PMCS
Energy Management Systems
PMCS

PMCS is an Energy Management System that will reduce the cost of energy to a customer by optimizing the methods used to control both processes and equipment to utilize energy more economically and efficiently.

PMCS is a customized solution that can range from a simple Remote Monitoring System to a completely engineered Automated Control System.

Integrate GE Multilin & 3rd Party Devices
PMCS Modular Systems

PMCS Energy Management System is achieved by implementing one or more of the following four application modules:

- **Monitoring**
  - Remote Metering
  - Alarms
  - Data Logging

- **Power Quality**
  - Harmonics
  - System Event Logging
  - Waveform Capture

- **Cost Allocation**
  - Energy Tracking
  - Usage Aggregation
  - Power Bill Generator

- **Control & Automation**
  - Start-up Management
  - Auto-Transfer Schemes
  - Load Shedding Schemes
PMCS Project Deliverables

A complete PMCS system includes all of the following deliverables to ensure the Energy Management System meets the specific needs of the customer.

**Energy Management Evaluation**
- Consultation on the energy management system requirements of the facility.

**Project Management**
- Drive project delivery schedule
- Ensure all system requirements are met
- Implement software configuration and customization

**System Hardware**
- Computer, monitor, meters, relays, ethernet switches, and communication converters

**Software**
- EnerVista Integrator (OPC/DDE server)
- HMI software package
- System event analyzer
- System waveform analyzer
PMCS Monitoring Module
Monitoring

The Monitoring Module displays voltage, current, power, energy, and demand data from remote intelligent electrical devices throughout a facility.

Log and trend data from meters, relays, and breaker trip units in order to analyze the power system.

Highlight and acknowledge unusual activity and alarm conditions with the real-time and historical alarm viewers to ensure that problems do not go unnoticed.

Who Needs PMCS Monitoring

- All Industrial and Manufacturing Plants
- Commercial Buildings
- Mass Transit Systems
- Hospitals & Extended Care Facilities

The PMCS Customer Interface

- One-Line diagram
- Alarm screen
- IED monitoring
- Site diagram
Monitoring Example:

Health Care

Hospitals are very conscientious about controlling energy costs and avoiding electrical outages that effect life saving equipment.

Reacting quickly to electrical problems is essential. Using the existing LAN, a centralized interface is needed to monitor all feeders.

PMCS Solution

- Multilin meters to manage real-time energy consumption
- Communication to all feeder breakers to monitor and control from one location
- Instant alarm and event information, decreasing response time to problems
Monitoring Example:

Hospital Solution

The PMCS Customer Interface

- Birds-eye site diagram for system overview
- Animated One-Line Diagram for system status
- Alarm screen for instant event information
- Consolidated tabular data screens
- Switchgear and device screens to monitor system hardware

PMCS Monitoring turns a desktop computer into a virtual window for tracking and analyzing a medical centers power

Plus 3rd Party Devices
PMCS
Power Quality Module

MONITORING
Remote Metering
Alarms
Data Logging

POWER QUALITY
Harmonics
System Event Logging
Waveform Capture

imagination at work
Power Quality

The **Power Quality** module remotely captures disturbances on the electrical network such as total harmonic distortion, individual harmonic distortion, and sub-cycle transients.

Event logs of triggered high speed electrical disturbances are displayed in a prioritized list that is automatically written to a database file.

Event triggered waveform recordings and out-of-limit logs provide an accurate system-wide depiction of power disturbances and allow for forensic analysis.

### Who Needs PMCS Power Quality
- Oil & Gas Processing
- Municipal Water
- Pulp & Paper
- Mining
- Data Centers

### The PMCS Customer Interface
- Event Recorder
- Event Analyzer
- Waveform recorder
- Harmonic monitoring (THD and individual)
Power Quality Example:

Oil & Gas Example

Oil refinery sites use an ever increasing number of harmonic generating non-linear loads. The resulting harmonic distortion causes motor overheating, breaker tripping, fuse blowing, and capacitor failure. Harmonic resonance multiplies this problem.

A system is required to identify the magnitude and location of these downtime causing disturbances.

PMCS Solution

- Multilin power quality meters to monitor system apparatus for high harmonic content, high speed transients and flicker
- Centralized database that accumulates the PQ data
- Diagnostic software tools for fault analysis
Power Quality Example:

Oil & Gas Solution

The PMCS Customer Interface

- Real-time harmonic data from PQ measuring devices to provide instant network status
- Event Recorder to show frequency and magnitude of equipment-damaging system instabilities
- Waveform recorder to isolate & understand the exact nature of a problem

PMCS Power Quality brings visibility to previously hidden network events, allowing preventative action before costly process shutdown.

Plus 3rd Party Devices
PMCS
Cost Allocation Module
Cost Allocation

The **Cost Allocation Module** is an energy management tool that aggregates energy data to create usage reports.

Generate individual bills for user defined cost centers that show total energy and peak demand power use, based on Time of Use (TOU) schedules, seasonal schedules, and utility rate structures.

Rate structure simulators highlight the revenue impact of power supplier changes and load shifting.

Virtual metering capabilities allow measurement where no single meter exists.

**Who Needs PMCS Cost Allocation**

- All Industrial & Manufacturing Plants
- Commercial Real Estate
- Residential Real Estate (submetering)
- Healthcare Facilities
- Educational Institutions

**The PMCS Customer Interface**

- Utility configurator
- Utility simulator
- Load analysis/energy use profiling
- Device/departmental energy bill generator
Facilities rely on the monthly utility power bill as the sole source of power and energy usage. More detailed information is required on how much energy is being used, and where the largest users are. Complex rate structures are difficult to understand, making energy reduction strategies difficult to initiate and quantify. Individual departments must be held accountable for their energy costs.

**PMCS Solution**

- Define energy usage specific to cost centers using real and ‘virtual’ meters
- Energy profiling and load analysis reports
- Easy-to-use tools to devise and evaluate what-if scenarios to create effective strategies for cost reduction
Cost Allocation Example:

Auto Parts Manufacturing

The PMCS Customer Interface

- Individual power bills, with energy and peak usage, created for each cost centers to assign cost accountability
- Utility configurator to define & understand existing energy costs
- Utility simulator to device energy reducing and cost saving strategies
- Viewer screens with profiles of energy & peak demands based on utility rates

PMCS Cost Allocation facilitates effective energy reduction strategies that save customers significant $$
PMCS
Control & Automation Module
Control & Automation

Control & Automation module executes energy management strategies by automating load-shedding schemes to minimize energy charges.

Automate equipment staging in order to control process startup.

Control the opening, closing, and tripping of breakers remotely

Employ automatic transfer schemes to ensure continuous power for mission critical processes by automatically switching to stable power feeds and shedding load when appropriate.

Who Needs Control & Automation

- All Industrial & Manufacturing Plants
- All uptime essential facilities
- Municipal
- Utility
- Hotels & Casinos
- Data Centers

The PMCS Customer Interface

- Transfer scheme setup
- Automated transfer scheme controller
- Individual breaker control
- Automated load manager
Control & Automation Example: Water Treatment Plant (WTP)

WTPs create high inrush current on their motors & pumps during system process startup, resulting in system voltage sags, higher peak demand charges, and equipment wear.

Continuous operation of the plant is essential, requiring a system to seamlessly manage the multiple utility power feeds & large backup power generators.

Remote locations exist where fast response is needed to react to breaker trips.

PMCS Solution

- Centralized control room interface for the entire electrical system.
- Load manager to enable automatic equipment start-up, staging and shut-down.
- Trip units on breakers for remote control.
- Auto-transfer scheme manager.
Control & Automation Example: Water Treatment Plant Solution

The PMCS Customer Interface

- Transfer scheme exerciser screens to create and implement power feed transfer plans, ensuring maximum process uptime
- Breaker control panels to manually open, close and lock-out breakers remotely, increasing response time
- Load management screens to plan efficient equipment startup, increasing equipment life and reducing peak demand

PMCS Control & Automation executes energy management

Plus 3rd Party Devices
PMCS
Complete 4 Module Solutions
PMCS Total Solutions:
Applications will typically incorporate more than one Module
The WTP example had the devices to use all four PMCS Modules
PMCS

Energy Management Systems

Modular solutions for today’s energy-conscious facility