Integrated SCADA Solutions to Optimize Utility PV Plant Performance
Proven SCADA Technology.
Proven SCADA Solutions.

Providing:

- Real-time data acquisition and supervisory control
- HMI visualization
- Local and remote alarm management
- User-configurable security model
- Historical data collection and analysis
- Remote user access via web or smartphone
- Comprehensive system diagnostics to simplify troubleshooting
- Open communications interface using industry standard protocol

For over 25 years, Wonderware has provided innovative market leading SCADA solutions for the oil and gas, water/wastewater and electric power generation industries. Today, Eaton can provide a comprehensive off-the-shelf monitoring and SCADA application built on the field-proven Wonderware System Platform that is specifically designed for utility-scale photovoltaic solar facilities.

This Solar Industry Application is tightly integrated with all of the key components and subsystems typical of any grid-tied solar PV generating plant. It monitors real-time data from inverters, transformers, switchgears, power meters, combiner boxes and weather stations in order to provide key performance indicators that improve operational efficiency and plant reliability.
SCADA functions for solar PV systems

**Features and benefits of the solar industry application**

- Preconfigured solar application database and graphics reduce application engineering deployment and testing effort
- Intuitive “drill-through” interface requires minimal training to begin using the system
- Key performance indicators (KPIs) help improve Operations and Maintenance (O&M) efficiency, which reduce the cost of plant ownership
- Predictive system analysis monitors and compares DC currents from inverters and/or combiner boxes as well as predicted versus actual power production to warn of potential array issues and maintenance needs
- System accepts industry leading and standard communications interface (Modbus TCP, DNP3, etc.)
- High-resolution historical data storage facilitates diagnostic analysis and troubleshooting
- Powerful client tools for trending, data analysis and reporting
- Remote web access to the system via the intranet or VPN connection from any PC, Smartphone or tablet device
- Remote alarm notification and acknowledgement via cell or Smartphone using email or text messaging
- Built-in redundancy ensures maximum system availability
- Comprehensive security model allows personalized access based on user login
- Modular and scalable to support easy expansion with minimal engineering effort
- Supervisory control to support automatic power factor, voltage regulation and tracker control
- Standard daily/weekly reports for weather and power generation allows early detection and diagnosis of any potential issues
Standard Graphic Displays

**Plant Overview Graphic Display**
Provides a high-level overview of the system with key plant performance indicators including daily power generation, instantaneous generation, irradiance and planar irradiance. Key inverter information is also displayed in order to aid in maintenance and troubleshooting activities. Operations can easily compare inverter performance and can easily identify inverter faults at a glance.

**Inverter Detail Display**
Selecting one of the inverters from the plant overview display calls up a more detailed view of the inverter data, allowing users to monitor performance and output, including feed and output voltage and currents. Faults specific to the inverter are displayed in the alarm banner at the bottom of the inverter detail display.

**Combiner Box Detail Display**
When string level monitoring is implemented, the combiner detail allows for string level instantaneous and historical output performance analysis. A graphical comparative analysis and individual string alarms make it easy to identify low string performance or degradation issues. A pull-down menu makes it easy for the user to navigate to other inverters and combiner boxes.

**Trending and Analysis Display**
Real-time and historical data can be analyzed for any system component from the trend display. The user can trend as many points as desired and use a hairline cursor with pan and zoom functions to further analyze the data over any user-defined time period.

**Alarm Historical Summary Display**
This alarm display summarizes all historical alarms and allows the user to acknowledge alarms as they occur in real-time. The user can quickly view the alarms over the last hour, day, week or month. Alarms can be acknowledged from this screen or from a remote smartphone so that faults can be identified if the plant is unattended by an operator.

**Power Meter Monitoring Display**
Provides a view of key power metrics, including energy generated, apparent power, power factor, historical power generation (year-to-date, month-to-date, yesterday). Additionally, all power attributes can be trended for long-term analysis.
While Eaton offers products and solutions to meet your most critical electrical power management challenges, we also have one of the largest and most experienced team of power system engineers in the industry. **Eaton’s Electrical Engineering Services and Systems** focuses on understanding your business requirements and optimizing your power system. We not only offer start-up, acceptance testing and commissioning services, but our engineers and consultants can help diagnose problems, identify ways to improve performance or transform concepts into flexible, practical solutions that can improve productivity and use of capital. We can help keep your solar power system safe, efficient, reliable and up-to-date. Eaton provides turnkey **SCADA solutions** using wireless communications to monitor KPIs for optimizing solar power performance.