

EnergyPQA.com

AI DRIVEN ENERGY MANAGEMENT SYSTEM

Empower Energy Management Decisions With a Simplified Userfriendly Interface

The EnergyPQA.com[®] AI driven energy management system transforms traditional energy management by identifying the most energy wasteful facilities and circuits and those with the highest power quality risk. Maximize energy efficiency improvements and increase electrical reliability by using the system's deep power quality insights to focus on the least efficient and least reliable circuits. Make the biggest improvement in energy usage efficiency and reliability by spending time and resources where they are most needed and where they will have the most impact.

The EnergyPQA.com® energy management system reduces your enterprise energy costs in multiple ways. The system's AI algorithms predict usage trends into the future, so that you can be proactive in reducing demand and saving on energy costs. Power quality email alerts enable quick response to avoid equipment damage and expensive downtime. Predicted peak demand email alerts up to three days in advance support demand mitigation efforts to avoid costly penalties. And focusing on facilities and circuits most in need of repair ensures that money is spent where it will have the most impact on the enterprise's bottom line.

Features:

- Enterprise level energy usage analysis and facility comparisons.
- Custom reporting with AI predictions.
- C-Suite reporting that provides actionable insights for your facilities.
- Identification of energy inefficiency from enterprise to facility to circuits.
- Automatic grading of your facilities

for risk of downtime and equipment failure.

- Detailed waveform analysis and key insights.
- Alarming for critical events, such as power quality or energy demand penalties.
- Cyber secure, encrypted data, dual factor and TOTP authentication, rolebased authorization, and security reports.
- Sustainability reporting for carbon footprint and green initiatives.
- Energy billing, cost allocation, and executive summary usage reporting.
- Power usage effectiveness (PUE) for data centers.
- Current and predicted commodity usage and costs.
- Leak Detective[™] feature that discovers and generates alarms on water and air leaks.
- Data export to third party applications using DataLink[™] API.
- Status webpages for monitoring system activity.

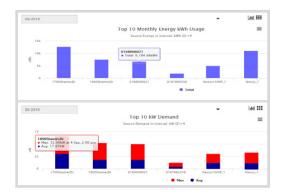


Reduce Electrical Energy Costs Using Enterprise Energy Analysis

The EnergyPQA.com[®] Al driven energy management system enables energy usage comparisons and predicts energy usage and demand for all your facilities. The system reports on highest energy usage and highest peak demand contributors to pinpoint problem areas. Improve energy efficiency and reduce power consumption by using the system to identify poorly performing buildings and implementing energy conservation. Track all commodity usage in a facility, eliminating discrete systems for water, air flow, gas, electric, and steam (W.A.G.E.S.) meters.

Energy Dashboards

The system's dashboards make it easy to view differences in energy and other commodity usage throughout a facility. View top ten monthly usage and demand, daily usage comparisons, energy usage compared to the previous month, and monthly average power factor. Compare and benchmark different metering points to determine energy waste within a facility.



Compare Top Ten Monthly Energy and Demand Users to Identify Energy Waste

Normalize Data by Degree Days for Comparisons

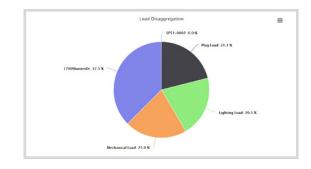
EnergyPQA.com[®] can normalize your data by degree days, occupancy, and square footage. This enables you to accurately compare your facilities based on location and usage.

Totalized Metering

Create virtual sums of energy for a particular usage, such as lighting, plug load, and HVAC. This enables clear comparisons and compliance reporting.

Load Disaggregation

Load disaggregation identifies the contributors to the total facility load. Break out discrete energy loads within a facility to locate inefficiencies and proactively predict equipment failure.



Load Disaggregation to Locate Energy Usage

Energy Accountability

Drive sustainability and energy efficiency programs by billing tenants for their actual usage rather than proportional square footage charges. This direct accountability for their energy use promotes sustained energy conservation behavior and saves up to 15% on total energy costs.



Predictive AI Analytics Help Manage Demand and Usage

Provide More Accurate Energy Predictions by Using Advanced AI Modeling Tools

The EnergyPQA.com[®] system uses an advanced AI data science model that includes present data, past data, weather patterns, and future forecasts. The system is self-learning, so that it improves the accuracy of its load predictions over time.

Alarm on Future Peak Demand to Reduce Penalties

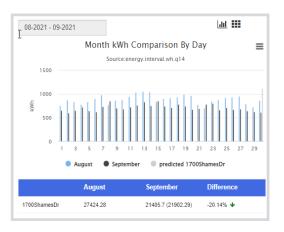
EnergyPQA.com[®] predicts when your facility will reach a new peak demand and alarms your team. This allows corrective behavior to mitigate utility penalties and save you money.

- Receive early warning of new peak demand three days in advance.
- Make meaningful decisions to reduce demand penalties before charges are incurred.
- Conduct demand response or adjust electrical usage for the energy system on the predicted day, to reduce or eliminate the penalty.

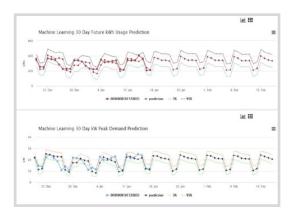
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Ensure Success for Energy Conservation Initiatives by Viewing Predicted Energy Usage

Use the EnergyPQA.com[®] system's predictions to assess energy savings opportunities. Then determine the effectiveness of load curtailment initiatives by viewing the changing future predicted usage, ensuring that implemented plans are successful.







Water, Air Flow, Gas, Electric, Steam (W.A.G.E.S.)

Manage All Facility Commodity Usage

- Analyze water, air flow, gas, electric, and steam (W.A.G.E.S.) usage from pulse or analog inputs of EIG meters.
- Predict commodity usage and costs through the end of the month.
- Disaggregate total commodity costs.
- Leak Detective[™] identifies commodity waste and areas in need of repair:
 - For water, higher than expected flow rate.
 - For air, lower than usual air flow (for analog inputs only).



W.A.G.E.S. Current and Predicted Usage and Costs, with Leak Detective ™ Feature

Customizable Report Generator

Use the EnergyPQA.com[®] system to generate custom reports as needed. Schedule emailed reports for daily, weekly, monthly, or custom distribution.

Standard report templates enable easy and quick setup. Report templates include:

- Total watts.
- Energy in the interval.
- Demand in the interval.
- Voltage and frequency.
- Watts, VAR, VA.
- THD.
- Degree days.
- Load disaggregation.
- All reports can be edited with new readings.

Custom report templates include:

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- Titles.
- Simple formulas.
- Complex formulas.
- Summation and averaging.
- Date and time of max reading.
- Bar, line, and pivot charts.
- Real time report preview.
- Standard spreadsheet editing format.



Create Customized Reports

DataLink[™] API

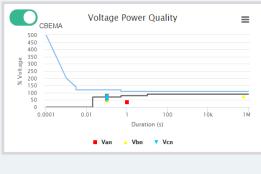
Use the EnergyPQA.com[®] system's DataLink[™] API to easily export EnergyPQA[®] data to a third party application. The data is exported in a standard JSON format for direct import into another application or system. Data collected through the API includes all log data from the system events, historical, power quality, limits, and waveform logs; and carbon footprint (CO2) data. Role-based authorization provides security for the DataLink[™] API.

Reduce Risk and Improve Uptime Using Power Quality Analysis

Downtime caused by power outages results in billions of dollars lost annually. It is estimated that 50% of mission critical power outages are due to power quality issues and that 80% of these issues originate in facilities. Identify power quality events within your critical facilities and take action before PQ events become catastrophic.

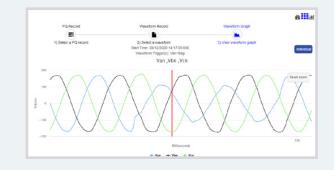
EnergyPQA.com® Unlocks Your Hidden Power Quality Problems

- Facility and circuit level power quality risk grading.
- CBEMA and SEMI F47 reporting.
- Fault location identification.



CBEMA Reporting

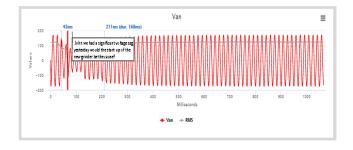
- Waveform viewer surge and sags.
- Harmonic magnitudes and THD.
- Phase imbalance and PF analysis.



Waveform Viewer

Record and Share Waveform Insights

EnergyPQA.com[®] allows you to add comments and range markers to waveforms of PQ events. The annotated waveforms are saved in the database, so they can be shared with others on your team and be used for historical PQ analysis.



Single Cycle Waveform with RMS Data, Range Marker, and Annotation

Recover From Faults with PQ Direction and Power Harmonic Direction

When an event occurs, being able to pinpoint the exact location of the fault ensures speedy recovery and timely mitigation of losses. Using its PQ Direction algorithms, EnergyPQA.com[®] will identify the location of the fault, either upstream or downstream from the device, so your team can take immediate action. Power Harmonic direction is also available.



EnergyPQA.com® Pinpoints Locations of Fault and Power Harmonic Direction

Alarm on Events Supports Timely Action and Issue Resolution

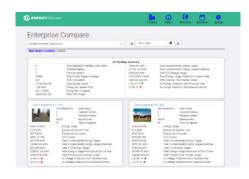
Receive email alarms on enterprise wide power quality events and out of limit conditions. These alarms include:

- Out of limit conditions, including W.A.G.E.S. leak detection.
- A new power quality event.
- A new meter-captured waveform graph of a high-speed power quality condition.

Enterprise Level Reporting Provides Analysis for Your Complete Business

Analyze Energy Usage - Grade Facilities and Identify Potential Savings

Perform analysis of your enterprise energy usage with the EnergyPQA.com[®] system's enterprise level reporting. Compare the following for each of your facilities:



- Total energy usage.
- Energy used per square foot.
- Energy used per occupant.

Compare Usage

View predicted energy usage through the end of the month and year and usage change from the prior month and year, for your enterprise and each facility. The enterprise comparison feature also provides the following graphs:

- Total usage for the past five years, for energy, energy per square foot, energy per occupant, and CO2 footprint.
- Top ten facilities for usage and predicted usage through end of the month.
- Enterprise usage comparison between current year and prior year, for each facility.

View High-level Enterprise Summary and Facility Energy Usage Comparisons

Determine Sustainability with Carbon Footprint

Analyze your carbon footprint per facility and for the total enterprise to measure your impact on the environment and meet sustainability goals. This is ideal for net zero and carbon neutral initiatives.



Reduce Costs and Mitigate Risk with C-Suite Reporting

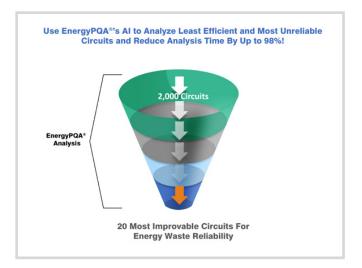
C-Suite reports provide detailed analysis of enterprise facilities and their individual circuits. Use these reports to identify the least efficient and highest power quality risk areas of your enterprise. Then take actions to improve the worst facilities and circuits.

- Improve energy efficiency by determining the least efficient circuits in the worst facilities to make the biggest improvement. Reducing energy waste results in cost savings.
- Improve electrical reliability by determining the facilities and circuits with the highest power quality risk. Increase the reliability of the least reliable circuits in the most at-risk facilities to improve enterprise power quality, improve safety, and reduce costs for maintenance and repairs.

C-Suite Reports Perform Analysis and Recommend Action

The EnergyPQA.com[®] energy management system uses enterprise wide metering data and advanced AI algorithms to produce two types of C-Suite reports – cost management and risk mitigation. These reports reduce engineering analysis time by up to 98% by identifying the specific circuits that will have the most impact on cost savings and power quality risk reduction. A typical use case is shown in the top-right diagram.

Instead of spending engineering time and resources analyzing data manually, generate C-Suite reports that provide the information needed in a matter of minutes. The EnergyPQA. com® system analyzes all your enterprise facilities and their multiple circuits to identify the worst circuits in the worst buildings. This provides a focused path to substantially improve energy efficiency and reliability for the enterprise.



Use EnergyPQA.com® to Narrow Down Most Wasteful Circuits

The Cost Management and Risk Mitigation C-Suite reports have three versions each:

- C-Suite Summary to highlight critical enterprise issues in 30 seconds.
- Enterprise Benchmark to compare facilities and uncover hidden issues.
- Single Facility Performance for a detailed view of one facility and its circuits, to identify corrective actions.

The reports can be viewed in an Internet browser, downloaded, printed, or can be scheduled for automatic emailing to multiple addresses.

Cost Management C-Suite Reports

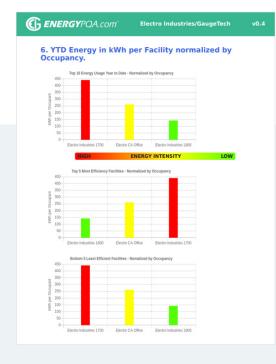
Use the Cost Management reports to analyze facility and circuits' energy efficiency and pinpoint improvements that will reduce energy costs. The single page Cost Management summary report provides:

- Enterprise facilities graded for energy efficiency.
- Potential cost savings from moving facilities with grade F to grade A.
- Total energy cost per facility for the month.
- Total enterprise energy costs year-to-date and predicted to year's end.
- Total enterprise energy costs year-to-date per square footage and per occupant.
- Total enterprise year-to-date CO2 output (carbon footprint).

The detailed Cost Management benchmark report provides explanatory material and multiple tables, including:

- Executive summary overview showing results of the enterprise energy efficiency analysis, with projected cost savings.
- Enterprise facilities graded for energy efficiency, with square footage and occupancy information.
- Enterprise facilities ranked by their energy efficiency, with an explanation of the ranking process.
- Year-to-date energy costs per facility compared to previous year.
- Top ten facilities with greatest energy usage year-to-date and normalized by:
 - Square footage.
 - Occupancy.
 - Degree day.

A page from the Cost Management benchmark report is shown below:



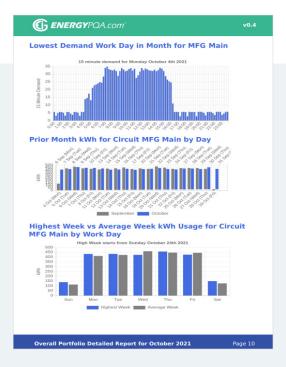
Year-to-Date Energy Use Normalized by Occupancy

The Cost Management facility report provides detailed energy usage information for all circuits in one facility. Use this report to further analyze the cause of energy inefficiency in the worst enterprise facilities. The report analyzes all facility circuits and grades them, highlighting the circuits most in need of improvement. By taking steps to increase the energy efficiency of the worst circuits, energy usage costs for the entire enterprise are reduced.

The Cost Management facility report contains:

- The facility's grading information.
- Ranking details.
- Details of the facility circuits' energy usage and costs.
- The top ten year-to-date circuits for energy usage versus the previous year.
- Facility circuits' energy usage by degree days.
- Increase/decrease in energy usage for facility circuits yearto-date.
- Detailed usage, cost, and demand information for each facility circuit.

A page from the Cost Management facility report is shown below.

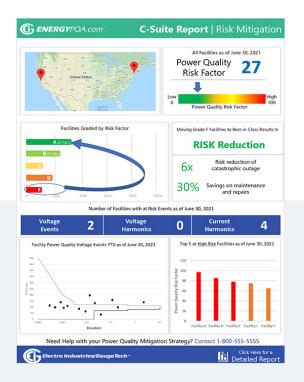


Risk Mitigation C-Suite Reports

Use the Risk Mitigation reports to analyze facility and circuits' power reliability to pinpoint improvements that will increase power quality, improve safety, and reduce the cost of maintenance and repairs.

The single page Risk Mitigation summary report provides:

- Enterprise facilities graded for power quality risk.
- Potential power quality risk reduction and cost savings from moving facilities with grade F to grade A.
- Worst at-risk buildings for the current year-to-date.
- Total of voltage events year-to-date.
- Total of voltage harmonics year-to-date.
- Total of current harmonics year-to-date.
- Top 5 at-risk facilities for the current month.



Example of Risk Mitigation Summary Report

The detailed Risk Mitigation benchmark report provides explanatory material and multiple tables, including:

- Executive summary overview of results of the enterprise power quality risk analysis, with projected risk reduction and cost savings on maintenance and repairs.
- Enterprise facilities graded for energy efficiency, with square footage and occupancy information.
- Enterprise facilities ranked by their risk factor, with an explanation of the ranking process.
- Top ten facilities with greatest risk factors year-to-date.
- At-risk facilities by voltage surge, listing high, medium, and low risk facilities.
- At-risk facilities by voltage harmonics for all voltage phases.
- At-risk facilities by current harmonics for all current phases.

A page from the Risk Mitigation benchmark report is shown below.



At-risk Facilities Based on Voltage and Current Harmonics

The Risk Mitigation facility report provides detailed reliability information for all circuits in one facility. Use this report to further analyze the cause of unreliability and power quality risk in the worst enterprise facilities. The report analyzes all facility circuits and grades them, highlighting the circuits most in need of improvement. By taking steps to increase the reliability of the worst circuits, the power quality risks for the entire enterprise are reduced.

The Risk Mitigation facility report contains:

- The facility's grading information.
- Ranking details.
- Details and analysis of the facility circuits' voltage events.
- The top ten year-to-date circuits with the highest power quality risk versus the previous year.
- The top five facility circuits at-risk for voltage events, voltage harmonics, and current harmonics.
- Detailed power quality risk analysis (voltage events, voltage and current harmonics, and THD) for each facility circuit.

A page from the Risk Mitigation facility report is shown below:

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Enterprise Billing Module Provides Cost Allocation and Tenant Billing

Up to 15% Savings are Realized through Submetering and Energy Awareness Alone

- Control costs by providing tenant ownership of energy consumption.
- Determine inefficiencies and reduce energy demand.
- View consumption of all usage commodities, including water, air, gas, and steam.
- Meter virtually unlimited amounts of energy points.
- Create customized rate structures.
- Perform Time of Use billing.
- Create customized invoices and bills.
- Generate hundreds of automated bills or energy reports.
- Automatically email bills and invoices.
- Provide feedback of successful transmission for accounting purposes.
- Provide automated reporting to detail savings opportunities.
- View monthly cost summaries and comparisons.
- Eliminate any need for costly third party billing providers.

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Facility Voltage Events for the Month

Reduce System Commissioning and Eliminate Integration Problems

The EnergyPQA.com® system's meter data management is handled by the MeterManagerPQA® software module. This module automatically finds and collects data from installed facility meters, reducing commissioning and eliminating the need for internal IT and Engineering resources. MeterManagerPQA® software:

- Auto discovers and groups meters; automatically collects historical usage, power quality, and alarm data.
- Securely pushes metering data, including all logs, alarms, waveform, and PQ information, to the EnergyPQA.com[®] cloud system on an interval basis.
- Stores data locally if network issues occur, the system provides a fail-safe since all data will be pushed to the cloud once the network is restored.
- Reports on meters' communication issues and provides statistical data on communication reliability.
- Determines installation and wiring mistakes.
- Automates most tasks, reducing the need for IT technicians.

Cyber Secured Access

The EnergyPQA.com[®] system protects your data from hacking or tampering. Its encryption technology and secured access meet corporate IT security requirements. The system has rolebased authorization, encrypted passwords, and API keys, as well as network security SSL encryption and intrusion detection. EnergyPQA.com[®] monitors your metering devices and system software to ensure they are up-to-date with the latest cyber secure protocols.

EnergyPQA.com[®] utilizes cloud computing architecture. Data integrity is protected with redundant storage at the customer site and in the cloud. Data is further protected with firewalls.

Key security features include:

- Secured cloud computing architecture.
- Data stored redundantly.
- Network security: SSL encryption.
- Role-based authorization.
- Dual factor authentication, including optional TOTP authentication.
- Encrypted passwords and API keys.
- Data security: firewalls, intrusion detection, and encryption.
- One-way data push prevents breach of the network.



Meters Inside Customer Virtual Private Network

CommunicatorPQA® Application: Basic Support for All Installed EIG Metering

Meter Settings Configuration:

Configure your meters to meet the needs of your energy monitoring goals, using the CommunicatorPQA® application. The application's structure is intuitive and easy to use. Meter settings are organized into related groups and an online manual with detailed instructions is embedded in the application.

- Set up meter communication, including Com port address and Baud rate, IP address for Ethernet ports, protocols, mode of operation (e.g., Modbus RTU Client), etc.
- Configure the meter's time synchronization method and DST programming.
- Set up revenue features, such as Transformer/Line Loss compensation, CT/PT compensation, and Time of Use.
- Set up advanced options, for example, synchrophasor PMU settings, IEC 61850 settings, port control for Ethernet cards, and more.
- Perform meter testing.
- Configure and designate roles for meter security.





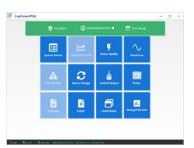
CT Ratio			PT Ratio (Line to Neutral)		
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Easily Configure Meter Settings

LogViewerPQA:

EIG's LogViewerPQA is the charting and graphing application that comes standard with CommunicatorPQA® software. This application is database driven. It normalizes data from any EIG meter, so that it is displayed in a concise, easy-to-understand presentation. This feature is useful for local meter integration. All log data is also available in the cloud. Depending on the meter, the available logs are:

- Historical Trends.
- Limits/Alarms.
- Event-triggered
 Waveforms.
- Power Quality.
- Input Status Change.
- Relay Outputs.
- System Events.
 - Flicker.
- Transients.
- EN 50160.



LogViewerPQA's Main Screen



Benefits of the EnergyPQA.com[®] Solution

The EnergyPQA.com® AI driven energy management solution yields benefits to all enterprise levels.

Enterprise CEO, CFO and CIO (C-Suite) Concerns:

Reducing costs and improving reliability of their electrical power. With C-Suite reporting, in 30 seconds they can take action to reduce costs and mitigate risk to their facilities.



How will they use the EnergyPQA.com[®] System?

- Analyze enterprise level energy metrics.
- Determine and reduce total carbon footprint.
- View custom reports on usage and max demand.
- Compare energy efficiency between facilities.
- Evaluate past performance vs. future predictions.
- Improve power system reliability.

Facilities VP and Director Concerns:

Reducing energy costs and improving reliability of their electrical power.



How will they use the EnergyPQA.com® System?

- Identify the least efficient buildings and potential savings to improve them.
- Access energy usage enterprise wide using online dashboards.
- Report on current usage and demand with future predictions.
- Identify overall risk factor for power quality.
- Receive alarm emails of poor power reliability.
- View System Status webpage, showing status of facility meters.

Engineer/Technician Concerns:

Keeping the power system up and running.



How will they use the EnergyPQA.com® System?

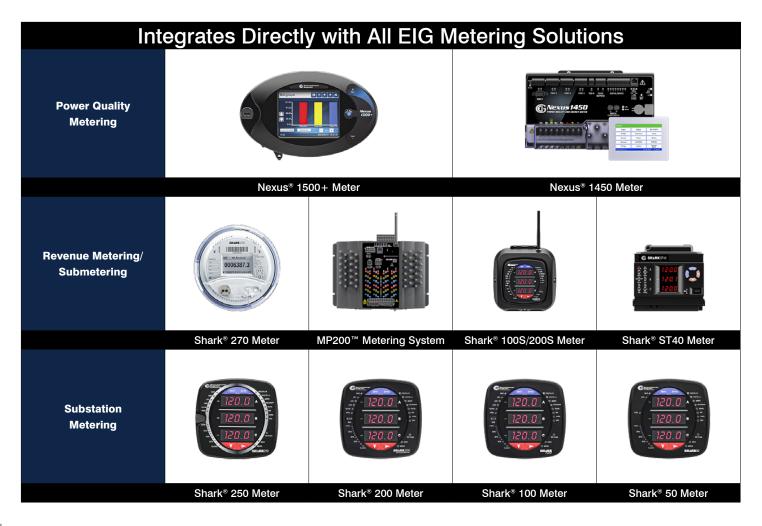
- Identify highest risk circuits that need infrastructure remediation.
- Diagnose maintenance and power quality problems.
- Determine overall risk factor for power quality.
- Receive email alarms on out-of-limit and power quality events.
- Determine leaks and wasted resources within the facility.

Enterprise Wide Benefits

- Up to 15% savings of your electrical energy budget year after year through submetering and energy awareness alone.
- Immediate and significant cost savings by implementing even modest demand reduction.
- Reduce costly demand charges that can be as high as 50% of a facility's actual consumption.
- Prevent downtime, improve efficiency, and reduce liability.
 30-40% of all commercial downtime is power quality related.
- Grade facilities and circuits for efficiency to take meaningful action to improve enterprise energy efficiency.
- Identify facilities and circuits with the highest power factor risk to focus power quality improvements where they will have the most impact.

- Monitor sustainability and green initiatives with enterprise wide carbon footprint analysis.
- Ease of deployment, to have the system up in days vs. years.
- Quickly troubleshoot faults with automated dashboards, reporting, and diagnostic data downloadable to csv files.





EIG's Industry Leading Engineering Services Team

EIG's Engineering Services team consists of highly skilled and talented engineers with a variety of expertise in the fields of electrical engineering, software engineering, and meter engineering.

What Can We Do for You?

The Engineering Services team is available to work directly with you, offering world-wide support and a work schedule tailored to meet your needs. The team offers onsite commissioning and consulting services, providing system integration solutions for your specific application. They also provide flexible customerfocused training that covers all EIG solutions, and which is available through webinar or in person, onsite, or offsite classes.

- Maximize your energy monitoring investments.
- Optimize and improve uptime of your new software or hardware.
- Evaluate and mitigate power quality issues.
- Create a condition-based maintenance schedule.
- Meter recalibration and recertification.
- Generator meter testing and commissioning.
- Onsite and remote support.
- Receive hardware and software updates.
- Site supervision and certification of installations.
- Receive site staff (Engineers and Electricians) training.

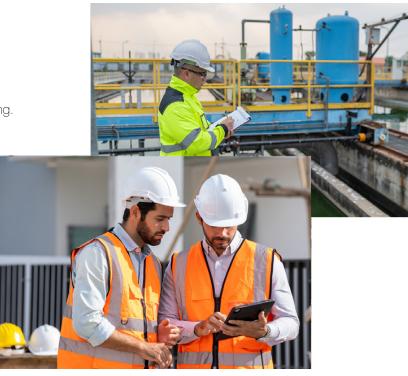
Commissioning Services

When you use the Engineering Services team to commission your meters, they will verify meter installation and wiring and proper system integration. They will work with third parties to ensure cross compatibility and advise you on best practices for optimal implementation. In addition, the team can assist with troubleshooting and correcting pre-installed systems, which can include equipment not manufactured by EIG.

Consulting Services

EIG's Engineering Services team is available for remote or onsite services, master service agreements, and training. Training classes are now offered both virtually and in person:

- EIG offers free two-day training classes around the US, every year.
- If you and your team are not able to attend the free class, Engineering Services can create a custom class that meets your exact requirements and covers the EIG products you will be using. The team will provide either onsite or webinarbased training to ensure that your staff is knowledgeable about all aspects of the products.
- Instructors are RCEP (Registered Continuing Education Program) certified and all training can be certified for continuing education credits.





Ordering Information						
Software Module	Description	Model Number	Details			
EnergyPQA.com [®] System	Al Driven energy management system (ten meter minimum)	EnergyPQA	Enterprise wide cloud energy management; includes other listed software modules			
	DataLink™ API Feature	DLAPI	API for exporting EnergyPQA.com® system data			
CommunicatorPQA® 6.0 Pro Application with MeterManager- PQA®	Basic Professional license seat, one user; includes MeterManagerPQA® software and Report Exporter	COMPQA6P	Add automation, system comparisons, meter diagnostics, and enterprise meter management			
EnergyReporterPQA™ 6.0	Billing and usage reporting software	ERPQA6	Energy dashboard, reporting, and billing add-on for EIG meters			
Commissioning	Verification of meter installation and proper system integration. Advising on best practices and cross-compatability	application with MeterManagerPQA® software to successfully run the EnergyReporterPQA™ application. If you purchase licenses for				
Meter Training	issues. Training by RCEP instructors on all EIG solutions, available through webinar, onsite, or offsite.					

Meet the EIG Team

Electro Industries/GaugeTech (EIG) strives every day to be the best and most reliable provider for power and energy metering, power quality, and energy management. EIG ensures success with our dependable metering technology, our advanced cloud software, and our world-wide field engineering support. We have a long history of innovation, including hardware, software, artificial intelligence, IOT, and advanced reporting. Contact our sales engineering team at EIG sales@hubbell.com or 516-334-0870 for help with building a solution for your specific application.

Trademarks

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