

BENNETTSVILLE COMMUNITY MICROGRID

POWERSECURE COMMUNITY MICROGRID PROVIDES HURRICANE RESILIENCE AND UTILITY PEAK-SHAVING



PowerSecure

LOCATION

Bennettsville, South Carolina USA

OBJECTIVE

22.5MW Community Microgrid
Peak Shaving, Island Operation Modes

Expand PowerBlock® generation module capability to support utility-scale community microgrids

SOLUTION

Woodward Controls:

- easYgen GC-3000XT Group Controller
- easYgen 3500XT Genset Controls
- LS-5 Circuit Breaker Controls

RESULTS

PowerSecure created the 22.5MW microgrid using PowerBlock modules and the easYgen Group Controller, owning and operating the facility at no additional cost to the utility (resilience paid for through reductions in coincident demand charges). The community now has resilient power during severe weather.

CUSTOMER GOAL

The community of Bennettsville, South Carolina faced the effects of yearly storms on the eastern seaboard and was driven to action by Hurricane Michael. The Marlboro regional cooperative utility, working with the Bennettsville municipal utility, considered their options for energy resilience that could enhance the region's economic competitiveness.

The municipal and regional utilities turned to PowerSecure, a Southern Company subsidiary and leading provider of microgrids, to provide a technically effective and fiscally responsible solution. PowerSecure proposed a 22.5MW microgrid solution using standard generation modules integrated directly into the City's substation with automatic throw-over and island-mode capabilities. The microgrid would also operate parallel to the grid to manage transmission coincident peaks and their associated costs.

PowerSecure's goal was to meet the needs of this community microgrid with a standardized generation solution that would scale well to all communities and create efficiency in engineering, manufacturing, commissioning, operation, and support.

SOLUTION

PowerSecure has transformed Commercial and Industrial (C&I) standby and microgrid markets in recent years through their innovative ownership models and modular approach to generation. At the heart of their C&I solutions is their

Bennettsville Microgrid Site



PowerBlock® generation concept, comprised of a standard container with between one and five standard engine generator sets, each powered by a Volvo 625kW Tier 4 Final engine and operating in parallel. Each PowerBlock flexibly adapts to the power needs of grocery stores, gas stations, community centers, hotels, and other C&I businesses with power ranges from 600kW to 3125kW.

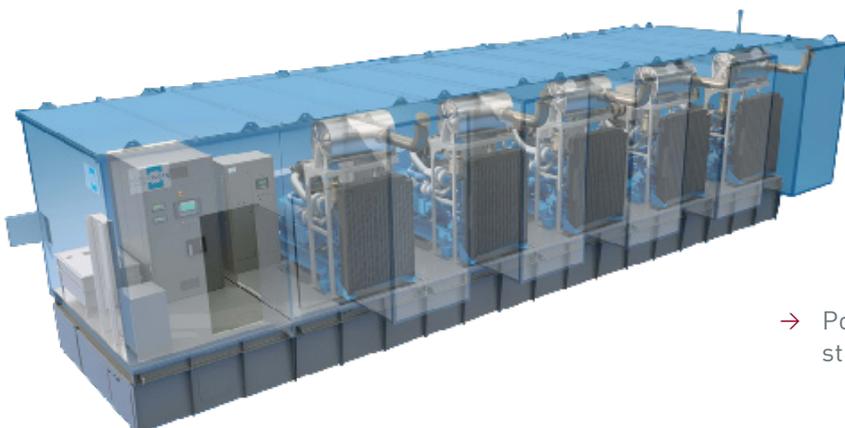
Multi-megawatt community microgrids require several PowerBlocks managed seamlessly to provide the flexibility needed for those operational requirements. PowerSecure turned to Woodward to provide the solutions that would retain the standardization and scale to the larger sizes.

Woodward's easYgen XT power management controls are already used in PowerSecure's C&I backup power solutions but new capabilities were needed to manage the multi-megawatt size of community microgrids such as Bennettsville.

Woodward created the easYgen GC-3000XT Group Controller to expand the capabilities of the easYgen XT controls for larger systems such as the Bennettsville microgrid. The Group Controller provides a scalable multi-master control to coordinate groups of up to 31 easYgen-3000XT equipped gensets, each with a corresponding Group Controller. The easYgen XT controls

"WOODWARD HAS LONG BEEN A TRUSTED PARTNER FOR POWERSECURE. THEY WORKED CLOSELY WITH ME AND MY TEAM TO EXPAND THE CAPABILITIES OF THE EASYGEN XT PLATFORM TO SUPPORT OUR CONTROL REQUIREMENTS FOR THESE LARGER MICROGRID SYSTEMS."

**ROB STONE | ENGINEERING MANAGER
POWERSECURE**



→ PowerSecure PowerBlock®
standardized, modular solution

manage within the group, and the Group Controller manages each group, acting like a “Big Genset” control to the other Group Controllers. Through the decoupling of the overall data flow, the bus bandwidth is kept low and the single genset operation is kept safe. The Group Controllers manage each generator group to provide overall system control and start-stop sequencing for hundreds of gensets. In addition, simulation and commissioning tools simplify the configuration and validation of the entire system.

Woodward and PowerSecure collaborated closely throughout the Bennettsville project to ensure the Group Controller features met their needs for functionality and standardization. The collaboration also led to opportunities to simplify the system design through easYgen software changes to enable PowerSecure to reduce instrumentation and wiring to decrease package complexity, save money, increase velocity through the assembly floor, and reduce commissioning time.

RESULT

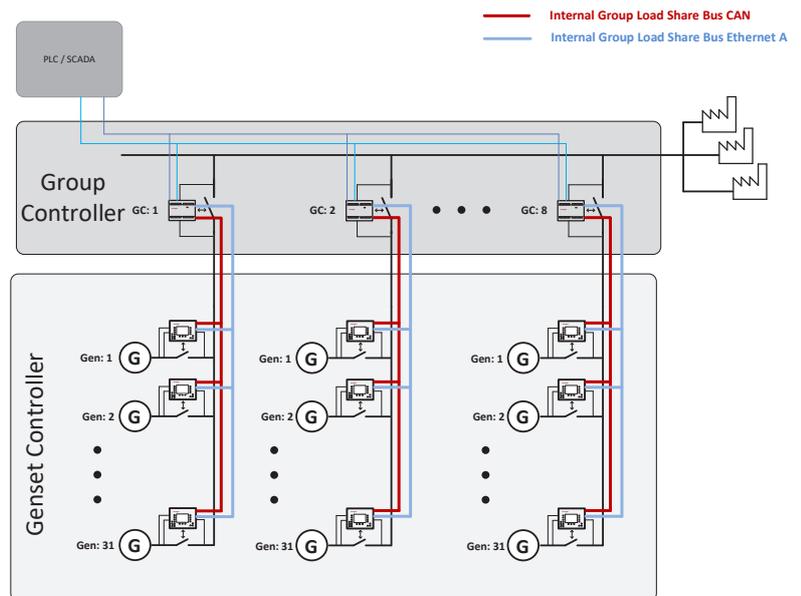
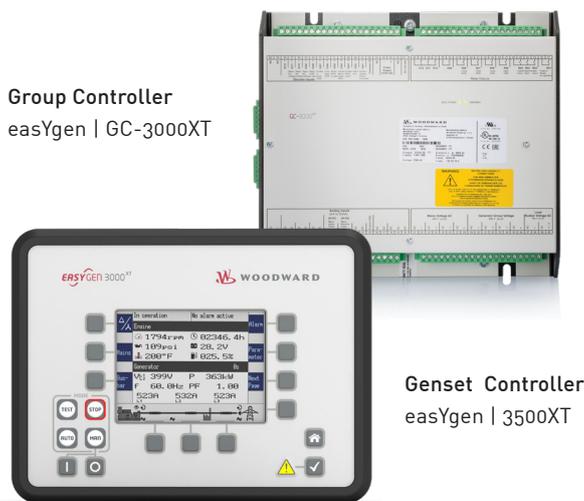
The Bennettsville community microgrid provides resilience for severe weather events and is enabled by coincident transmission demand avoidance, creating a win-win for the community and utilities. With PowerSecure providing maintenance and operation, the

community can enjoy the microgrid benefits worry-free. PowerSecure was able to provide a standard solution which translates into efficiency for their manufacturing, engineering, and support teams. The powerful solution ensures the viability of community microgrids as a countermeasure to grid vulnerability during weather events or other natural disasters and demonstrates how the microgrid can monetize grid services to pay for the resilience.

Woodward continues to support PowerSecure and all its packagers and panel builders with innovative features and cost-effective solutions to deal with an increasingly complex electrical grid.

“WOODWARD’S EASYGEN CONTROLS AND GROUP CONTROLLER HELP US STANDARDIZE OUR OFFERING TO THE MARKET FOR COMMUNITY MICROGRIDS, INCLUDING THE 22.5MW BENNETTSVILLE SITE. WOODWARD’S SOLUTIONS HELPS US MEET MARKET NEEDS WHILE STREAMLINING PRODUCTION FLOWS THROUGH OUR MANUFACTURING FACILITY.”

CHRIS ELLIS | COO
POWERSECURE



→ Woodward’s easYgen Group Controller and easYgen XT controls helped PowerSecure meet their customer’s needs while standardizing and simplifying their system design.

See **Product Spec 37896** for additional Group Controller product details.

WOODWARD CONTROLS ARE INTEGRAL TO C&I AND UTILITY-SCALE MICROGRIDS THROUGHOUT THE WORLD

We're ready to be part of every microgrid system, working with all parts of the renewable and conventional microgrid ecosystem to provide solutions for the industry.

Our technologies and services enhance energy conversion of renewable and fossil fuels, energy extraction and distribution, and electric power generation and distribution. Major power generation OEMs throughout the world use Woodward engine management systems, generator controls, and protective relays for generation and distribution as well as power converters for CO₂-free renewable energy generation.

Woodward engine management systems for diesel, natural gas, and alternative-fueled engines help customers meet strict EPA emissions regulations while providing reduced overall cost of system ownership. These technologies have

helped us maintain preferred supplier status in the diesel- and gaseous- fueled power generation industry, plant control systems operation, and the wind power generation industry.

Backed by decades of experience with generator controls, load sharing, synchronization, and power protection technologies, Woodward's power generation control solutions set standards worldwide.

We're ready to be part of every microgrid system, working with all parts of the renewable and conventional microgrid ecosystem to provide solutions for the industry.

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