



Trimark SCADA

Business Value

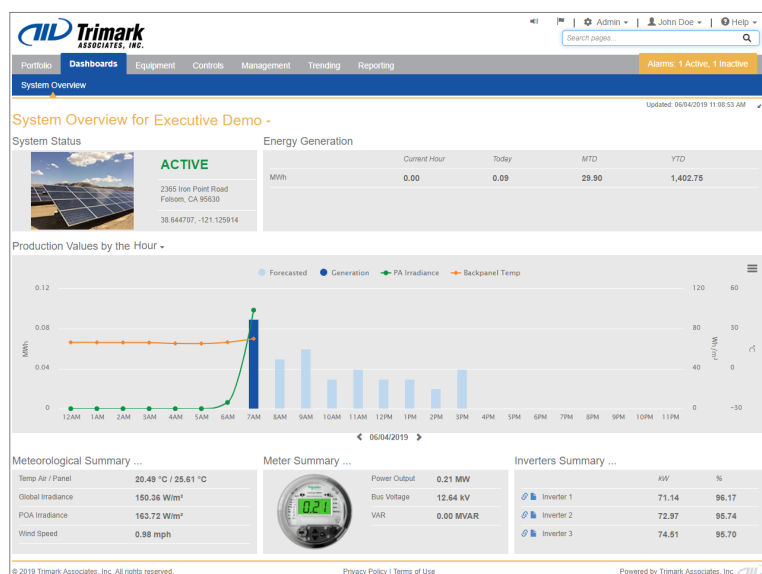
- Meet compliance requirements by maintaining contracted power levels at the point of interconnection (POI)
- Optimize plant revenue by maximizing power generation
- Report performance issues and alarms for a site or an entire portfolio
- Integrate PV power generation and energy storage management
- Proactively manage asset life cycle with condition-based maintenance
- Save time and reduce risk with a SCADA partner that delivers turnkey solutions

Managing utility-scale power resources requires real-time monitoring and precise control with a SCADA system designed to maximize photovoltaic (PV) power generation and energy storage revenue.

Trimark SCADA integrates the advanced control functions and monitoring capabilities that resource owners need to optimize operations, automate report generation, meet PPA performance requirements, maximize profits, and support asset management.

The Trimark SCADA platform includes:

- **Trimark Power Plant Controller** gathers and relays data and automates controls to deliver precise power characteristics (megawatts, voltage, VARs and power factor) at the POI.
- **Trimark Historian** collects and stores operational data for use in reports, controls, and real-time displays.
- **Trimark Vantage** is an intuitive user interface that displays real-time statuses, generates reports, lets operators issue commands, and notifies users about alarms via local, remote, and mobile access.



Trimark Vantage displays key performance indicators in a dashboard that can be configured to meet your unique requirements. There, operators can access site controls, produce reports and respond to alerts.

Enabling the Business of Power

Trimark's SCADA provides the tools operators need to manage both generation and storage resources, maximize revenue, and satisfy utility requirements.

Manage Power Production

Portfolio-Wide Management

Monitor and control performance for individual devices, a site, or an entire portfolio – all in a single, intuitive dashboard.

From there you can drill down to view real-time status of inverters, batteries, cap banks, meters, trackers, cameras, and breakers, relays, security systems, and MET instruments.

To support analysis, the system will capture, log and store data and events (e.g. controls, start/stop, breaker trips, alerts, etc.) in a SQL-based historian that meets industry standards for security, performance, capacity, and resiliency.

Customizable Alarms

Define alarms based on thresholds, conditions, or events. Critical alarms can even include escalation. You can subscribe to receive alarm notifications via email, SMS text messaging, and voice calls. The system also tracks alarm acknowledgment.

Forecast

Predict performance based on weather and industry-standard forecast models. Customizable pricing schedules enables real-time production value reports and settlement reconcilements.

The Portfolio Device Summary displays the real-time status of inverters, or other devices, across every site in the portfolio on one screen. From this consolidated view, operators can see which device has an active alarm, then drill down for details. The screen can also be filtered to show only critical issues.

Total Site Control

Trimark SCADA lets you initiate commands, automatically execute logic, and schedule controls in response to energy mandates.

Integrated PV and Storage Controls

Apply advanced controls to coordinate operation of inverters, batteries, capacitor banks, trackers, cameras, and breakers.

Closed-Loop Power Management

Guarantee power characteristics (e.g. voltage, volt-VAR, frequency droop) at the POI to meet precise utility targets. The system will govern changes using defined ramp rates.

Local and Remote

Operate the plant through a local interface, from a remote operations center, or by accepting authorized third-party commands from the utility or ISO.

Distributed Energy Resource Management (DERM)

Coordinate behavior of multiple resources acting as a single power producer.

Built-In Automation

Trimark SCADA's automation helps you meet power generation and storage objectives, bring consistency to processes, and eliminate manual tasks.

Closed Loop Control

Measure power at the POI, then coordinate multiple devices to adjust generation and storage to maintain target power characteristics.

Automated Generation Control (AGC) and Automated Dispatch System (ADS)

Integrate with utility grid management systems to regulate power production based on secure, third-party directives.



Control Your Plant Automatically and Precisely

With Trimark SCADA, you can initiate plant controls and then combine those controls with power management strategies to customize your SCADA system.

Plant Controls

- Inverter Connect / Disconnect
- Max Power Generation (WMax)
- Site Real Power
- Site Reactive Power
- Site Power Factor
- Automatic Voltage Regulation and Cap Bank Integration
- Voltage-VAR Compensation
- Frequency Droop Correction
- Power Factor Compensation
- Tracker Control
- Substation Relays, Breakers, and Reclosers

Power Management Strategies

- Grid Voltage Support
- Active Power Optimization
- Automatic Generation Control (AGC) and Automated Dispatch System (ADS) response
- Utility Demand Response
- Power Quality Management
- Energy Storage Management
- Remote Device Control



Secure Data Telemetry

Trimark SCADA supports NERC CIP compliance to help you meet critical infrastructure program requirements. Whether to authorize commands from a third party, fulfill NERC reporting requirements, or maintain confidentiality of business data, Trimark SCADA enables secure data telemetry.

Security tools let you align your SCADA system with company security standards for password complexity, reset, login attempts, and more.

Asset Management

Trimark SCADA supports your warranty, inventory, and other asset management tactics. Operations and Maintenance providers can access a complete operational history, as well as apply tools for forecasting, service ticket management, asset tracking and billing reports.

Custom Configuration

Need something special? Trimark can easily configure the interface and controls to meet your unique requirements. Trimark tailors the interface to present real time performance of your KPIs, statuses, and reports. The system will reflect specific information needed by operators and owners or by a public kiosk. You can even show your company logo and brand.

Software as a Service

Trimark offers Vantage system access via Software as a Service (SaaS). This supports best practices for security and business continuity including secure login, upgrades and enhancements, and data archival and replication for business continuity.

Save Time and Reduce Risk with a Single Source SCADA Partner

Trimark's turnkey solution provides project support from start up through commissioning, operation, and maintenance. Beyond control and monitoring, Trimark provides all associated computer servers, firewalls, fiber switches, server cabinets, and MET instrumentation.

We back those devices with engineering, integration, on site installation, testing and commissioning – exactly what you need for a fully-operational system. After commissioning, Trimark provides ongoing support to ensure your systems perform at their absolute best.

By working with a proven vendor like Trimark, you minimize the risks and complications of managing multiple providers across a variety of technical disciplines.

Trimark SCADA Feature Summary

Monitoring

- Portfolio View
- Dashboard Key Indicators
- Browser and Mobile Access
- Interactive Site Diagram
- Equipment Status
- MET Data
- Meter Values
- Reporting
- Alarms & Alerts
- Substation

Operator-Initiated Controls*

- Inverter Connect/Disconnect
- Max Power Generation
- Site Real Power
- Site Power Factor
- Site Reactive Power
- Tracker Positioning

Automated Controls*

- Cap Bank Control
- Charge/Discharge
- Automatic Voltage Regulation
- Volt-VAR compensation
- Frequency Droop Correction
- Automatic Generation Control
- Utility Demand Response
- Power Quality Management

Standard Reports

Trimark SCADA enables easy access to historical reporting, graphing, and data. Reports can be automatically generated and distributed according to your pre-defined schedule. This means you get consistent reports while reducing manual efforts.

The following list shows common reports available in Trimark SCADA:

Performance Monitoring

- Site Inverter Max Power
- Site Meter Average Power
- Battery State
- Device Details and Availability
- Device Lost Energy
- Portfolio Production Values
- Portfolio Activity Summary
- Portfolio Inverter Availability
- Production Analysis
- Site Availability
- Site Energy and POI Irradiance
- Site Inverter Availability
- Tracker Position

Trouble Notifications

- Alarm Activity / Events (Inverters, Batteries, Trackers)
- Alarm Definitions Detail / Summary
- Trackers Solar Noon Position and Deviation

Business & Operations Management

- Activity Summary
- ADS Dispatches
- Control Request Details
- Curtailment Time and Amount
- Daily/hourly Energy
- Energy Forecast
- Production Values
- Site Energy and POI Irradiance
- Meteorological Data
- Site MET Average Data
- Energy and POA Irradiance

Meteorological Summary Report

- Soiling Module Graphs
- Meteorological Summary Solar Day Plot and Time Series
- Meter Energy vs. Irradiance

System Administration & Security

- Anomalous Activity
- Password Reset Activity
- User Activity Report
- Users Failed Log in Activity

*Complies with CPUC Rule 21 Smart Inverter Initiative



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