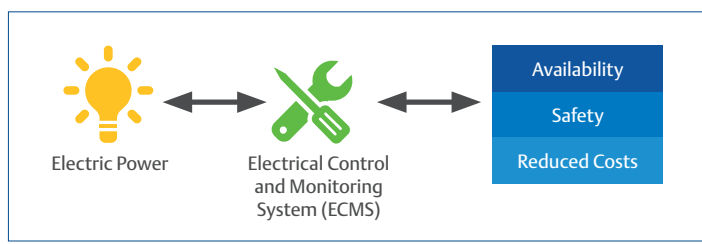




Electrical Control and Monitoring System Solutions

PACSystems™ Electrical Control and Monitoring System Solutions

Uninterrupted and high quality power is critically important for operations continuity, and plant safety and is a major performance driver across a plant's operations. Whether plants are small, medium, or large, and whether they operate in discrete, process, or hybrid, they all have performance, safety, and sustainability goals that rely on energy management. Emerson's PACSystems Electrical Control and Monitoring System (ECMS) solutions provide a cost-effective, open digital toolset to better maintain a plant's unique array of electrical power sources and help meet ISO 14001 guidelines.



PACSystems ECMS solutions aggregate and centralize data to help operators control and visualize the reliability and productivity of the plant's electrical system with features including:

- Electrical SCADA
- Black start function
- Real-time alarms and alerts
- Grid synchronization control
- Circuit breaker control
- Motor control
- Transformer and tap changer control
- Connection to any meter, or field measuring system
- Energy consumption metrics
- Power quality metrics
- Load shedding / load balancing metrics
- Availability metrics
- Power synchronization metrics
- Detailed consumption and cost reporting

PACSystems' Scalable and Customizable Solutions Fit a Wide Variety of Use Cases

Energy Monitoring – Nearly every plant must calculate how much power comes in, how much is consumed, and build baselines from this data to develop projects for improving energy use. PACSystems' ECMS solutions leverage the intuitive energy management tools of Movicon™ software's Pro.Energy™ HMI SCADA package to track and trend energy data, generate intuitive reports, and offer project recommendations to improve energy use.

Granular Power Control – As plants add pieces of equipment that run continually and consume more power—crushers, mills, compressors, and more—operators move beyond energy monitoring into more granular electrical control. PACSystems ECMS solutions enable operations to move beyond monitoring electricity from a single point, instead breaking down energy management by zone or even individual pieces of equipment.

Full-Scale Electrical Control and Management – When a facility's electrical system becomes complicated, electrical problems can have far more significant impact on the plant. When an anomaly with electrical infrastructure leads to plant operations disruption, the costs can be extreme—operators and maintenance teams need instant access to all possible data to track, trend, predict, and react to maintain reliability of the electrical system. PACSystems ECMS solutions harness the power of Movicon software to collect and contextualize data from the many measurement points across the facility in a central location, integrated with and easily accessible from the plant's control system.



More Stable Operation

- Optimize in-plant generation and the power taken from the grid with the most economical values using active and reactive power control features.
- Generate demand patterns to optimize the operation of various plant loads during different times to stay within contract values.
- Use peak shaving and load balancing between generators and consumers to drive optimum efficiency.

Instantaneous Awareness

- Provide operators real-time information and full visibility of the electrical system.
- Identify equipment status, electrical data, and electrical system and equipment faults.
- Improve visibility with trending, alarms, data analysis, and extensive reporting capabilities—while simultaneously maintaining compliance with clear audit trails.

Improved Safety

Today, electrical safety in the plant encompasses more than just physical safety around electrical substations, switchgear, and circuit panels. Cybersecurity incidents can wreak havoc on operations and, in the worst cases, even put personnel at risk.

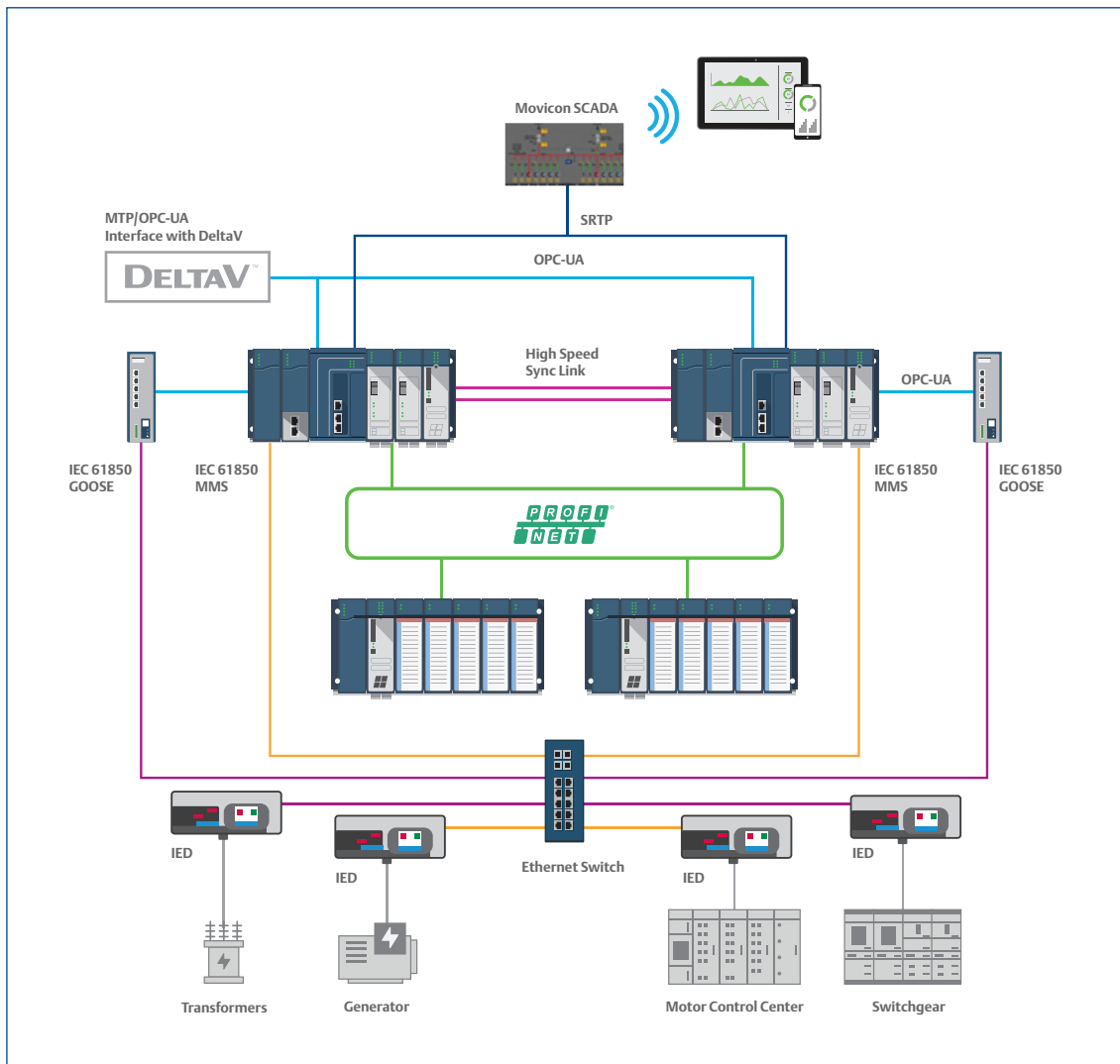
- Improve safety with enhanced cybersecurity—PACSystems ECMS is Achilles Level 2 certified and the HMI is fully compliant with IEC 62443-3-3 standards for system security requirements and security levels.
- Increase and encourage safe operation with remote control of electrical equipment.



Ready for Existing Infrastructure

PACSystems ECMS solutions easily integrate with DeltaV distributed control and safety systems and existing third-party control and monitoring architecture using the wide variety of protocols built into PACSystems PLCs and Movicon SCADA software, including:

- Module Type Package (MTP)
- Modbus Serial
- Modbus TCP/IP
- Ethernet IP
- IEC 104
- OPC UA
- BACNet for building management devices
- IEC 61850
- DNP3
- PROFINET®



Powerful Equipment Protection

When a utility line fails, or machines have precise electrical needs that must be met, operations and maintenance teams need easy, automatic solutions to safely and efficiently adjust power thresholds to protect equipment and runtime.

Load Sharing – Ensure generation sources share the load in the desired proportion. Also ensure maximum demand from utility is kept within limits.

Fast Load Shedding – Shed excess loads in a pre-arranged priority, with the less critical loads shutting down first, at loss of power supply sources.

Slow Load Shedding – Shed excess loads in a pre-arranged priority, with the less critical loads shutting down first, due to overloads (peak shaving).

More Energy Efficient Operations

Achieving peak performance requires careful monitoring and maintenance of energy efficiency throughout a facility. As more plants strive to meet sustainability goals and compete in the global marketplace, PACSystems ECMS solutions can provide clear visibility and control of energy performance. Operators will have access to the deep intuitive data necessary not only to make the best decisions to maintain optimum energy efficiency but will also have access to a wide range of tools for better control, safer operation, and easier compliance.

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