Power Quality Analytics

Power quality monitoring service
for improved grid operation

SIEMENS

Power quality issues

Minor causes, serious consequences

Events like harmonics, voltage fluctuations and dips or transients can have a sensitive impact on the quality of power supplies. In extreme situations, they can lead to a failure of electrical equipment and to serious power and production outages.

In the past, detailed analyses were often conducted only after a fault had occurred. Power Quality Analytics (PQA) now combines permanent power quality measurements with both artificial intelligence (AI) analytics and expert known-how in a service for detecting impending damage and preventing outages. With this service, you can achieve maximum power supply availability and minimize outage costs with preventative measures.

Power Quality Analytics detects critical network states in advance and helps remedy these issues before they can negatively impact your power system and day-to-day business.
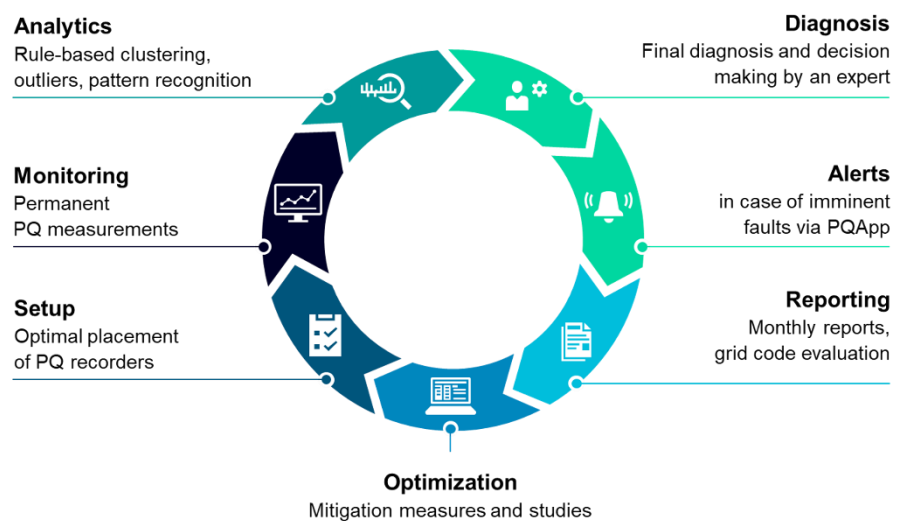
Scope of services

We continually monitor and record critical grid data by measuring power quality directly on site. Thanks to our remote access via a secure data platform, we can analyze your power grid using advanced algorithms and AI methods to identify possible weak points. Our simulation tools provide a detailed digital depiction of the grid and enable us to define targeted countermeasures with you. The acquired information continuously flows into and further optimizes our AI system.

Our PQA service includes:

- Optimal positioning and installation of SICAM measuring devices
- Data transfers to Siemens' servers via Scalance routers and a secure IT infrastructure
- Continuous monitoring and analysis of power quality over a predefined timeframe
- Regular reporting and recommendation of suitable risk-minimizing measures
- Additional power system consulting services on request

Holistic solution: From the selection and positioning of suitable measuring devices to proposing mitigation measures

Analytics
Rule-based clustering, outliers, pattern recognition

Monitoring
Permanent PQ measurements

Setup
Optimal placement of PQ recorders

Diagnosis
Final diagnosis and decision making by an expert

Alerts
in case of imminent faults via PQApp

Reporting
Monthly reports, grid code evaluation

Optimization
Mitigation measures and studies

Scalable to your needs

Our service includes user-specific packages ranging from simple measurements to comprehensive consulting services – for a high degree of choice and flexibility.

Project planning
• Definition of measuring points
• Plug-and-play system
• Commissioning support

Power Quality Analytics
• Minimum of six months
• Monthly reports
• Specialist contact
• Direct access to results via the mobile PQApp

Additional services
• Emergency reports: Immediate analysis of events
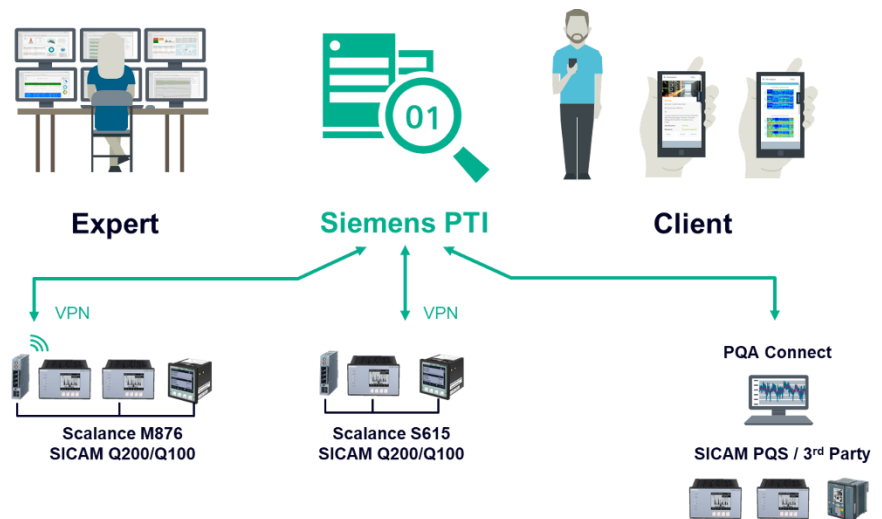• Advanced network consultancy upon request and on an hourly basis

Measurement setup and commissioning

PQA processes current and voltage signals from locally installed SICAM power quality recorders. The number of measuring devices needed and optimal positioning of the measuring points depend on the respective grid system.

In the simplest case, the measuring devices are connected wirelessly via LTE to the PQA VPN network using a VPN router. The Siemens VPN solution, SINEMA RC, is used for the connections. The VPN server creates a secure VPN network with the locally installed VPN routers of the Siemens Scalance series.

The measured value files are cyclically read out by the measuring devices and immediately processed in the Siemens PTI cloud servers. This cloud environment is operated according to the Siemens security guidelines for servers. A state-of-the-art system architecture supports the use of current safety procedures.

Open system: Secure connections
of Siemens SICAM devices and
support of third-party solutions

Expert   **Siemens PTI**   **Client**

VPN   VPN

Scalance M876
SICAM Q200/Q100

Scalance S615
SICAM Q200/Q100

PQA Connect

SICAM PQS / 3rd Party

*Data analyses with
advanced AI and
evaluations based on
specific grid
requirements – backed
by the experience and
know-how of our
experts.*

Data analytics and artificial intelligence

Knowledge-based approaches for analyzing and classifying recorded data are an
important pillar of our service. Artificial intelligence methods play a key role here,
enabling us to incorporate our expert knowledge and experience in software.

Machine Learning and/or Deep Learning enable the recognition of unusual measured
values and the classification of events by comparing them to historical recordings.
These rule-based evaluations are an indispensable tool that allows experts to focus on
their primary task: avoiding faults and preventing damage in your power system.

Power quality expert

All steps of the PQA process, from data collection to transfer and analysis, are
automated. For the final classification, however, PQ experts have the final word: they
can agree with or correct the system's suggested diagnosis. In any case, the
automated diagnostic process is continuously improved and expanded.

In addition, our grid planning experts can always be contacted for queries and advice.
If needed, we recommend measures that will lead to optimized and more reliable grid
operation. These recommendations are not restricted to power quality topics but can
also cover topics like grid protection, system dynamics or grid structure planning.

The PQApp: Mobile and direct access to the PQA dashboard

Rapid response is crucial – both in terms of recognition as well as communication between you and our experts. With our app, you will immediately receive warning messages about critical events and always have an overview of all measuring points and analysis results. An integrated contact function enables easy exchanges of information.

The PQApp runs smoothly on iOS or Android devices.

Why Power Quality Analytics?

- Avoid production losses through early and reliable detection of abnormal events in the system
- Identify and evaluate faults
- Analyze root causes to identify appropriate improvement measures

Contact

Do you have further questions or are you interested in a personalized offer? Use our contact form on our web page. Our Power Quality experts will contact you immediately.