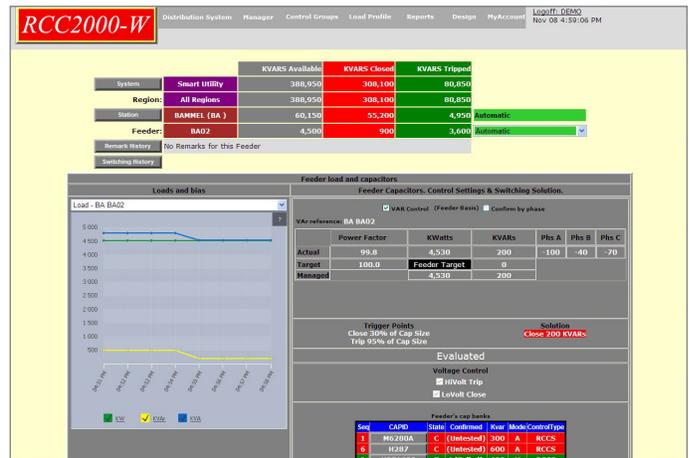


Figure 2 VVMS Feeder screen showing target vs. actual Power Factor

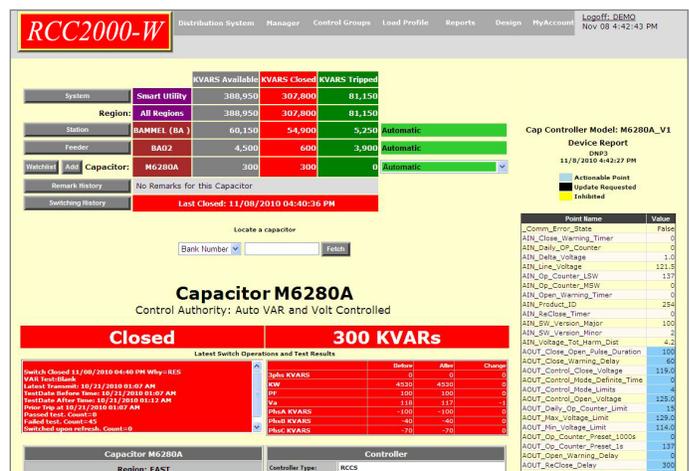


Figure 3 VVMS Capacitor screen

ABB distribution capacitors

Power capacitors

These banks provide an economical way to apply capacitors to a distribution feeder system to provide voltage support, lower system losses, release system capacity and eliminate power factor penalties. They are factory pre-wired and assembled, ready for installation.

Available options:

- In-line aluminum or galvanized steel rack vacuum or oil switches
- Normal and heavy duty design capacitors
- Junction box
- Switching controller – local and remote
- Line and neutral current sensors
- Wildlife guards
- Insulated conductor
- Control power transformer
- Distribution class arresters
- Fused cutout
- Current limiting reactors



Qpole

The ABB 'Qpole' pole mounted capacitor system is an economical solution for shunt reactive compensation on overhead distribution networks. The Qpole is suitable for use in networks up to 34.5kV grounded.

Benefits:

- Power factor correction close to customer loads
- Voltage stability
- Increased network capacity
- Cost saving through lower losses

The Qpole is available as a fixed or switched system depending on the network profile. Fixed banks are for systems with relatively constant var loading, while switched banks are more suited for systems with variable var loading.

The fixed and switched system utilizes ABB single phase capacitors arranged in grounded Y, ungrounded Y or delta configurations.

The switched system utilizes the complete range of ABB components including capacitors, vacuum switches and var controller. Optional ABB equipment including potential transformers, current sensors, surge arresters and fuse cutouts are also available.

The Qpole is a factory pre-wired assembly with a welded aluminum rack, suitable for pole mounting. All high voltage wiring has insulated tubing and outdoor bushing terminals are provided with bird guards for increased safety and reliability.

The Qpole is unique in that it offers customers a complete 'one stop shop' solution which has all the major components manufactured by ABB. Each component is manufactured to a relevant international standard (IEEE-18, CSA, IEC, etc.).

Customers have peace of mind knowing that the Qpole has been manufactured to the highest quality and environmental standards with ISO9001 and ISO 14001 certified facilities.

ABB distribution capacitors



PS15 capacitor switch

The PS15 is a solid dielectric vacuum switch suitable for use in distribution systems up to 38kV ungrounded (and 66kV grounded). The switch has been specifically designed and tested in accordance with ANSI C37.66 for heavy-duty operation in capacitor-switching applications for the harshest climatic conditions.

Benefits:

- Vacuum technology
- Superior HCEP solid dielectric insulator technology
- Magnetic actuator leads to few moving parts
- Maintenance free
- 50,000+ CO operations ensure long life
- Stainless steel 304 housing for normal and coastal locations



CQ900 Smart Controller

ABB's CQ900, the next generation in smart controllers, is designed specifically for capacitor applications. They feature an extensive range of control modes including remote, automatic and manual control. The automatic mode includes VAR, time, temperature, current and/or voltage control, as well as combinations of these. In addition, the CQ900 includes measurement and monitoring capabilities and useful features such as a 10,000 event data log for easy analysis and troubleshooting.

The CQ900 is now equipped with communication via the RS232 and Ethernet interfaces which can be used with a wide range of modem devices. The main communication protocol is DNP3.0 with IEC 61850 to follow. The enclosure is designed to allow standard modems to be installed and powered from within.

Introducing ABB SmartLink

The CQ900 has a secure wireless feature allowing local control, interrogation and programming from a linesman's vehicle, providing added safety and comfort for operators.

Other desirable features included on the controller are flash upgradable capability, a neutral current sensing option and test plugs, as well as a large, four-line LCD screen. The user-friendly interface and sizeable keypad allows for easy operation at any time of the day.

A durable IP 54 stainless steel enclosure provides added protection for even the harshest weather conditions, while the internal circuitry is protected by heavy duty surge protection. The unit is fully FCC (Part 15, class B) and ROHS component compliant.

The ABB CQ900 smart controller is an easy-to-use, feature-packed controller designed to offer customers true value through smarter management of their electrical systems and reliable integration with Smart Grid systems.

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