



EcoStruxure™ Power

Power Quality Performance eGuide





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EcoStruxure Power digitizes electrical distribution

EcoStruxure Power helps facility operations teams ensure power reliability

Large buildings and critical facilities are especially dependent on reliable power. Power-related issues are increasingly common and can be difficult to manage. Increasing use of electronic devices such as drives, PLCs, and so on only make this challenge more pervasive.

Increase electrical system and asset reliability through PQ management

Digitization of the electrical distribution helps bring greater visibility, insights, and decision support to help demystify the complex power quality issues that can impact the operations and longevity of critical assets.

[Read the PQ white paper](#)



Digitizing Electrical
Distribution



Challenges and
Opportunities

Application
Overview

Digital
Architecture





Challenges and Opportunities

Digitizing Electrical
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Challenges and
Opportunities



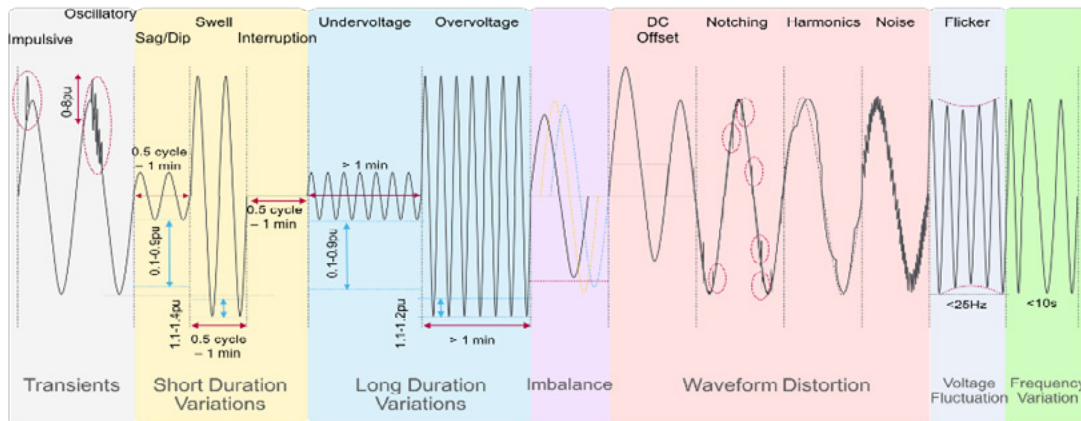
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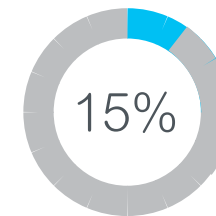
What is power quality?

In an ideal 3-phase power system, voltages are at nominal magnitude and frequency, balanced with a perfect sinusoidal waveform. Any disturbance on one parameter (magnitude, frequency, waveform, or symmetry) is classified as a power quality problem. There are a variety of power quality disturbances, all of which can have negative impacts on the electrical system and equipment – such as power outage, device damage, failure, overheating, degraded performance, and reduced equipment life.

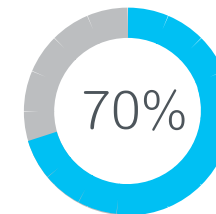


Why should I care about power quality?

Power quality issues can go unnoticed and have a major impact to operations or processes. Equipment can be critically damaged or its useful lifetime degraded. These issues are more common than many expect.



15% of facilities operate with problematic power quality conditions, which could lead to equipment damage and unplanned downtime



70% of power quality disturbances originate within facilities, and cause 30-40% of resulting downtime incidents

Methodology for managing power quality

Measure

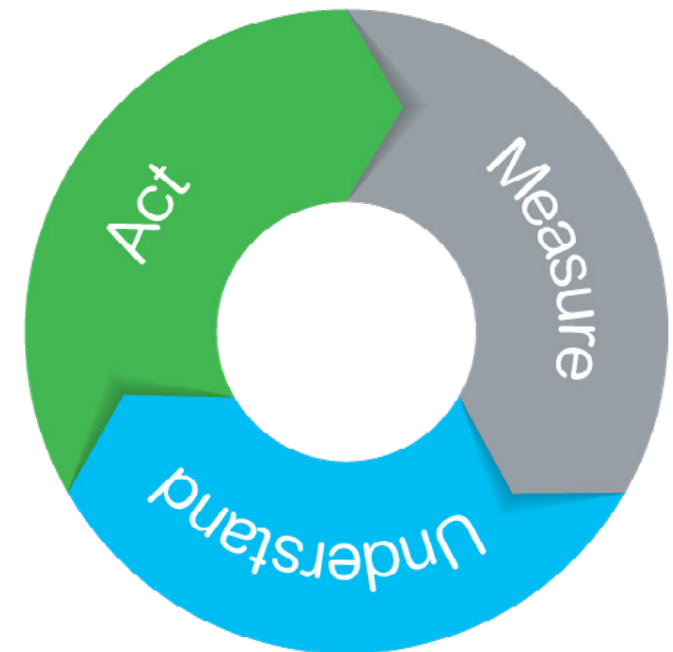
- Permanent monitoring helps identify events and disturbance impacts and trends on a continuous basis, which periodic PQ audits won't always capture
- Performed by measurement devices and software per common guidelines and standards or regulations.
- Data quality analytics find misconfigurations that can skew data, and thus decisions made on that data.

Understand

- Analysis of events on a timeline basis to reconstruct the cause
- Interpretation of the power quality data and the impacts to the process and equipment
- Advisors help de-mystify complex power quality issues through optional expert analytics

Act

- Different solutions can be considered, based on interpretation results and conclusions
- Advisor services provide a consultative approach to improving facility power quality



[Read about PQ management methodology](#)

IoT enabled applications for greater power quality performance

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Power quality performance

How can you ensure electrical system and asset reliability?

Power Quality Monitoring

Power Quality Correction

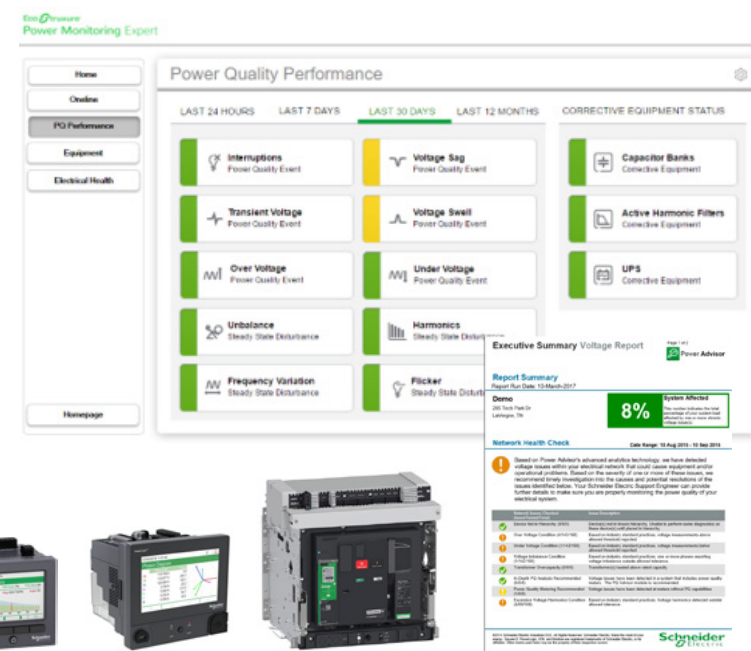
Power Quality Compliance

Data Quality Management

Permanent power quality monitoring

- Monitor persistent electrical disturbances such as harmonics, unbalance, flicker and over/under voltage conditions
- Capture and study event details such as waveforms
- Patented Disturbance Direction Detection to locate the directionality of events
- Trend and report on power quality issues to understand potential issue that could affect operations
- Gain expert advice with analytics advisory services to improve performance across the system

I want to have the information to identify power quality issues and manage their impact to keep them from disrupting operation or damaging my critical loads and equipment.



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I want to protect my sensitive equipment from power quality issues like harmonics, voltage sags/swells, flicker, transients, or brief interruptions to avoid any impact on business operations.

Correcting power quality issues

- Achieve compliance with any harmonic standards
- Ensure energy efficiency by optimizing transformer and cable capacities; reduces utility power factor penalties; and saves the cost of generation and transmission of reactive and harmonic current (non-active currents)
- Correct abnormal voltage conditions such as over/under voltages, harmonics (THDi, THDu), and more that affect critical equipment like transformers, drives, and PLCs
- Protect sensitive equipment from brief interruptions



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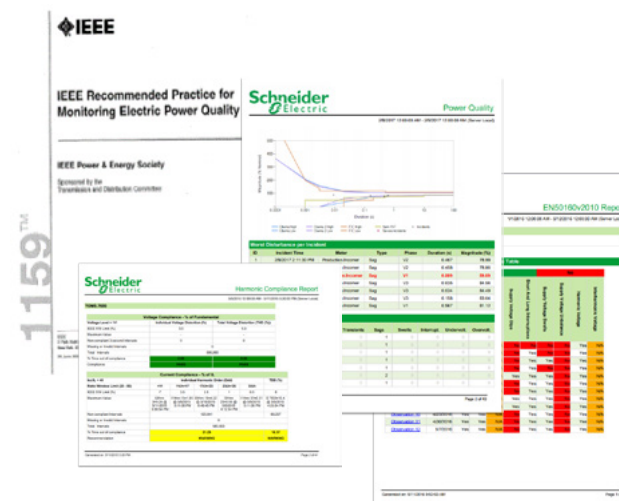
Power Quality Compliance

Data Quality Management

“I want to comply with international or local power quality standards and identify issues with my power, and if needed, make claims to my utility in case of problems.”

Ensuring compliance with international standards

- Continuously monitor specific power quality measurements on the incoming service and key feeders throughout the facility
- Visualize and report on power quality related data that exceeds the bounds identified in common standards
 - EN50160 – European standard for industrial and commercial networks
 - IEEE519 – Global standard for voltage and current harmonics
 - IEEE1159 – US quality standard
 - IEC61000-4-30 – International PQ measurement techniques standard
- Utilize industry standard power quality event analysis tools like CBEMA-ITIC and SEMI F47 to determine if power quality conditions are affecting sensitive equipment



Power quality management

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“I want to ensure my system is configured properly throughout its lifetime of operation so I can make decisions based on accurate information.”

Building a solid data foundation for proper power quality decision support

- Regular system health checks (for missing or incorrect data, devices missing in the hierarchy, stagnant or misreported values, devices reaching the end of their supported life)
- Recommend ways to improve data quality and system performance to ensure system reliability and meet ISO5001 standards
- Enable good decision making and improved operations by providing the right data
- Provide expert support throughout the lifecycle of your system to keep it current



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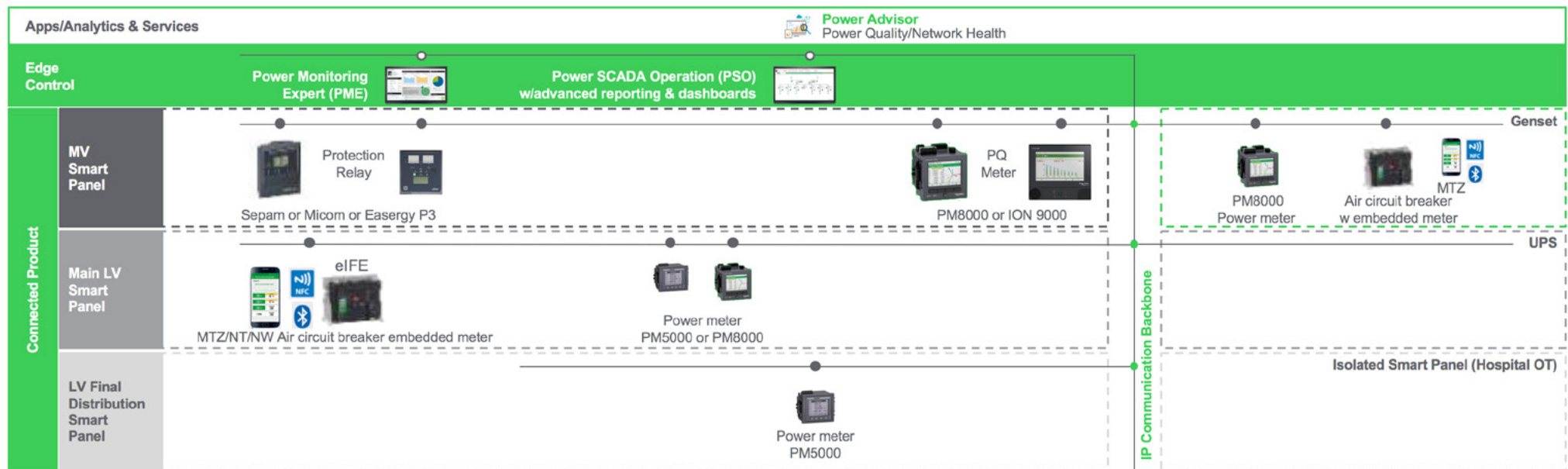
Architectures

Architecture 1

Architecture 2

Power quality monitoring, compliance, and data quality management

A common architecture of permanently installed power quality instruments (PQI) enables continuous monitoring, capture, and reporting of power quality information. This enables optimal power supply to critical equipment. Analytics on this data ensure a good foundation for interpreting power-related issues and responding accordingly to optimize reliability of critical equipment.



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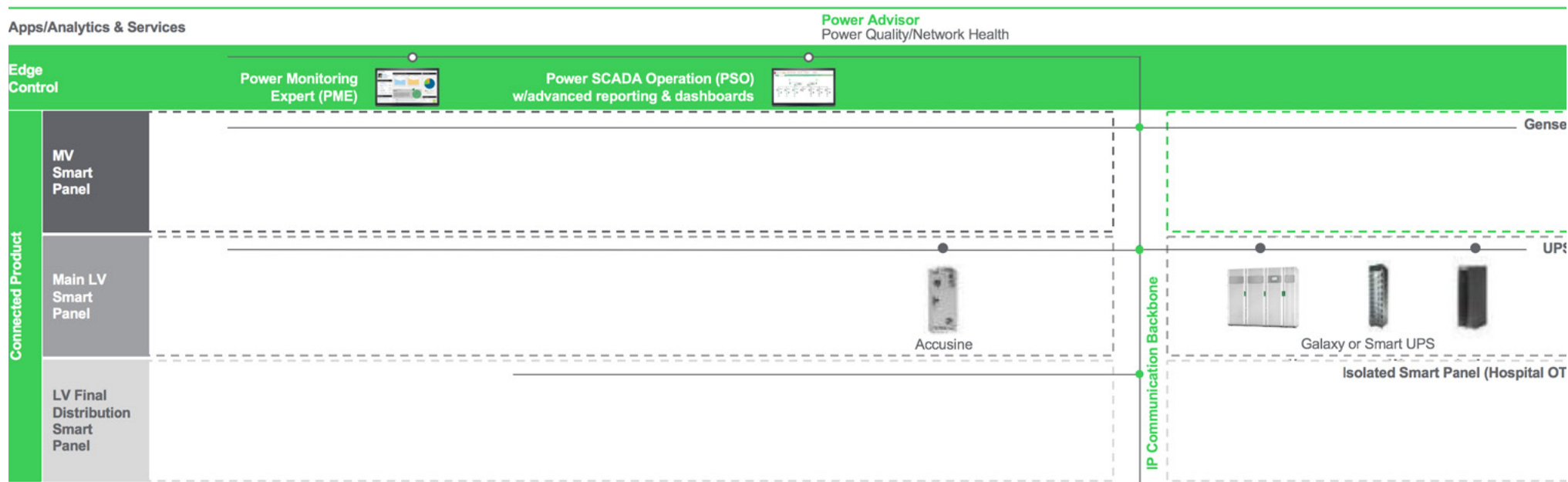
Architectures

Architecture 1

Architecture 2

Power quality correction

Power quality issues can affect multiple aspects of your business, with a long list of destructive and costly effects. You may be losing money and productivity without even being aware of it. Conversely, the benefits realized from power quality correction can be multi-fold and long lasting, improving your operations and your bottom line.



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Learn more



White paper: A Framework for Implementing Continuous, Iterative Power Quality Management.



Video: EcoStruxure Power and EcoXperts deliver clean power



White paper: Using Color Codes to Simplify Power Quality Analysis.



Contact us to start your journey.

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