



Integrated Controls for Grid-Scale Battery Energy Storage

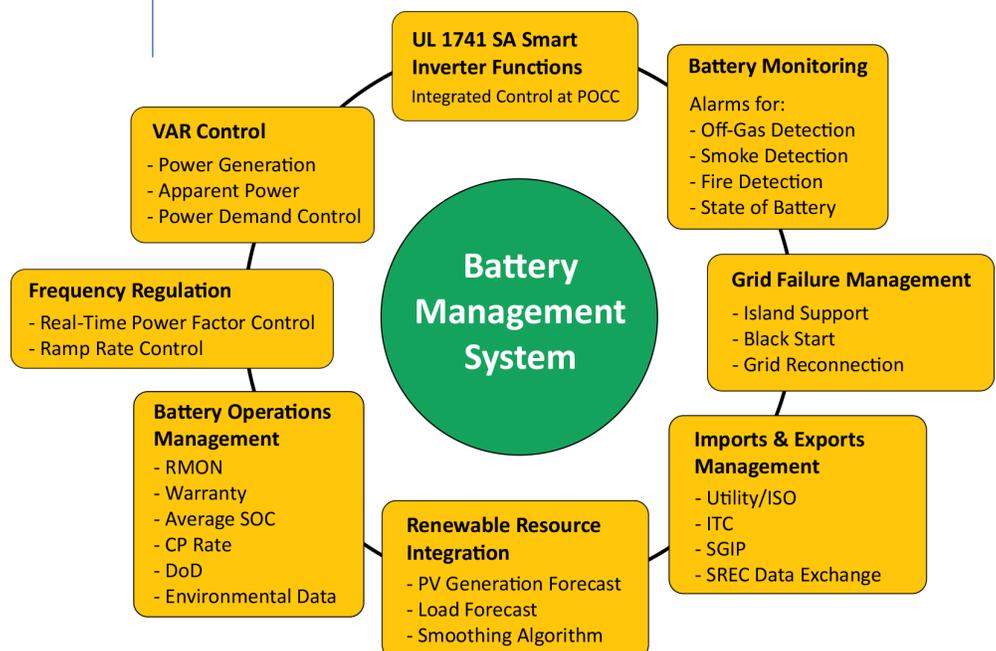
Benefits of Battery Energy Storage

- Helps balance electricity supply and demand.
- Flattens daily load or net load shapes by charging the energy storage system during lower price periods and selling power during higher-price periods.
- Reduces electricity demand charges by using stored energy during peak demands.
- Stores excess solar-generated electricity and supplies it back to the grid or local loads when needed, which reduces renewable curtailments, negative wholesale power prices, and price spikes related to evening peak ramping needs.
- Enables utilities to manage growing demand while deferring large grid investments.
- Provides back-up power during outages or to support electric reliability.

As solar power production levels have exceeded most people’s expectations, the grid infrastructure is thus strained to deliver this power. In response to this, investment in Battery Energy Storage Systems (BESS) has skyrocketed.

While the native battery management system provided with a BESS does a fantastic job of managing the battery, it requires help to work with external devices and entities. There are a wide range of interactions that must be managed by a site SCADA system in order to realize the expected benefits, as depicted below.

Trimark created Trimark SCADA specifically to enable these data and control exchanges. Using Trimark Vantage User Interface, resource owners can manage energy flow based on schedules, market values, tariffs, PV, or carbon-based generation and utility directives.



Trimark’s SCADA manages battery energy storage systems for facilities’ operations.

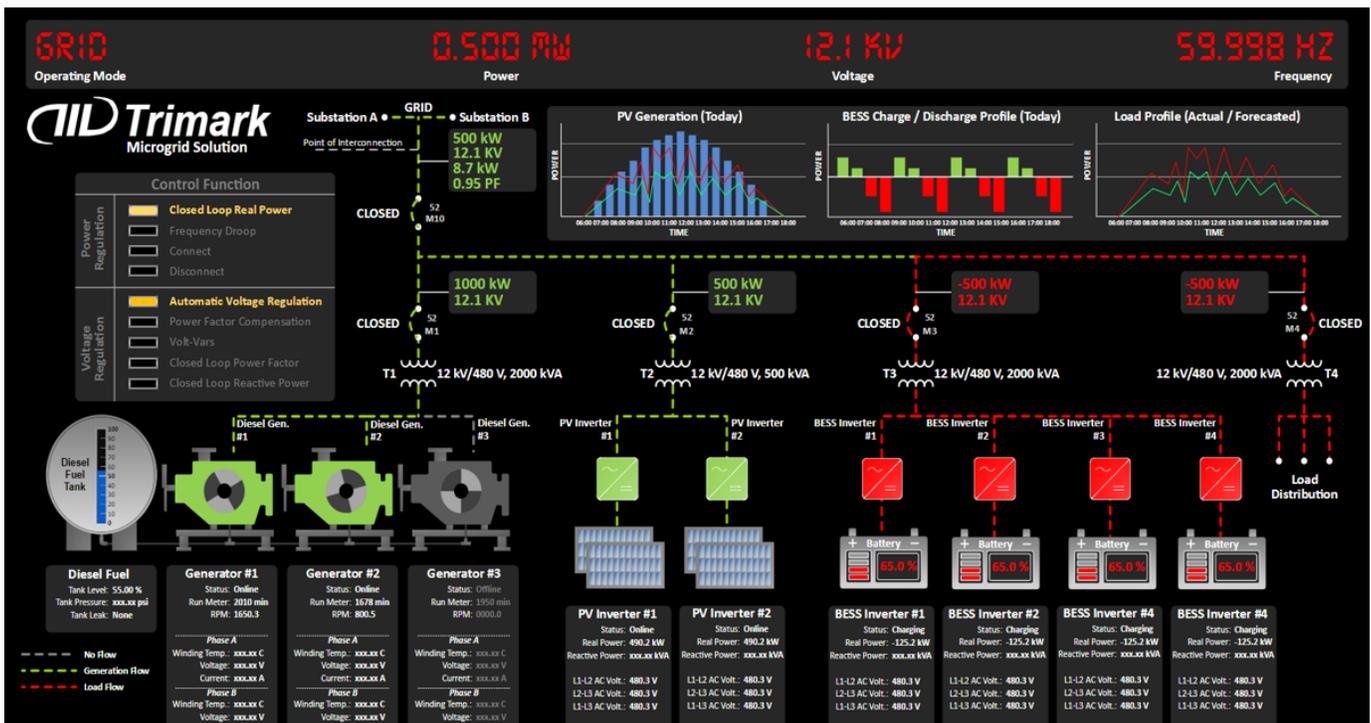
Trimark's SCADA

- Presents reliable information and automates actions to manage storage resources at the point of common coupling.
- Monitors real-time status and historical performance individually or in a portfolio.
- Performs condition-based charge/discharge closed loop control logic (e.g. when generation exceeds schedule, during curtailment, etc.).
- Automates power factor and frequency regulation, resource adequacy, energy arbitrage, spin, ramp, black start, and intermittent resource integration with awareness of broader distribution circuit needs.
- Enables secure, grid-aware aggregation and optimization of energy storage and other distributed energy resources.

Trimark Vantage

Trimark's Vantage software is used to monitor and control the performance of connected devices. Trimark Vantage is cloud-based, and provides monitoring and reporting through a simple-to-use browser interface.

Trimark Vantage can be configured for each specific user's requirements, organizing the user's highest priority information right where they want to see it.



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