

We take care of it.



Keeping an eye on power quality

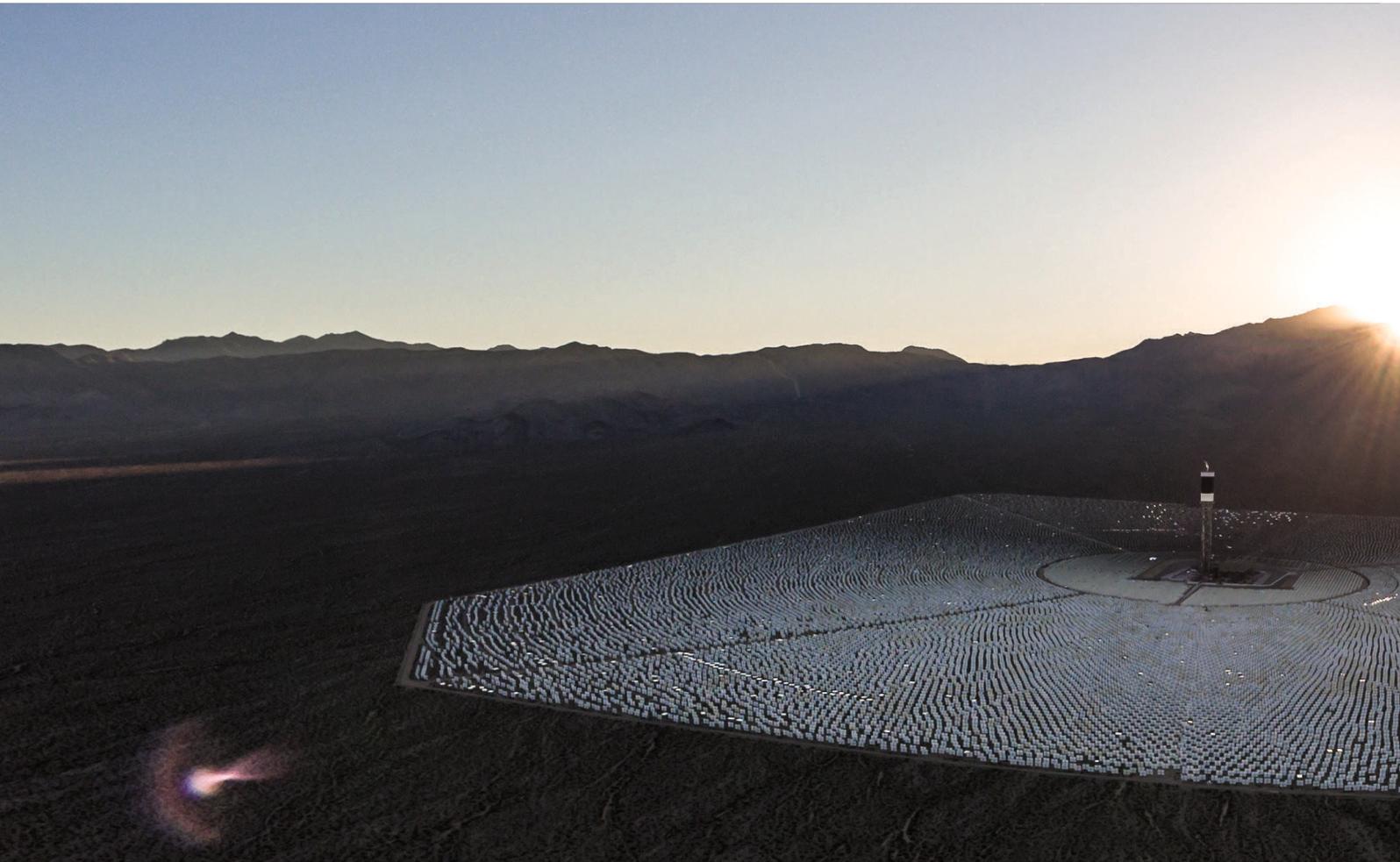
Power quality system with WinPQ visualization software



WinPQ



THE system solution for power quality monitoring, installed fault recorders and energy measurements in high, medium and low voltage grids



Electrical grids are currently undergoing radical change. Active power electronics as used in switching power supplies and inverters are ubiquitous. To achieve CO₂ reduction goals, small, renewable energy generators are being installed everywhere. Big, conventional power plants are disappearing.

Phenomena such as backfeeding, equipment overloads, voltage spikes at feed-in points and asymmetries are part of day-to-day business. This is a problem for highly optimized data centres and industrial controls that are sensitive to short dips in supply, harmonics and transient events. Even the stability of the grid is vulnerable.



The German Federal Court only ruled in 2014 that electricity also falls under the German product liability act. Ergo: Distribution grid operators are liable for damage caused by poor voltage quality.

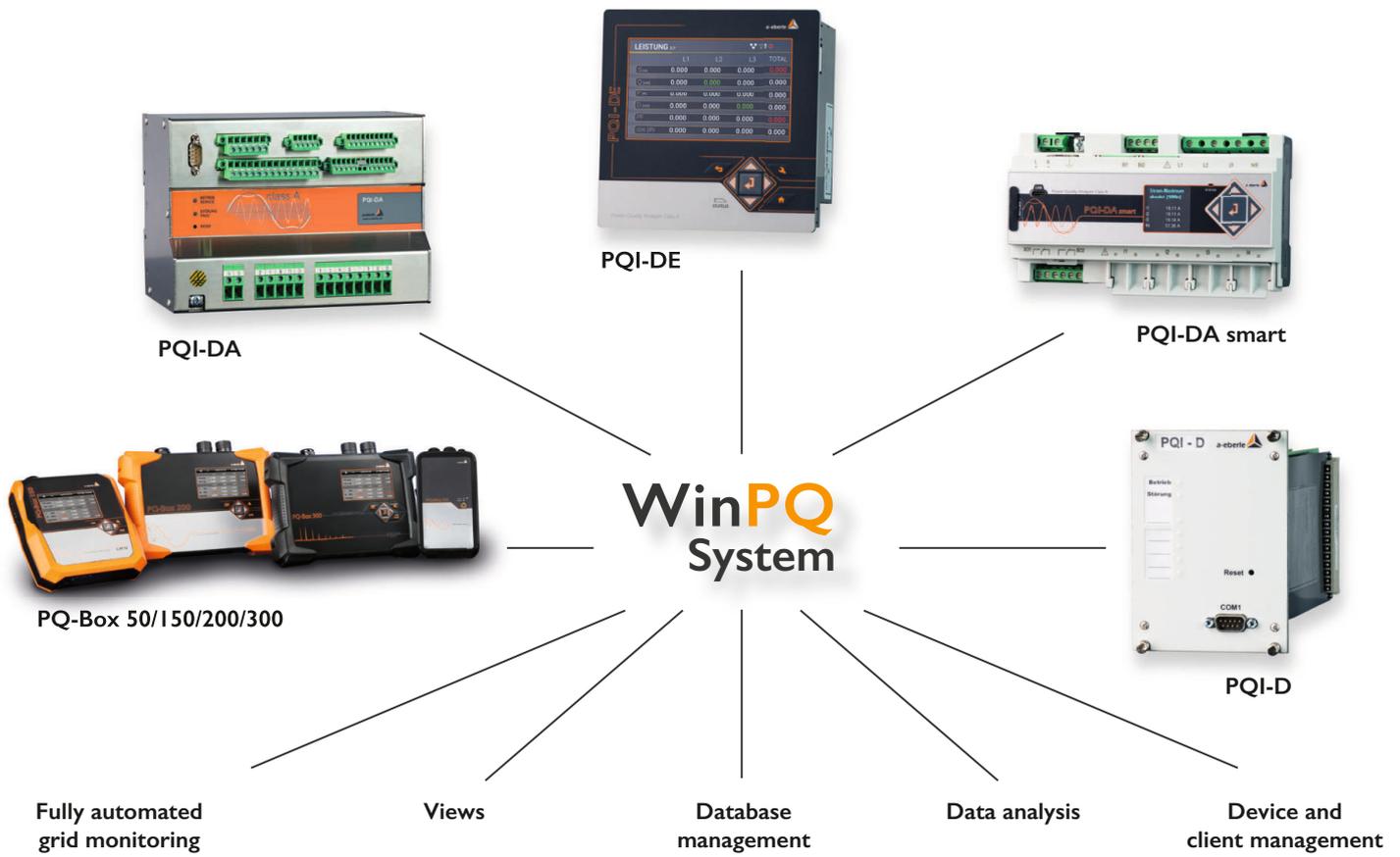
With the combination of the Class A-certified PQSys family of measuring devices and the fully automated WinPQ server solution, A. Eberle offers a comprehensive voltage quality system that will stand up in court. It enables users to document, evaluate and prove the quality of the voltage at any time. Faults can be detected, the source determined and the cause remedied early.

All of the installed fault recorders and mobile grid analyzers from A. Eberle are supported and can be connected across grid levels, in

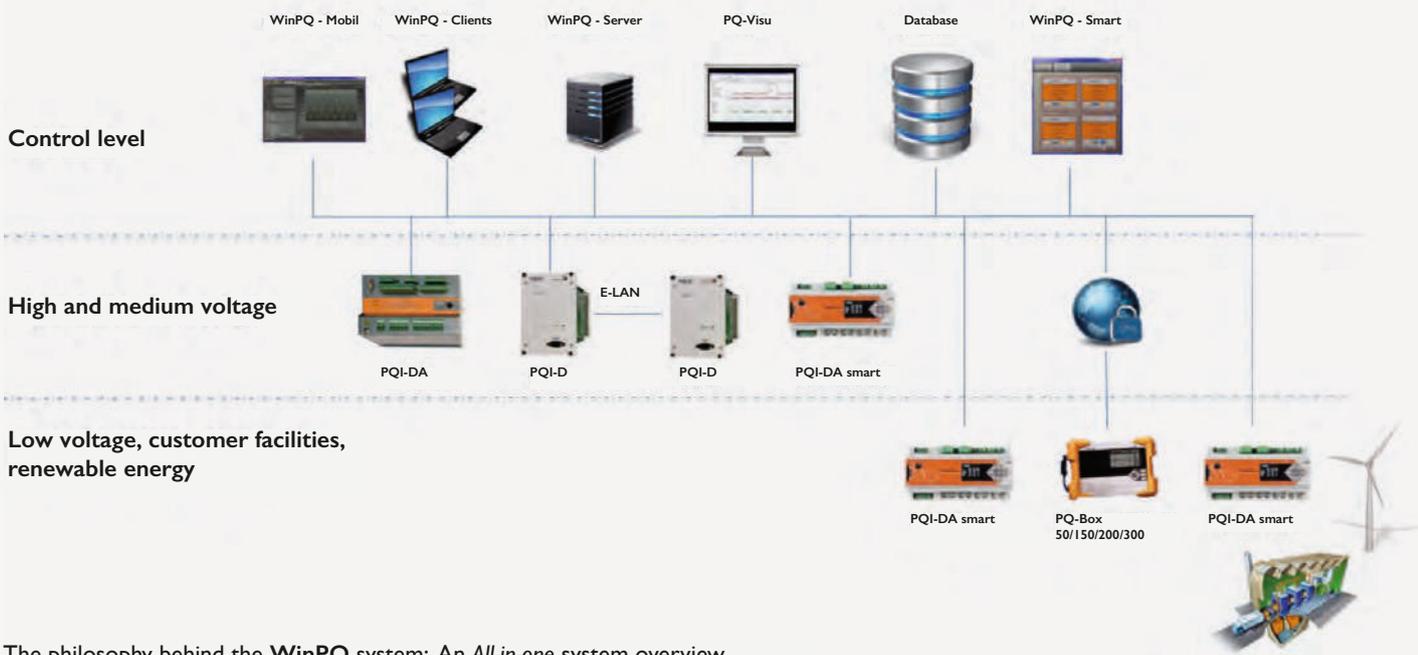
large numbers, to an SQL database server. Communication over SCADA protocols, such as IEC 61850, Ethernet, 3G/4G and analogue dial-up modems is possible.

The WinPQ software is at its absolute best when it comes to controlling large amounts of data. Automated reporting assistants automatically explore the database and report only the things you need to see. You can receive standards reports and alerts by email or in standard formats such as Comtrade, PQDiff or as a PDF document on the hard disk. It's that easy!

Our fine-tuned hardware and software solution enables you to keep an eye on the voltage quality at all times.



WinPQ - System solution for all installed fault recorders, power quality monitoring devices and mobile grid analyzers by A. Eberle. Continuous power quality monitoring – from high voltage to the end customer as a system. Intuitive despite a large amount of data.



The philosophy behind the WinPQ system: An All-in-one system overview

Keeping an eye on power quality

Unique: Power quality system with WinPQ visualization software

WinPQ database software

The WinPQ client-server software with database is an intelligent system solution that automatically monitors faults and the grid quality in parallel across several measuring devices. Different device versions are available for different requirements and voltage levels. The evaluation software supports all installed A. Eberle fault recorders. TCP/IP, fibre optics, RS-232, 3G, 4G and analogue modems can be used to communicate with the devices.

In addition, all of the data measured by the mobile grid analyzers can be imported into the database and correlated with the data on the installed devices.

The database is generally installed on a server to guarantee it's always running. The database supports any number of concurrent WinPQ clients.

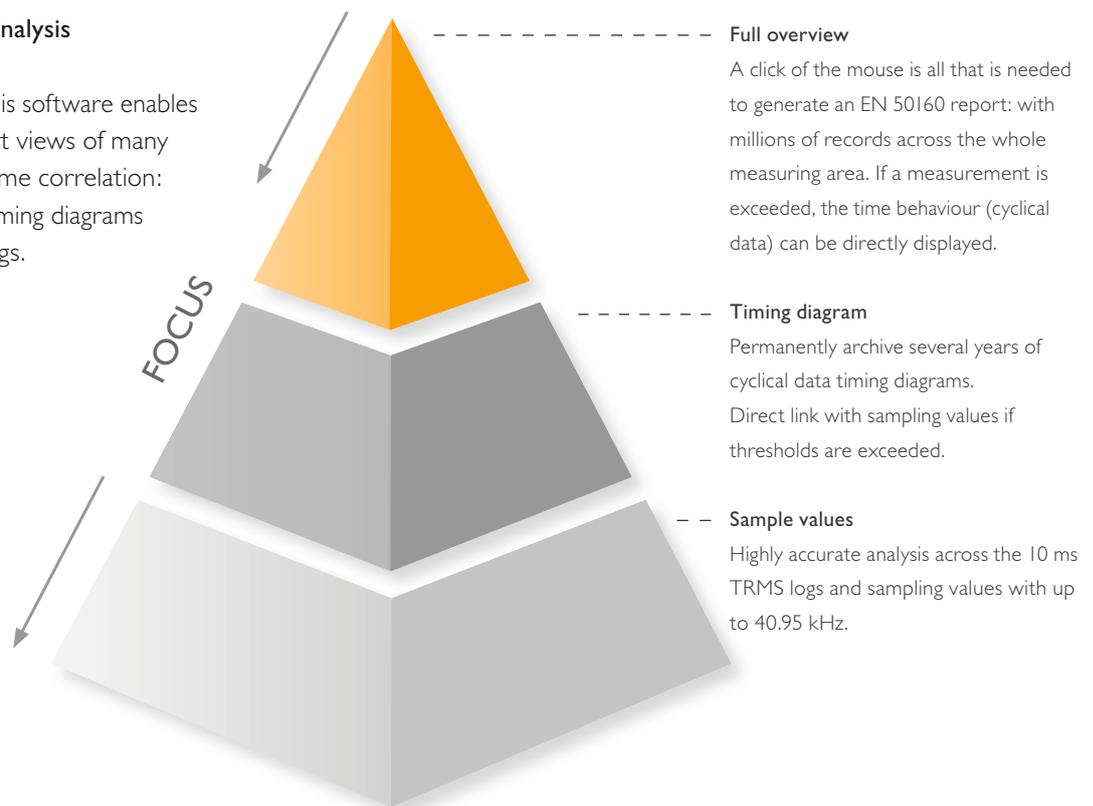
The system's key features include:

- All devices are read concurrently. This assures the system's fast response time.
- Automatic error log reporting and automatic creation of power quality reports, also for the control room.
- User-friendly software that enables you to easily monitor the many devices and large amount of data.

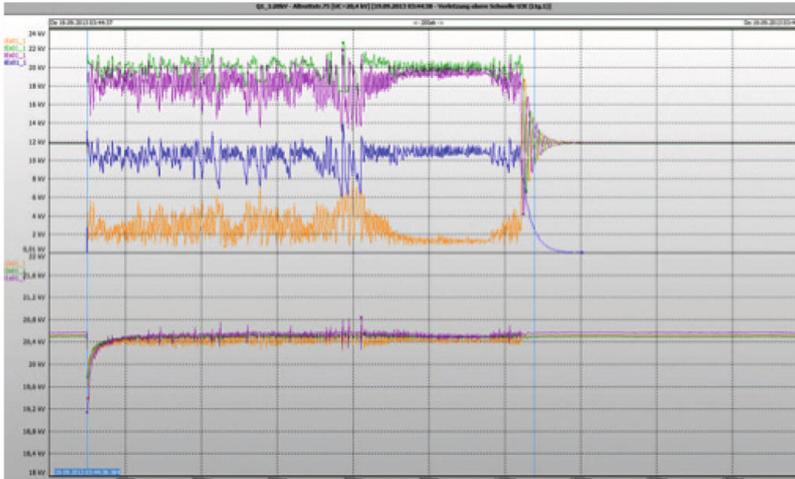
WinPQ can be used with **Oracle PostgreSQL** and a **free database**.

The principle: Top-down analysis

The WinPQ database analysis software enables you to easily create abstract views of many measurands that have no time correlation: from the measured data's timing diagrams to highly accurate error logs.



Fault recorder

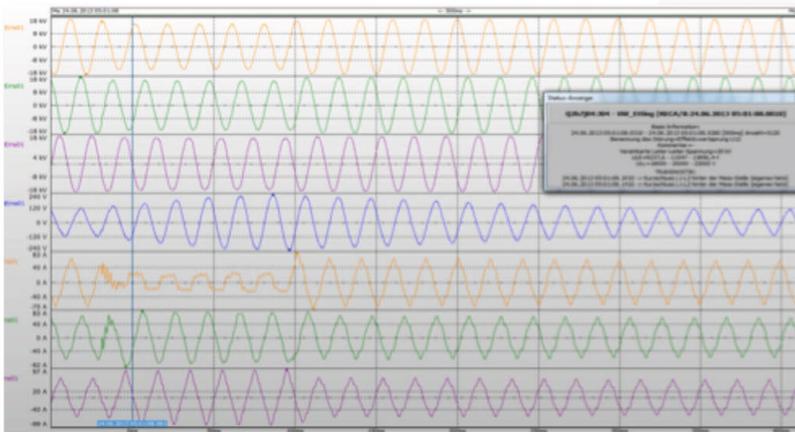


½ period recorder TRMS average values of all voltages (phase-to-phase and phase-to-ground), currents, active power, reactive power, apparent power and frequency

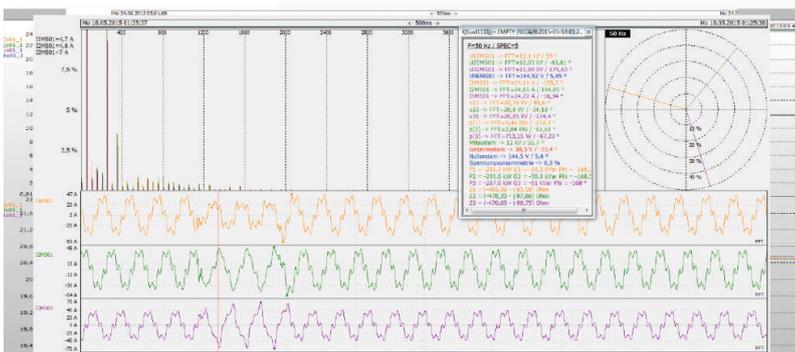
The devices have several fault recorders with different sampling rates with different levels of detail and recording lengths. There is an extensive menu of trigger criteria for recorders. The duration and pre-event time are user definable.

The devices have the capability of adjusting the recording length independently of the fault duration on the grid.

The WinPQ system can display several error logs from different installed and mobile grid analyzers in a diagram. Messages, PQ events and binary signals can also be displayed and used in other calculations and correlations with measuring data.



Oscilloscope recorder with 10 kHz – 40 kHz sampling rate



Extensive analysis options and FFT calculation functions



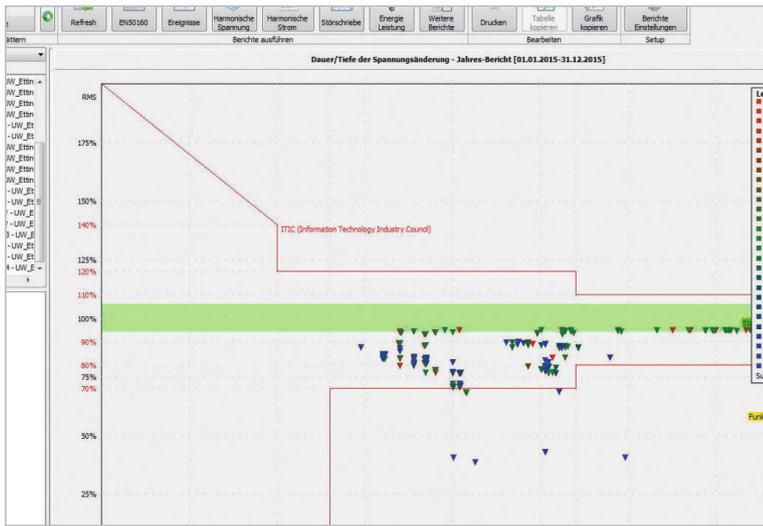
Power quality report and statistics



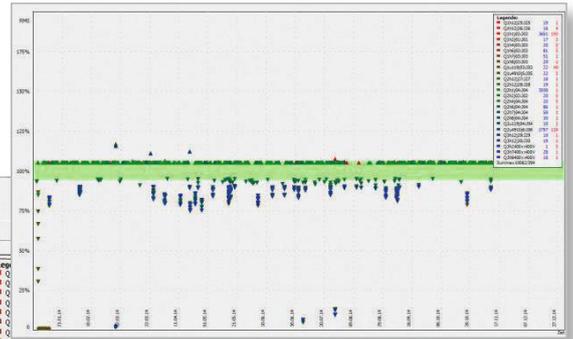
WinPQ offers an extremely wide range of power quality reports and statistics. There are detailed reports per measuring point and overview reports for a group of devices or voltage level or grid area.

ITIC report examples

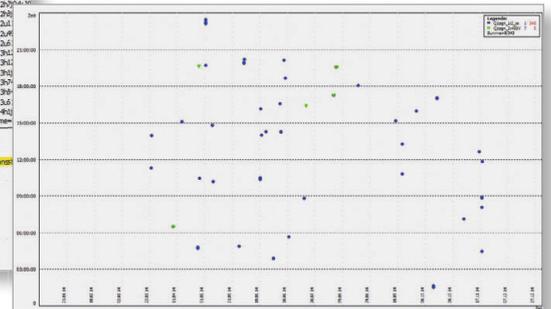
The graphic shows all voltage events in a device group over an arbitrary period of time. The error log is accessed from the event.



Voltage dips and swells sorted by date and duration

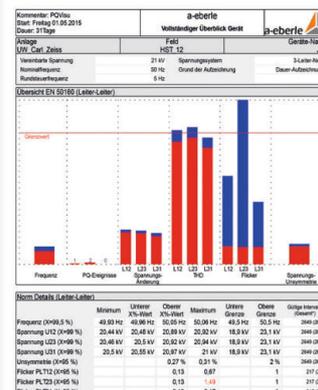
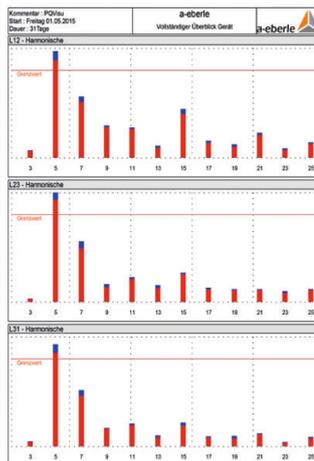
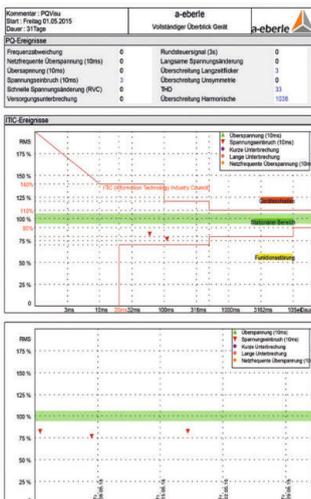


Voltage dips and swells sorted by date and depth



Voltage dips and swells sorted by time and depth

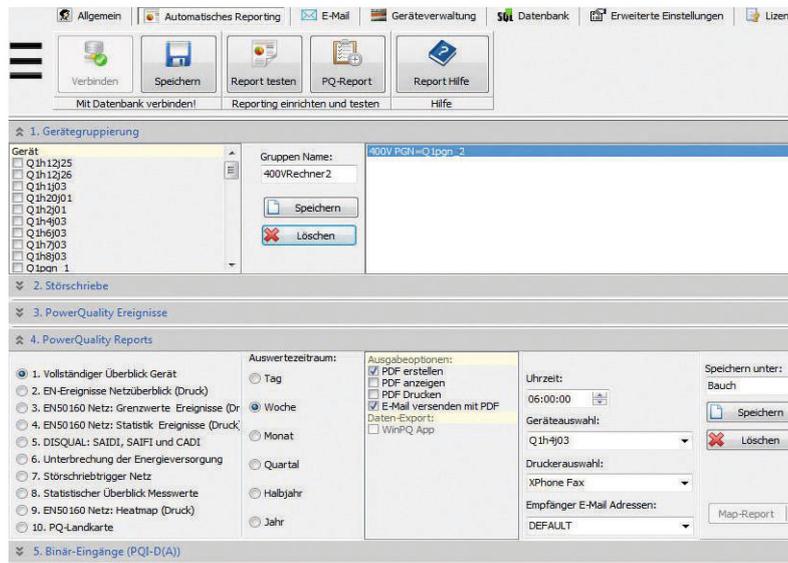
EN 50160 report examples



Parameter	L12-95%	L12-Max	L23-95%	L23-Max	L31-95%	L31-Max
Überspannung (10ms)	4%	7,405%	8,14%	7,993%	8,325%	7,885%
Überspannung (10ms)	2%	-	-	-	-	-
Überspannung (10ms)	5%	0,37%	0,425%	0,188%	0,189%	0,278%
Überspannung (10ms)	1%	6,037%	7,226%	6,993%	7,405%	6,954%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0%	3,181%	2,492%	3,073%	3,485%	2,975%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	0,629%	0,552%	0,265%	0,265%	0,378%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	1,192%	1,221%	0,957%	0,996%	0,908%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	0,331%	0,417%	0,481%	0,571%	0,363%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	0,247%	0,279%	0,157%	0,189%	0,117%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	2%	0,227%	0,385%	0,284%	0,324%	0,195%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	0,194%	0,229%	0,183%	0,218%	0,132%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	0,127%	0,142%	0,085%	0,073%	0,085%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	0,108%	0,158%	0,158%	0,188%	0,082%
Überspannung (10ms)	0,5%	-	-	-	-	-
Überspannung (10ms)	0,5%	0,24%	0,294%	0,229%	0,279%	0,141%

Double-clicking on one of the points opens the corresponding error log

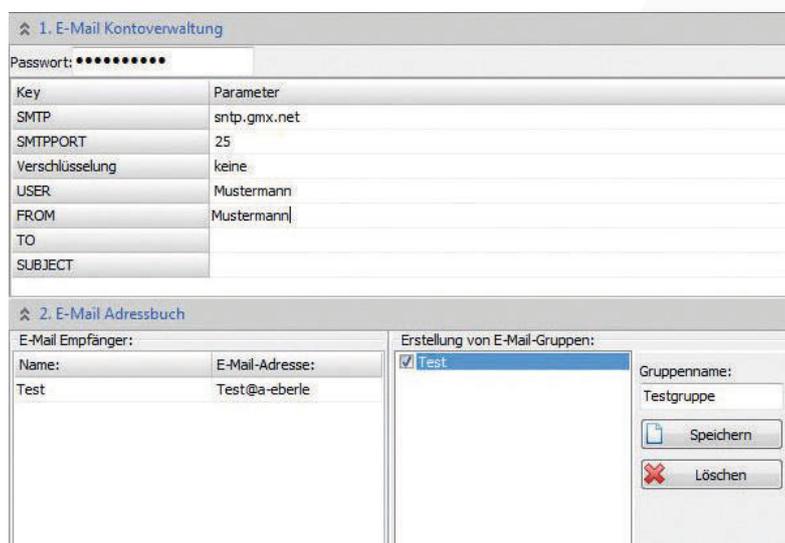
Automatic reporting



The devices automatically send faults to the database as soon as they occur. PDF documents are created automatically and can be sent to email addresses or printers.

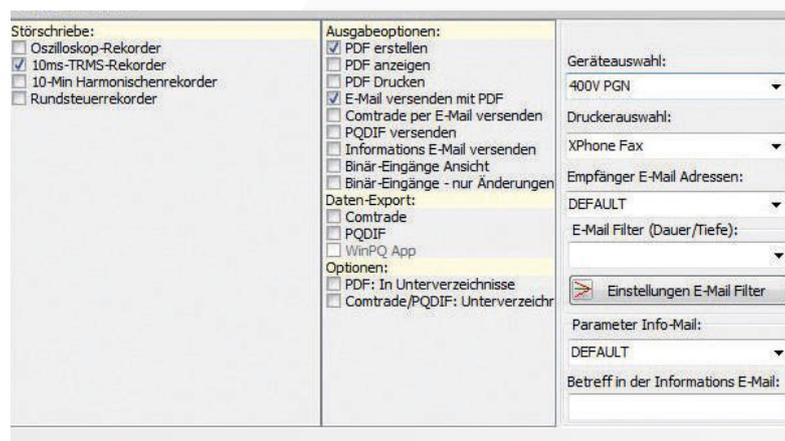
The system automatically archives power quality reports and long-term statistics. 3D graphics help keep track of the many devices in a grid area or voltage level.

Alert management

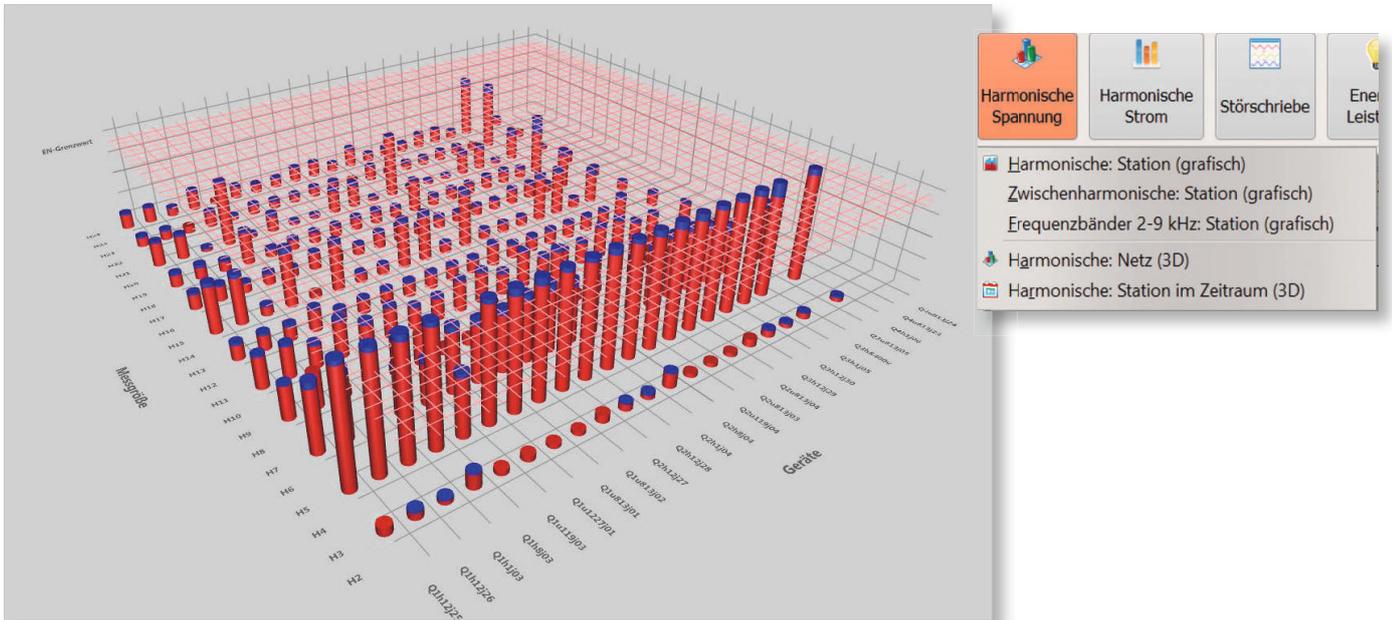


A separate flow plan can be created for each measuring point: Which fault from which event size should be reported to whom?

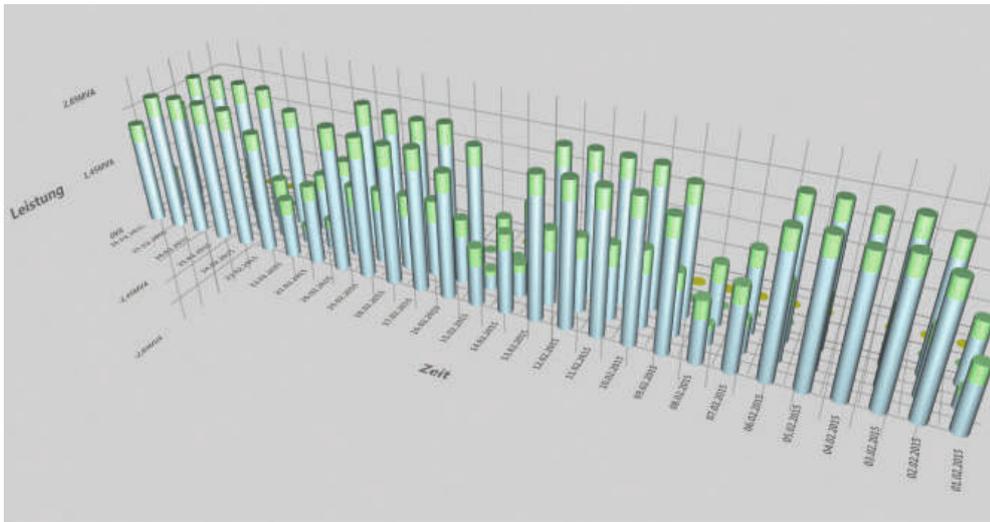
Alerts can be reported optically, acoustically or by email and text message. Acknowledge functions, pop-up windows and sound are available to report alerts.



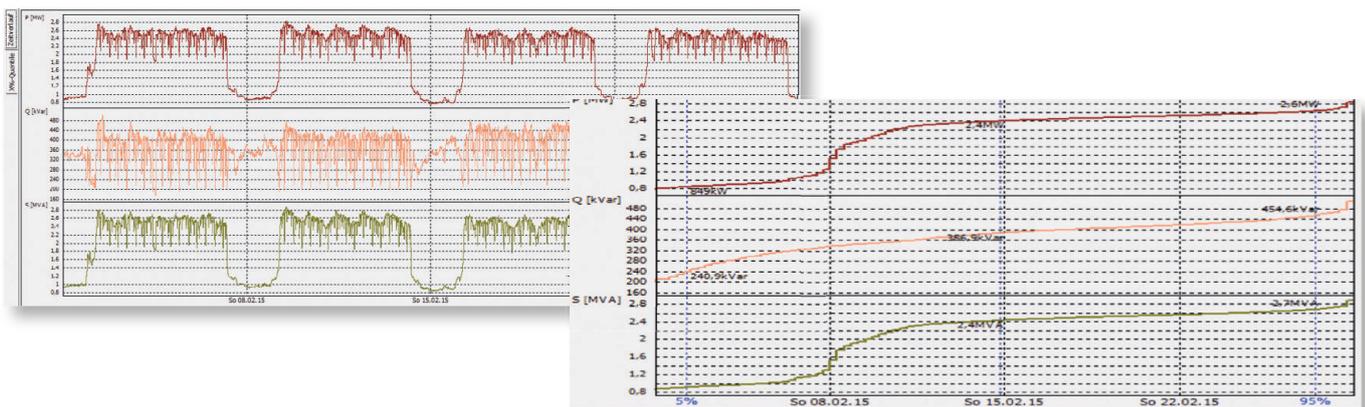
3D and 4D graphics



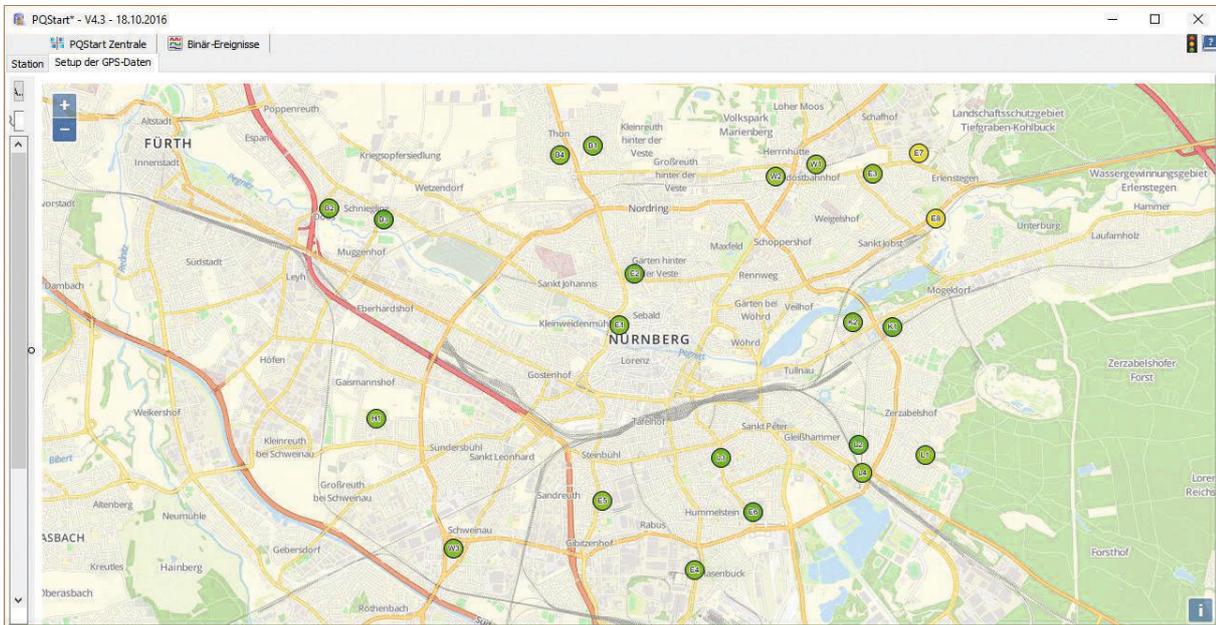
3D and 4D graphics provide an overview of many stations across several measured values



Analysis of the load profiles of several stations across arbitrary periods. Clicking on a bar opens the timing diagram for this situation or the cumulative frequency analysis (see below).



Maps

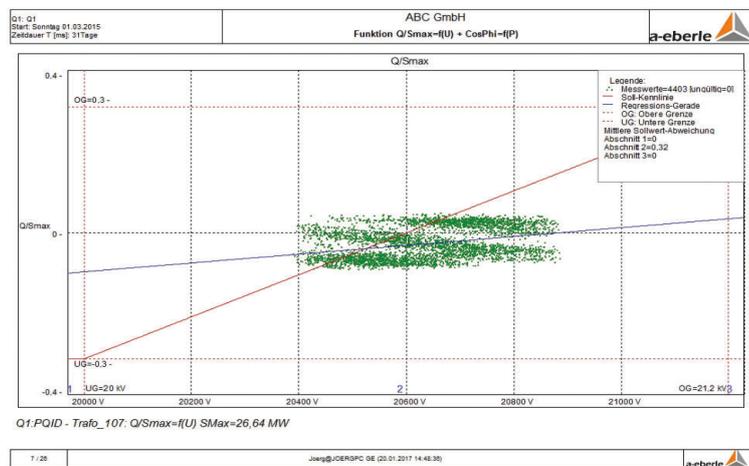


The 'Maps' option displays all of the stations on the map by their geographic coordinates. The maps are available offline. An internet connection is not needed.

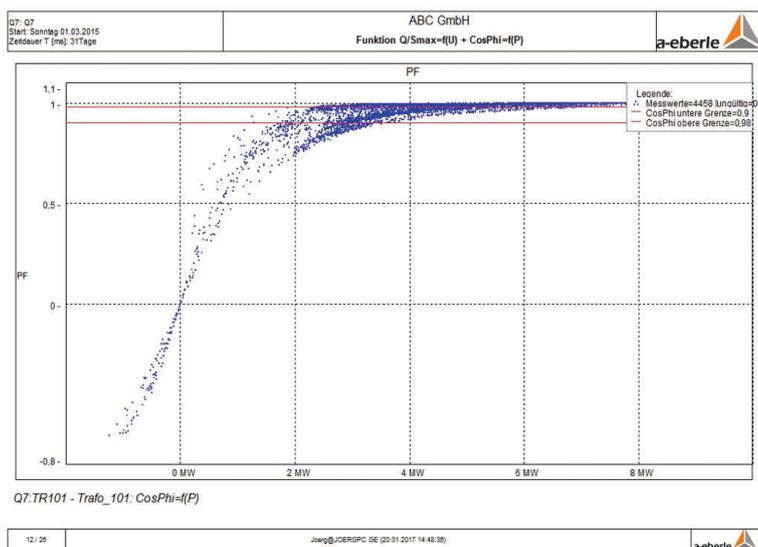


Many of the available measured values can be displayed graphically on the map as coloured bars. The graphics or charts can display the current voltage level, load flow and power quality reserves.

Power-generating systems / CosPhi characteristic for feeder



A target CosPhi can be required for power-generating systems based on the power that is fed-in or sourced. The 'CosPhi characteristic' option in WinPQ can be used to monitor this function and generate a report manually or automatically.



Device configuration

Adding new measuring points has never been so easy. A wizard walks the user through the setup for a new measuring device. All of the background processes needed to install the hardware are also configured automatically.

The software already has pre-defined templates for a high, medium and low-voltage grid, as well as for industrial grids.

The following standards are stored in the software and automatically updated by A. Eberle when necessary:

- EN50160
- IEC61000-2-2
- IEC61000-2-12
- IEC61000-2-4 Class 1, 2, 3
- D-A-CH-CZ Guideline

PQ-Gerät hinzufügen
Geräteauswahl

Bitte wählen Sie den Gerätetyp aus, der in Ihr WinPQ System hinzugefügt werden soll.

PowerQuality:

- PQI-DA smart
- PQI-D(A)
- PQ-Box (PQ-Box 100 / 150 / 200)

Netzdynamik:

- DMR-D
- DA-Box 2000

Zurück Weiter Ok Abbruch

PQ-Gerät hinzufügen
Bezeichnung auf der Gerätekachel

Bitte geben Sie die Bezeichnung ein, die auf der Gerätekachel Ihres PQ-Gerätes angezeigt werden

Gerätename (UW-Ost - SS1):
 UW Ost

Text 1:

Text 2:

Zurück Weiter Ok Abbruch

PQ-Gerät hinzufügen
Kommunikationseinstellung des PQI-DA smart

Bitte geben Sie die Netzwerkadresse Ihres PQI-DA smarts ein.
 Bitte beachten Sie, dass der Netzwerkport der zur Kommunikation benötigt wird, in Ihrem Netzwerk erreichbar sein muss.

IP-Adresse: Netzwerkport:

Zurück Weiter Ok Abbruch



Supported operating systems

- Windows 8 64 Bit*
- Windows 10 64 Bit
- Windows 11*
- Windows Server 2012 (R2)*
- Windows Server 2016 (R2)
- Windows Server 2019

*up to version 6.2

Supported database systems

- PostgreSQL > 14*
- MySQL V5.X (version is part of license key, see pricelist)
- Maria DB V5.X (version is part of license key, see pricelist)
- MSSQL (version 2012 - 2019) **
- ORACLE DB (12 - 19c)**

*PostgreSQL is supported with WinPQ > 6.2

**individual ordering process and licences keys are necessary!

Minimum system requirements

- CPU: 2 cores
- Memory: 8 GB RAM
- Storage: 20 GB for WinPQ installation and additional 1 GB per station per year (using standard profiles)
- Network: Ethernet adapter for communication with TCP/IP PQ devices
- Display: Remote desktop connection or display with minimum resolution of 1280 x 1024 pixels

Recommended system requirements

- Hardware: Server for 24h/365d or virtual system (cost effective)
- CPU: multicore CPU with 4 or more cores
- Memory: 8 GB RAM
- Storage: 20 GB for WinPQ installation and additional 1 GB per station per year (using standard profiles) with redundancy and automatic backup plan
- Network: Ethernet adapter with high bandwidth for communication with TCP/IP PQ devices
- Display: Remote desktop connection or display with high resolution (e.g. 1920x1200 pixels)

Required ports

Shares in gateways and firewalls have to be done from column to line (e.g. the release on the server with port 3306 has to be done by the WinPQ client to enable visualizations of measurement data on the client)

	WinPQ-Server	WinPQ-Client	PQI-D (REG-COM)	PQI-DA	PQI-DA smart
WinPQ-Server			8000 (TCP) Communication parameter settings	1023	5040 or 22
WinPQ-Client	3306 (SQL) 5432 (PostGRE) 1701...170X*				5040 or 22
PQI-D (REG-COM)					
PQI-DA					
PQI-DA smart					

*Depending on the application and needs the WinPQ Client requires exactly one port per connection to the measuring device PQI-D or PQI-DA. E.g. If two PQI-D's with REG-COM are connected to the WinPQ server via a connection with IP 192.168.100.102 via port 8000, a port e.g. 1701 is required by the WinPQ client.

User management / Security BDEW (IT Security)

User management is becoming increasingly important in medium and large enterprises. Each user can be assigned specific rights and groups. Pre-defined access permissions can be assigned through the rights. All users, passwords and rights are stored encrypted in a database.

Database maintenance and backup

A number of fully automated backup and maintenance mechanisms are available for operations running many devices. Automatic backups to external hard drives, deletion of repositories in the database after a certain time. Example: Ripple control records are stored in the database for only three months and then automatically deleted.

Adding external devices or components

If additional inputs are needed for temperature, light and messages, external devices can be added to the system solution through Modbus TCP/IP, enabling the system to be easily extended by a number of options.

Exporting measurement data

WinPQ offers the following export formats for the manual or automatic export of data:
PQDIF • COMTRADE • XML • TXT



WinPQ-software-versions

Characteristic	Code
<p>Operating software of the Power Quality system solution with the following basic functions:</p> <ul style="list-style-type: none"> Acquisition, analysis, visualization and archiving of measurement data, as well as automatic reporting Real-time monitoring of the system and parameterization of the measuring devices WinPQ Lite and PQParaExpress software for setup and parameterization of PQ measuring instruments PQI-DA smart, PQI-DE, as well as PQI-D and PQI-DA <p>Service contract: All updates and upgrades of WinPQ (not of the supplied database!) within 24 months from date of delivery are free of charge. (Connection service contract for further 24 months No. 900.9264)</p>	
Software WinPQ with PostgreSQL database	
Database and security: Postgree SQL database (maximum performance) with full support of IT security functions (encryption of the database connection)	
Software WinPQ with PostgreSQL: Workstation licence for <u>two</u> devices	900.9280.30
Software WinPQ with PostgreSQL: Workstation licence: till 10 devices	900.9271.30
Software WinPQ with PostgreSQL: Workstation licence > 10 and < 100 devices	900.9279.30
Software WinPQ with PostgreSQL: Workstation licence > 100 devices	900.9277.30
Software WinPQ with PostgreSQL: Company licence: The company licence includes the installation of two SQL-data bases on two different PC-servers. Any number of work places (clients) can be connected to each server and any number of devices linked; incl. unlimited service contract for the first year.	900.9288.30
Note: Licenses - device connections in the software incl. two Windows users for e.g. administrator and application user	
WinPQ software with freely selectable database	
Database and security:	
Use of a customer-supplied database (cf. supported databases in the system requirements - MSSQL / MYSQL v5 / ORACLE) (commissioning recommended, as connection via driver is necessary), IT security of the connections must be checked!	
WinPQ software with freely selectable database: Workstation licence for <u>two</u> devices	900.9280.20
WinPQ software with freely selectable database: Workstation licence: till 10 devices	900.9271.20
WinPQ software with freely selectable database: Workstation licence > 10 and < 100 devices	900.9279.20
WinPQ software with freely selectable database: Workstation licence > 100 devices	900.9277.20
Software WinPQ with freely selectable database: company licence: Includes installation of the application software on two different PC servers. On each server an arbitrary number of number of workstations (clients) may be installed on each server and any number of PQ devices may be connected to each server; Includes unlimited maintenance contract for the first year.	900.9288.20
Note: Licenses - device connections in the software incl. two Windows users for e.g. administrator and application user	
Additional workstations (clients)	
Extension of WinPQ by 3 additional application licenses (workstations or Windows users)	900.9065
Additional workstations: WinPQ extension from 2 to 10 devices	900.9072
Additional workstations: WinPQ extension from 2 to 100 devices	900.9063
Additional workstations: WinPQ extension from 10 to 100 devices	900.9068
Additional workstations: WinPQ extension from 100 to unlimited number of devices	900.9068.10
Additional workstations: WinPQ extension from 10 to company license	900.9069
Additional workstations: WinPQ extension from 100 to company license	900.9069.10
Additional workstations: WinPQ extension from > 100 to company license	900.9067
Addon packages (features) WinPQ:	
Addon packages: Renewable Generation (cos phi-line calculation)	900.9075
Addon packages: NEQAL: Export-Interface	900.9076
Addon packages: Report - Extended Version (Energy/Power/3D)	900.9078.01
Addon packages: COMTRADE-Data-Import (e.g. Evaluation of Siemens DFR's)	900.9078.03
Addon packages: Fault-dependent mail dispatch of fault recorders based on ITIC	900.9078.05
Map display - 2D and 3D (on DVD)	
Map display: Germany	900.9252.01
Map display: Austria	900.9252.02
Map display: Switzerland	900.9252.03
Map display: other	900.9252.99
Services for all WinPQ software packages	
Services for WinPQ: Extended service contract WinPQ for 24 months. Includes all updates and upgrades for WinPQ in the mentioned time slot (without mySQL).	900.9264
Services for WinPQ: Update mySQL-database (license)	900.9285
Services for WinPQ: WinPQ-calibration software for PQI-DA smart	900.9287



A. Eberle offers a variety of installed and mobile fault recorders and grid analyzers.