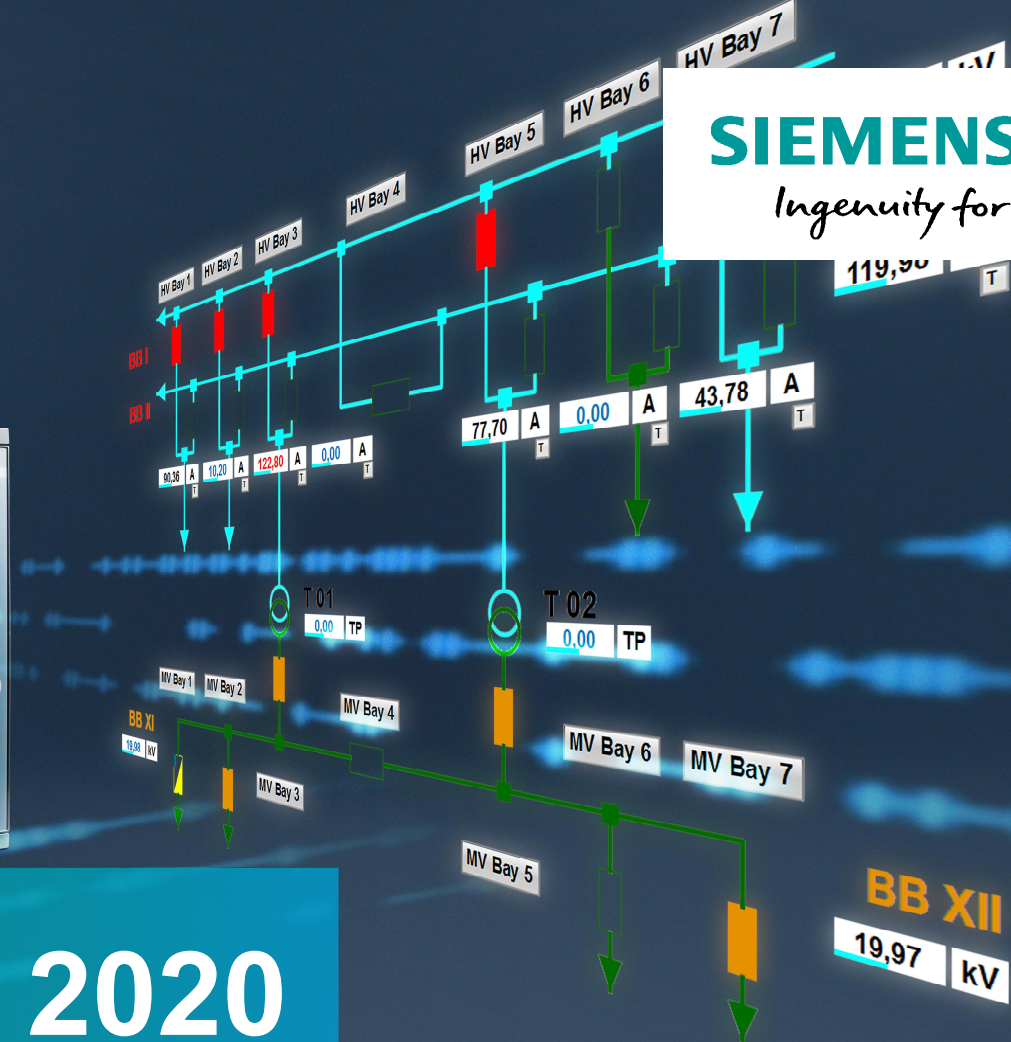


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Danish User Meeting 2020

Power Quality

Unrestricted © Siemens 2020

[siemens.com/powerquality](https://www.siemens.com/powerquality)

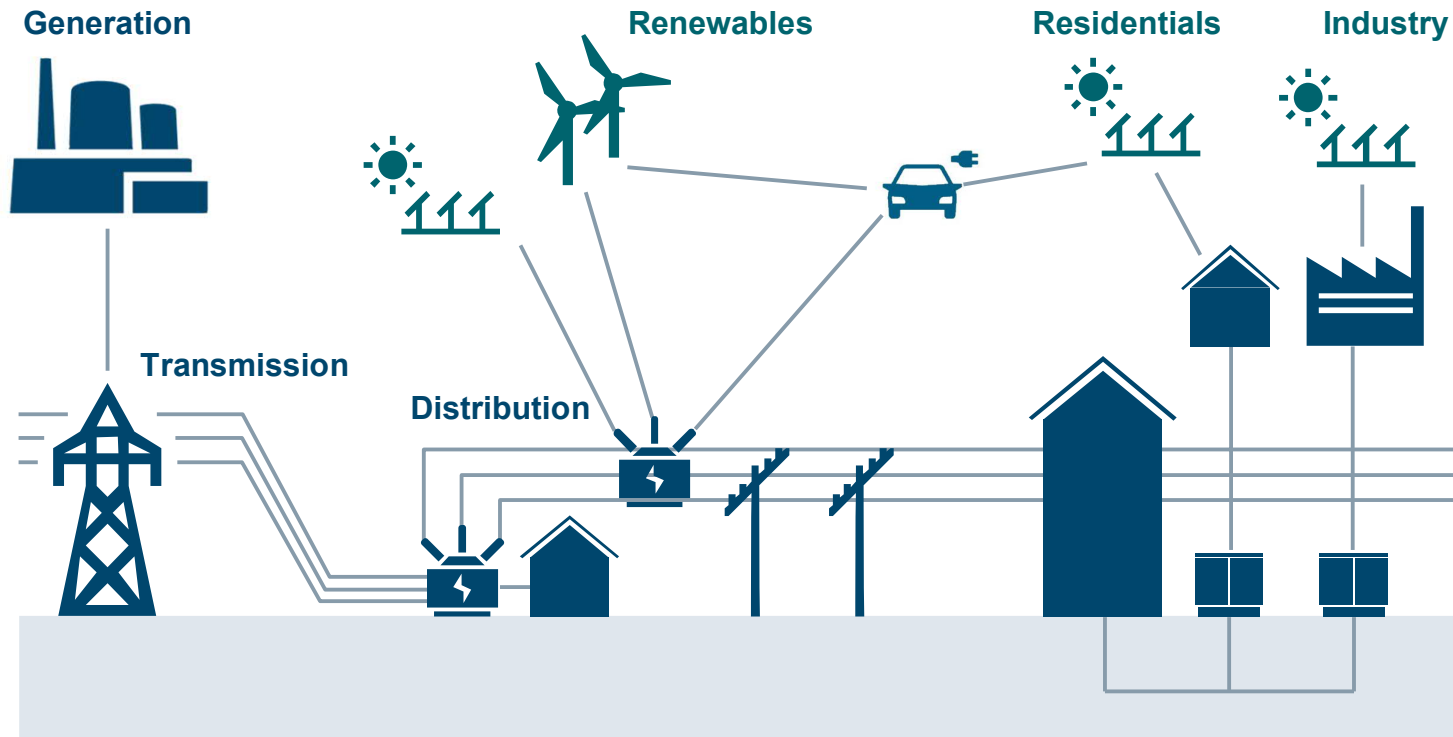
Power grid Yesterday



Producer & consumers

One way energy flow

Power grid Today



Producers & consumers
& prosumers

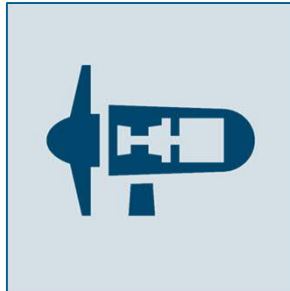
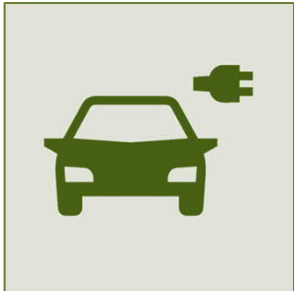
Distributed renewables

Why is power quality an issue?

Risks in the distribution system

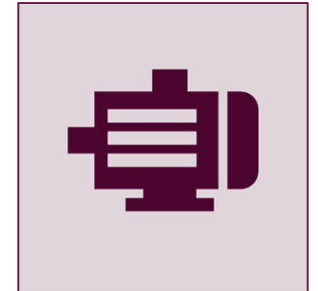
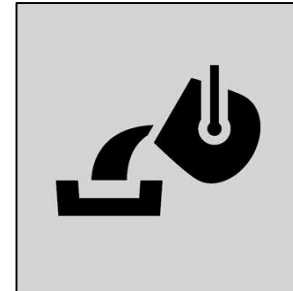
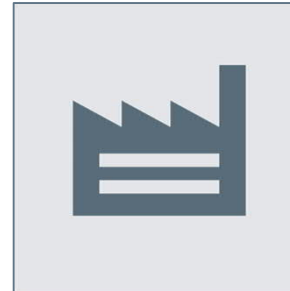
Renewable energies

- Increase in power electronics and inverters in electricity-supply System
 - Photovoltaic converter
 - Charging stations for electric vehicles
- Interference caused by electromagnetic disturbances
- Switching procedures at the energy supplier



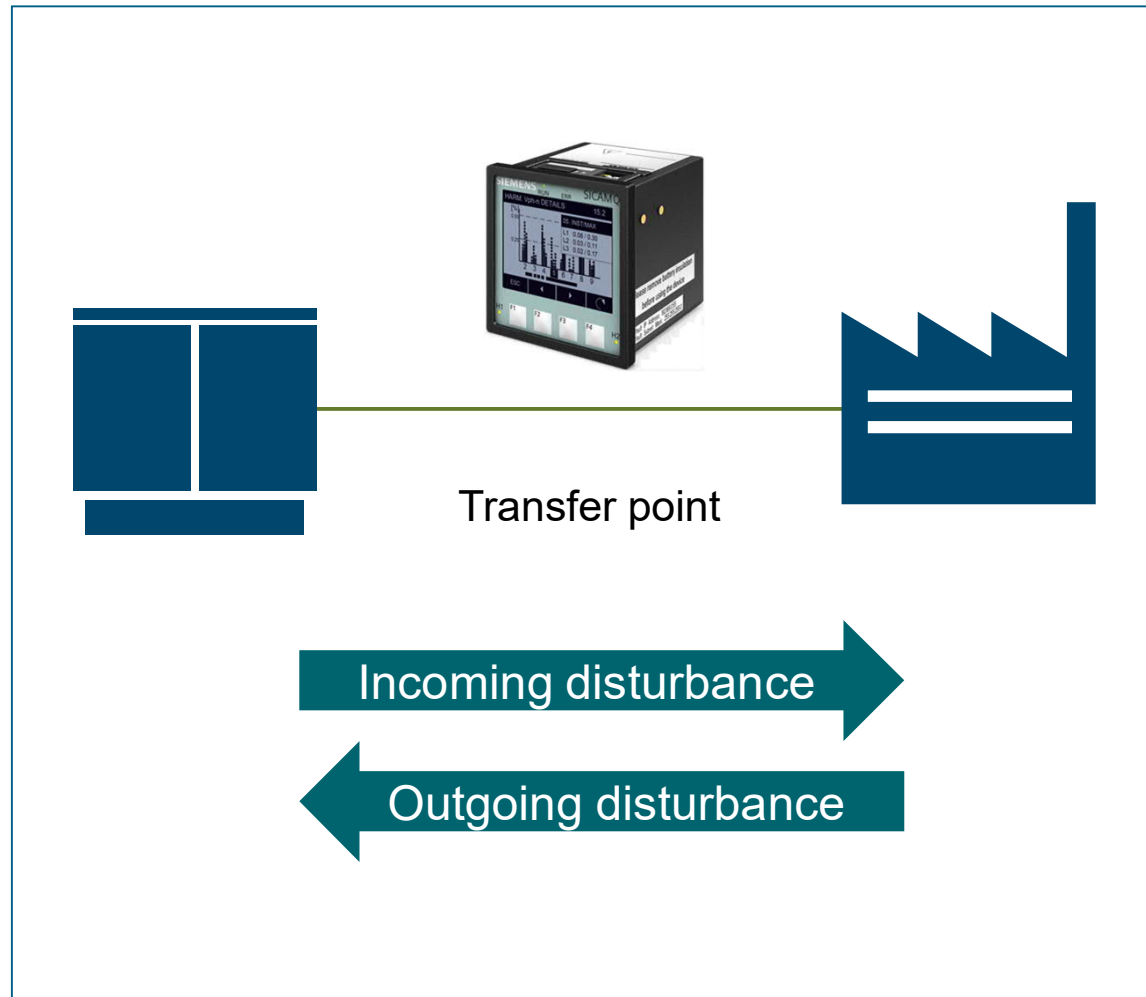
Power consumers

- Start-up of large loads such as electric motors, arc furnaces, welding equipment, elevators
- Switching semiconductor generated frequency emissions in the range of 2 kHz to 150 kHz



Reliability in industrial processes

Power quality as a competitive advantage



Monitor the shared point of connection (transfer point) between the customer and the power supply system.

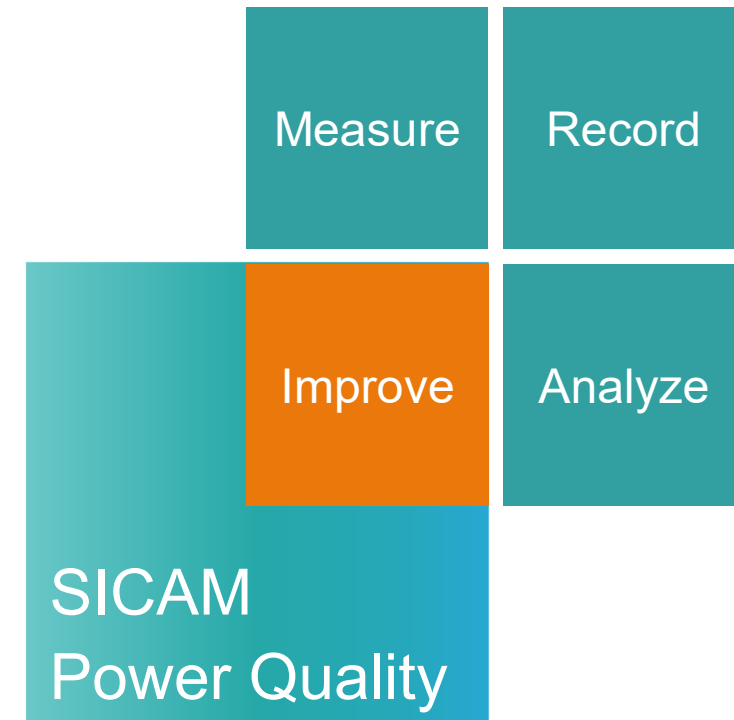
- Identification who causes the disturbance:
 - the energy supplier or
 - the energy consumer
- Seamless recording of power quality information
- Court usable compliance measurements
- Recording of energy management data

Stability creates reliability

Power quality in a new dimension

With the SICAM Power Quality Portfolio you can detect any disturbance of power quality

- SICAM power quality recorder **measure**, **record** and **analyze** the current voltage history
- **Analyzes** make the disturbances in your process visible and thus explainable
- Targeted countermeasures reduce the disturbances and the **improving** process
- This continuous loop of action increases the voltage quality and avoids unnecessary costs



SICAM Q100

All-in-1 solution for Power Quality and Energy Management



- Recording and processing according to IEC 61000-4-30, Class A
- Evaluation and reporting according to EN 50160
- Identifies cause of voltage events and harmonics - the energy supplier or the energy consumer
- Acquisition of electrical measurands for use in energy management systems.
- Accuracy class 0.2S
- Equipped with modern Cyber Security standards

Predestined for court usable compliance measurements. First choice for monitoring the power quality at each connection/transfer point.



Class A

SICAM Q200

The highly sensitive, all-around solution

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Covers all functions of SICAM Q100, plus:

- Detects high-frequency disturbances
- Supra-harmonics in the range of 2 – 150 kHz
- Extremely fast transients of up to 1 μ s / 6 kV
- Measurement accuracy class 0.1S according to the next edition of the IEC 62053-22 standard

Measurements in sensitive production environments, such as chip manufacturing or data centers.



Class A+

Detection of the fault direction

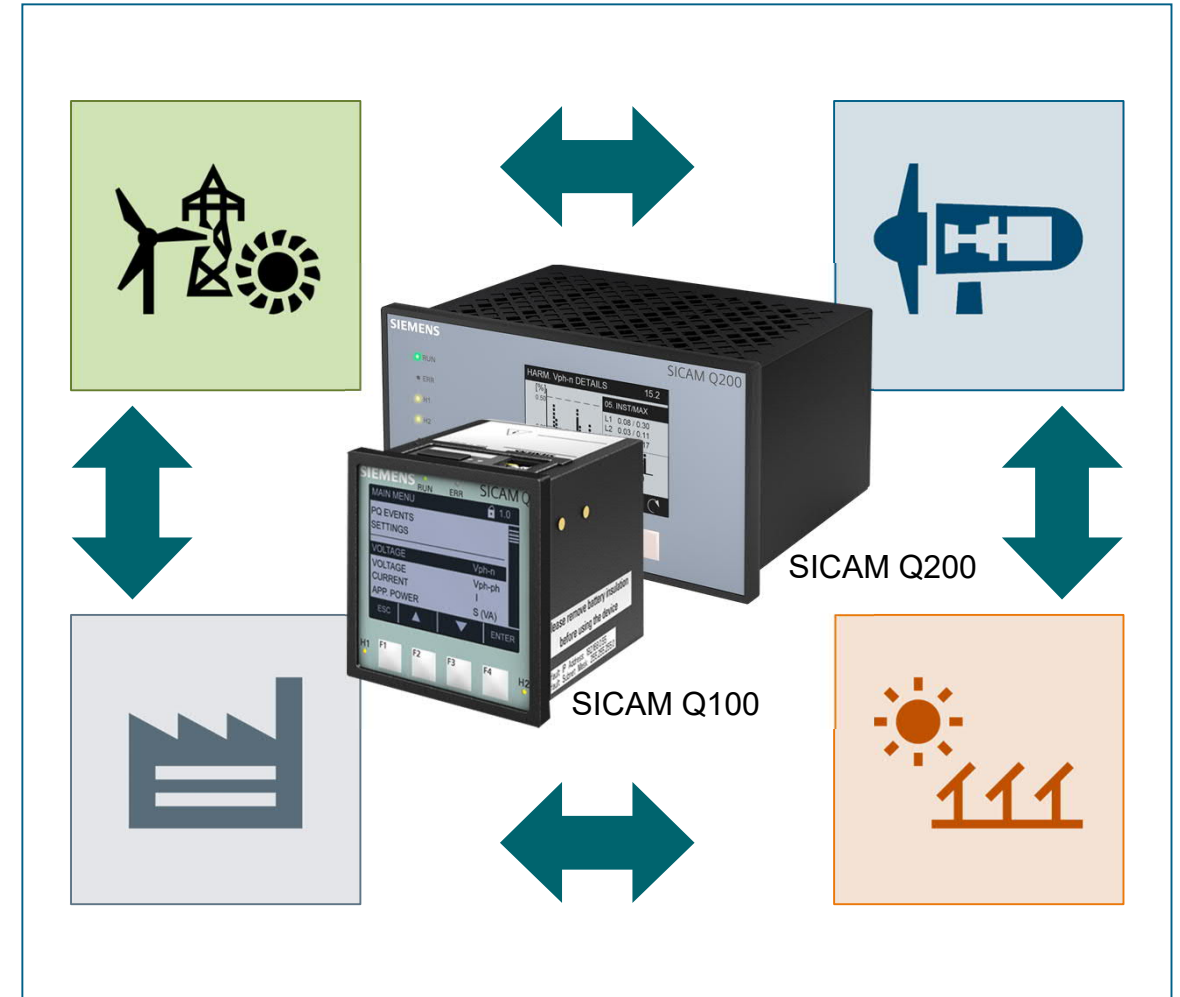
Harmonic phase angles according to IEC 61000-4-7

Power utilities

- Provides high voltage quality
- Ensure that consumers do not feed poor voltage quality into the grid (e.g. emissions of non-linear loads and renewable energies)

Power consumers

- Obtaining high voltage quality
- Avoidance of poor power quality being fed into the grid (e.g. caused by non-linear loads)



Stability creates reliability

Current standards in Power Quality

Measurement method:

- Defined accuracy: Class A, Class S
 - IEC 61000-4-30 (Measurement method)
 - IEC 61000-4-7 (Harmonic, Intra-harmonic)
 - IEC 61000-4-15 (Flicker measurement)



Product standard PQI:

- Defined functional test and uncertainty requirements
 - IEC 62586-1 (Product standard)
 - IEC 62586-2 (Functional test)



PQ evaluation:

- Defined measurements, processing and evaluation of characteristic curves
 - EN 50160 (Voltage regulation characteristic of the energy, supplied by power utilities)
 - IEC 62749 (Assessment of power quality)

Data exchange and communication standards:

- Defined communication protocol
 - IEC 61850-90-17
- Defined data formats:
 - IEEE 1159.3 PQDIF (Measurement data)
 - IEEE C37.111 COMTRADE (fault records)



Current
standards
in power
quality

Stability creates reliability

SICAM Power Quality – configuration & operation



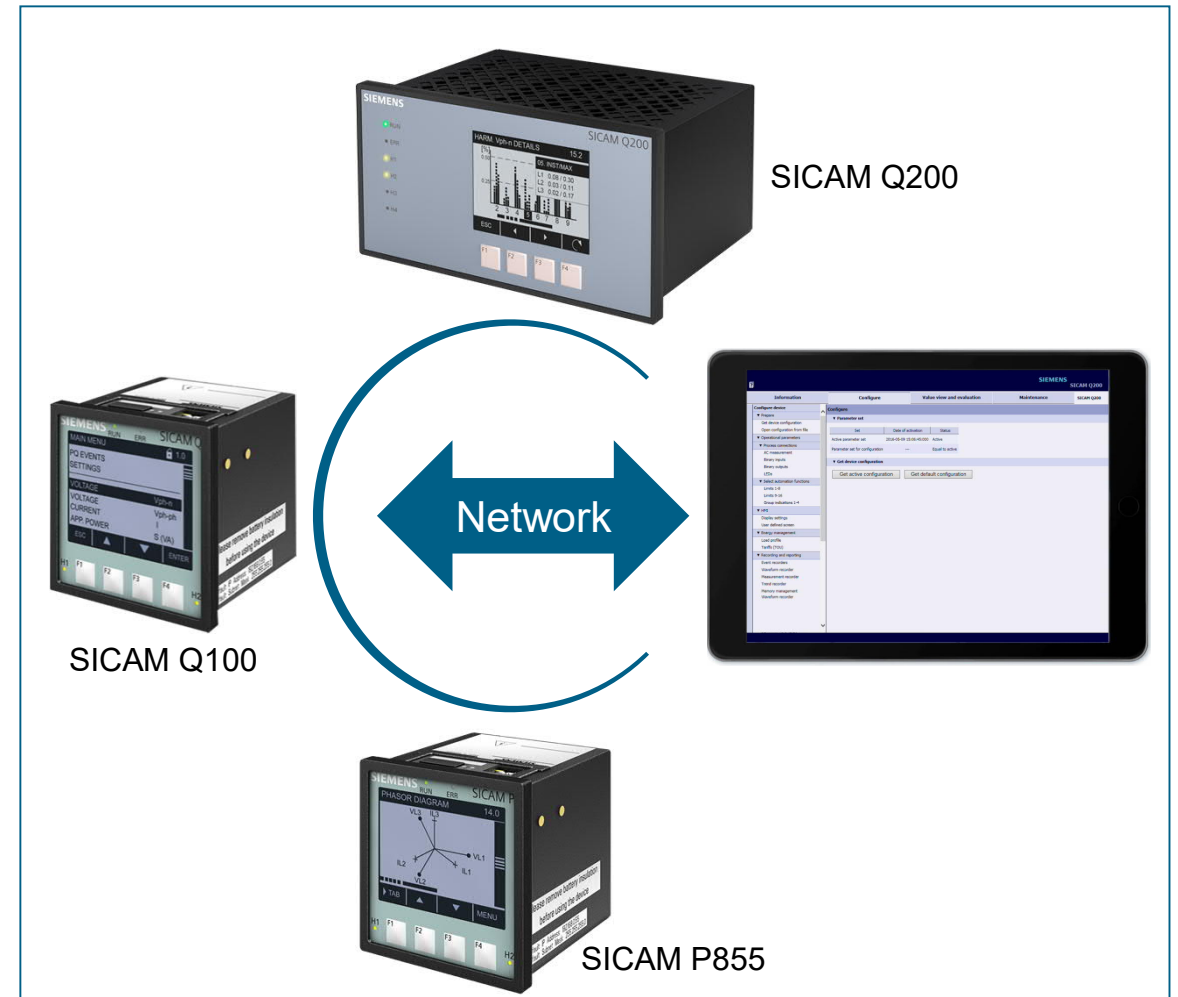
Communication

Communication with SICAM Power Quality devices without time-consuming installation of software

Evaluation

In conjunction with the COMTRADE Viewer and the SIGRA Plug-in for Internet Explorer, you can even view and evaluate events directly in the browser

All you need is a standard browser and a network connection.



Cyber Security

Meeting tomorrow's requirements - SICAM Q100/Q200



Role Based Access Control

RBAC ensures that users can only exercise the rights corresponding to the assigned role

SICAM Q100



Save and reliable [https](https://) protocol

Guarantees secure transfer of sensitive data

Firmware label

Security against firmware manipulation.
Only firmware marked by Siemens is loaded

Security log

Non-volatile recording of SYSLOG events



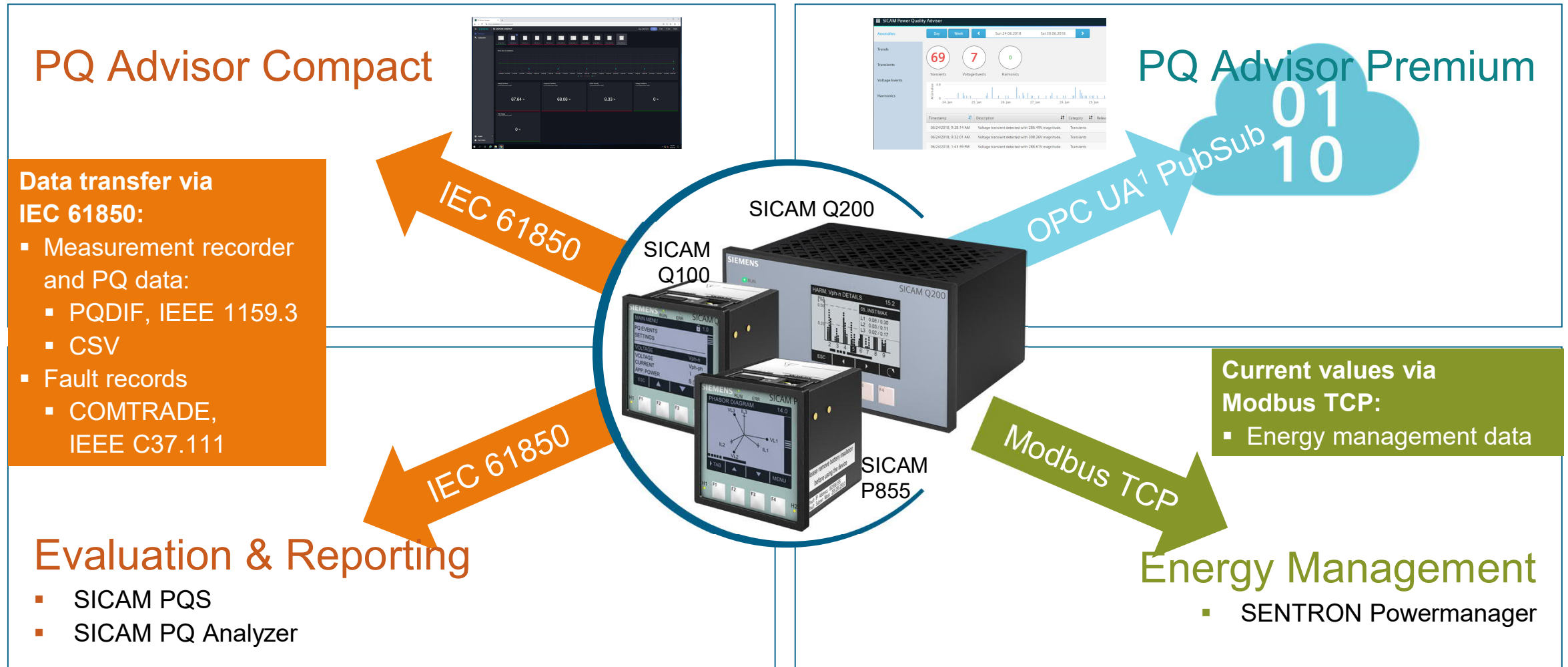
SICAM Q200



Connectivity, system integration & data transfer

Open and transparent - SICAM Power Quality

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SICAM Q100 and Q200

Integration with SENTRON powermanager



Completed offering

- SICAM Q100 and SICAM Q200 offer a steadily increasing number of power metering features.
 - Our customers can now benefit by integrating an extended range of devices, which support power metering features, with Powermanager.
 - For the integration you just need to install the respective .json files, which can be downloaded from SIOS.
- [.JSON file SICAM Q100](#)
 - [.JSON file SICAM Q200](#)

Handle Q100 / Q200 as SENTRON PAC devices



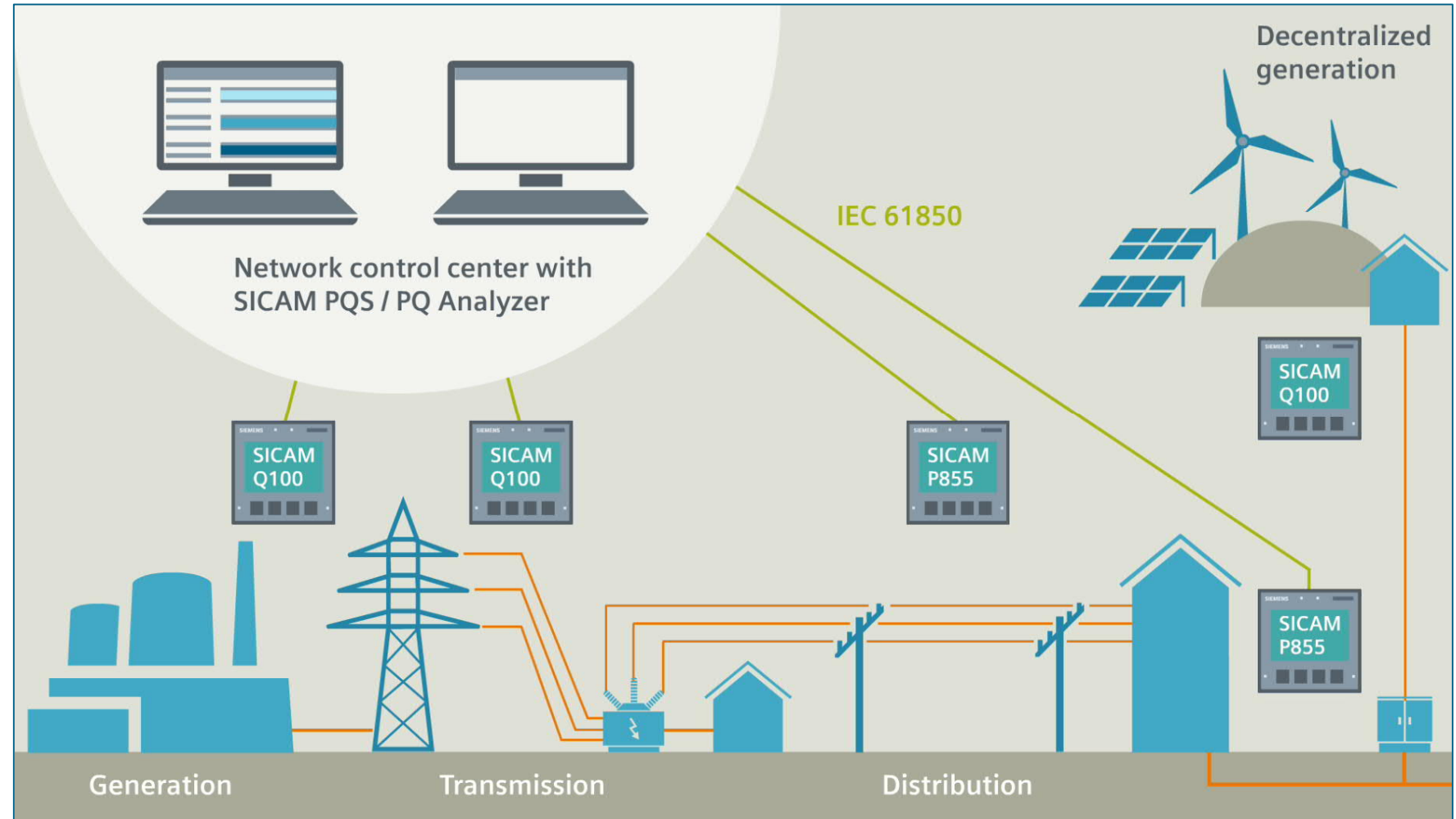
One tool for Siemens energy management

Great benefits for minimal investment

Along the entire energy chain - SICAM Power Quality

Optimum power quality can only be achieved if the entire energy chain is monitored:

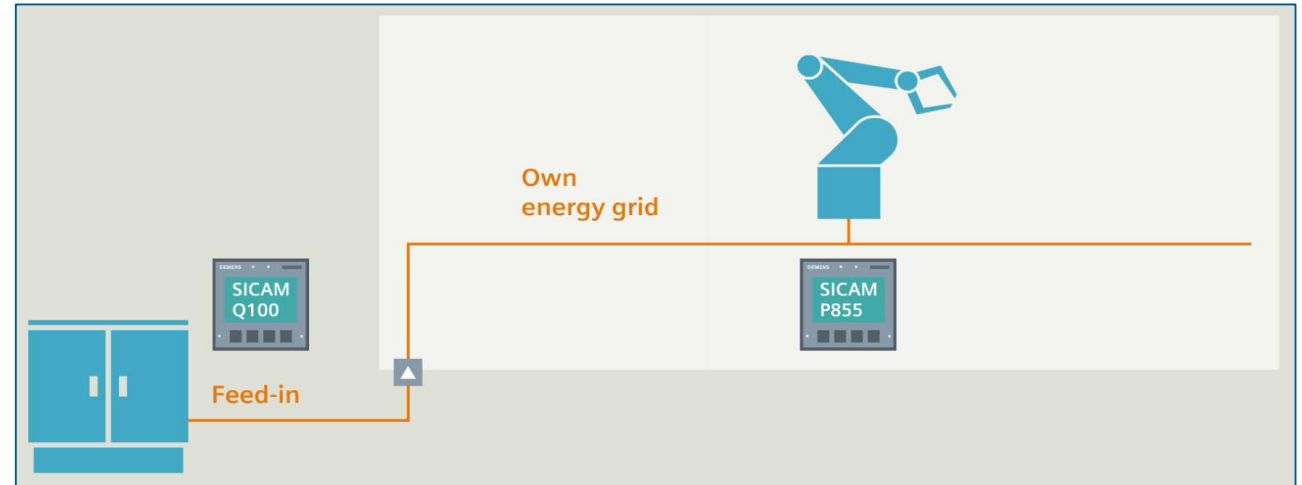
- Generation
- Transmission
- Distribution



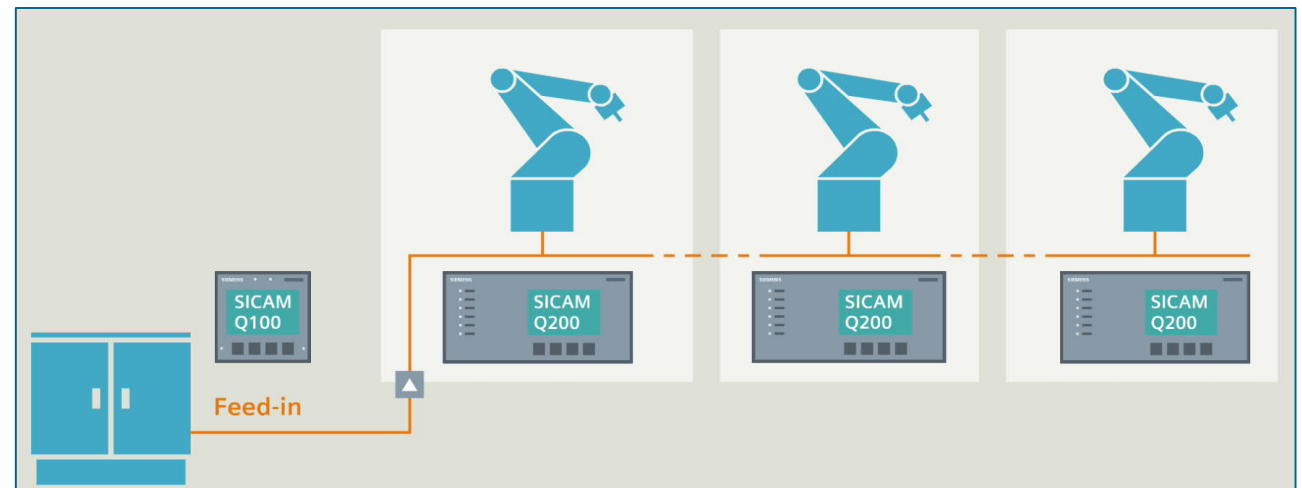
Great benefits for minimal investment

Power quality as a competitive advantage

In industrial processes, it's useful to monitor the shared point of connection (transfer point) between the customer and the electricity-supply system separately.



For sensitive processes, such as chip manufacturing, a SICAM Q200 is the better choice.
Captures extremely fast transients up to 1 μ s / 6 kV



PQ Advisor Compact - Definition

PQ Advisor Compact is a new software tool for central **monitoring** of the **power quality** in all areas of power supply

“Easiest way to monitor the power quality in your power system”

PQ Advisor Compact will give an answer to following questions:

- **What** happened **where** and **when**?
- Where is the source of the disturbance: **external** or **internal**?

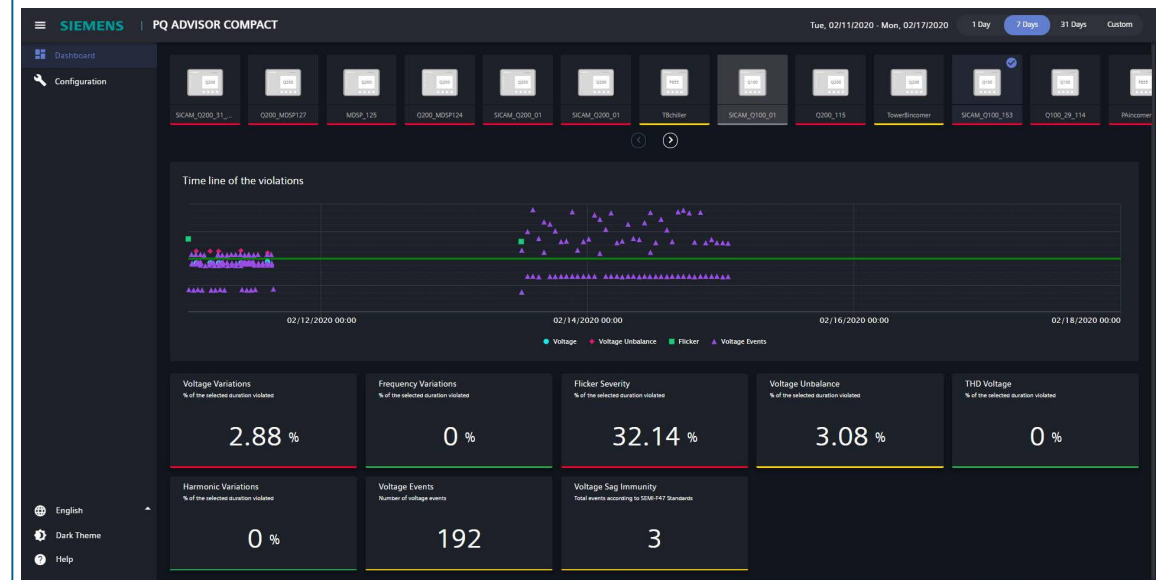
PQ Advisor Compact

The knowledgeable advisor



- User will learn **what** caused the malfunction, **when** it occurred and **where** it occurred: **externally** or **internally**
- Monitors all relevant operational values
- Grid Code evaluation according EN 50160
- Professional evaluation of your grid quality thanks to graphic processing of the data via a traffic light
- Automatically searches for SICAM power quality recorders in your network without any configuration
- Can be integrated into existing IT infrastructure (Windows)

Use the software even without expert know-how



Designed for use in small industrial plants, infrastructure and in municipal utilities.

PQ Advisor Compact

Voltage events

The ITI (CBEMA) Curve describes an AC input voltage envelope which typically can be tolerated, without interruption in function by most IT equipment.



SEMI F47 is an industry standard for voltage sag immunity. It describes the depths and durations of voltage sags, or dips which industrial equipment must tolerate.

Equipment that complies with SEMI F47 is more reliable, and more productive.



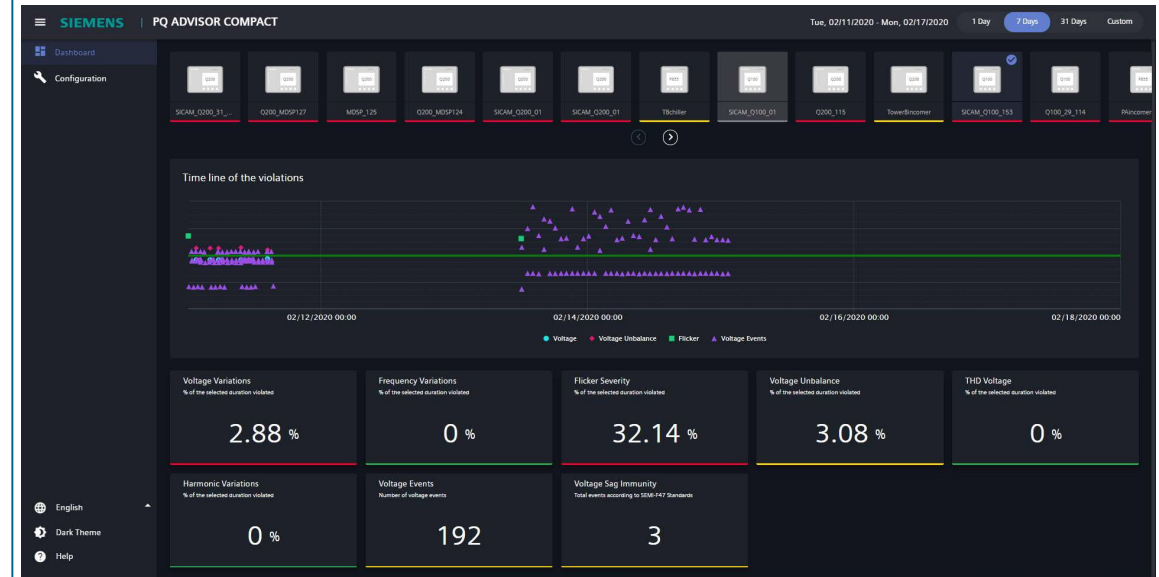
PQ Advisor Compact

Add-on module: reporting package (V1.30, planned 08/2020)



- Dashboard in report format
- One report per device
- Automated report per week
- Automated event report; specific for certain use cases (i.e. voltage dips)
- Manual report (from requested time)
- Notification service per email
- Violation report sent by email (just for the specific violation)

Report and notify



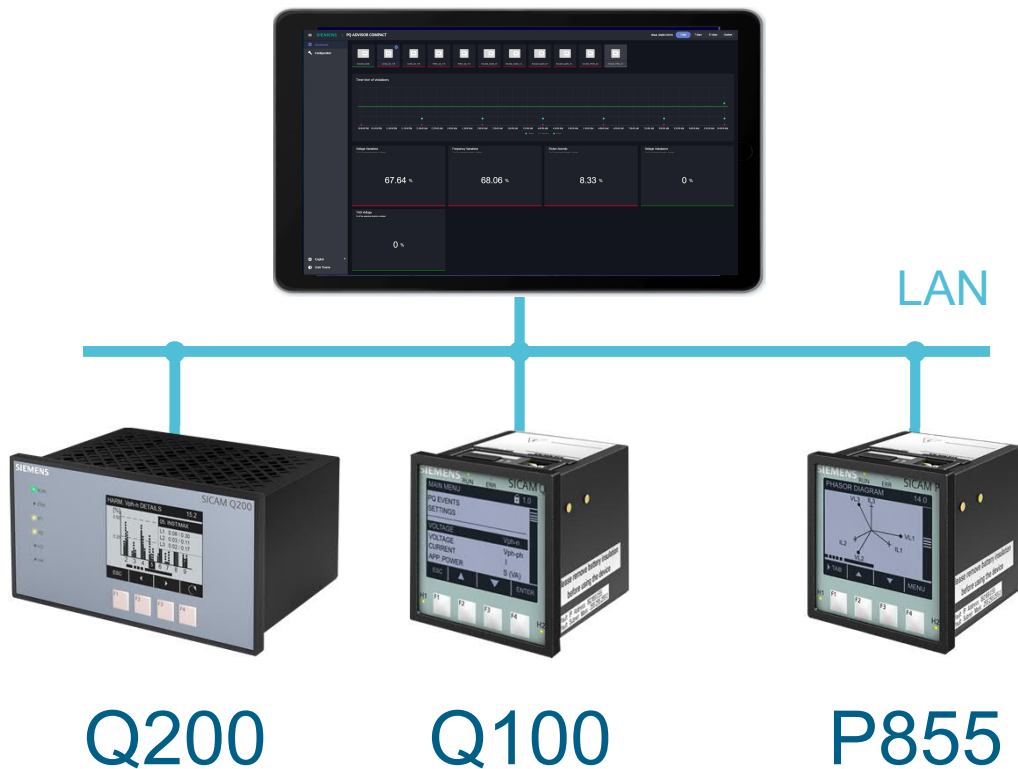
Dashboard in report format

PQ Advisor Compact

Integrated system solution



PQ Advisor Compact

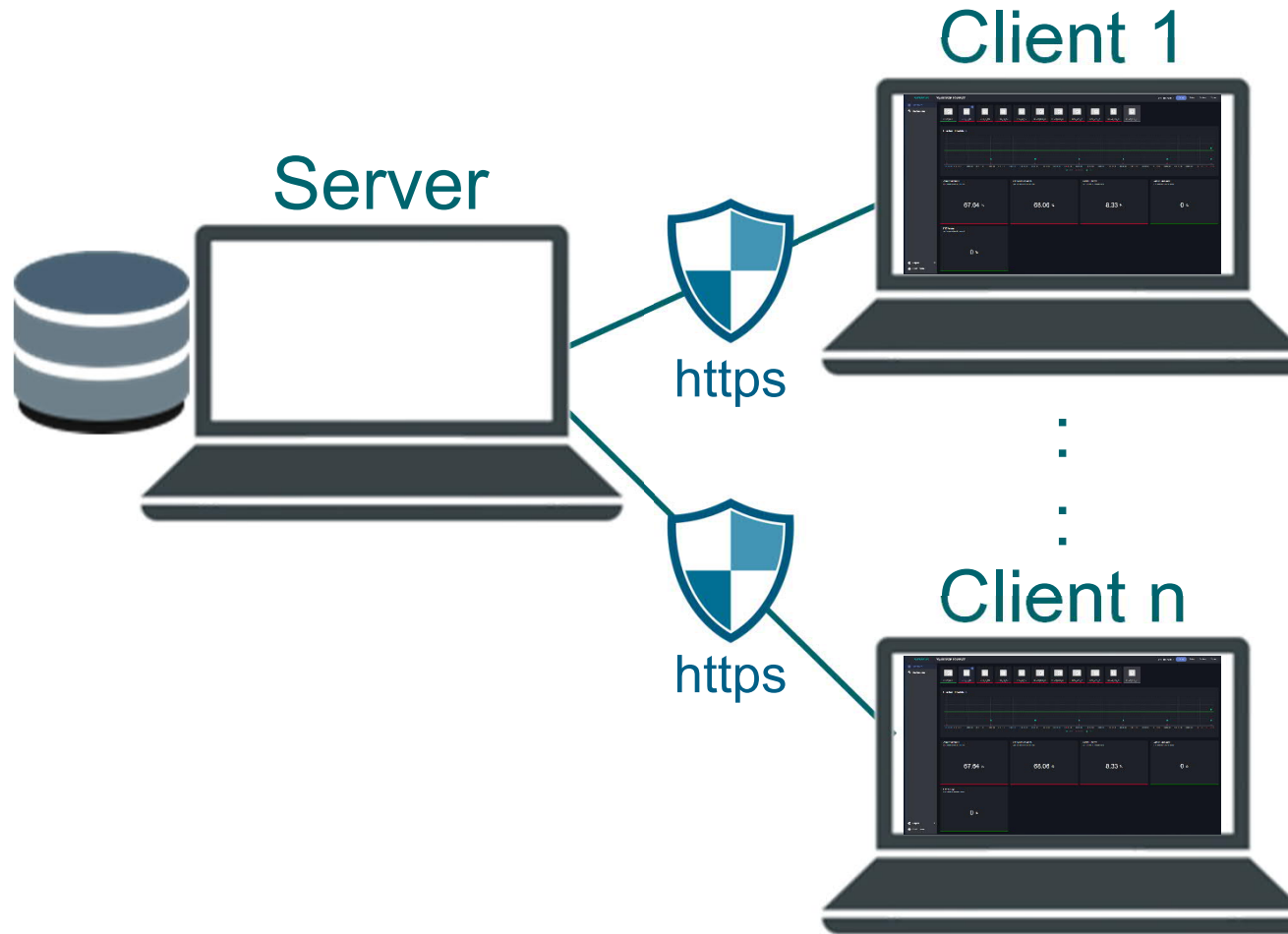


Automatic search of
SICAM PQIs in local electrical
power system

Automatic download of
PQDIF-files from connected
SICAM PQIs

PQ Advisor Compact

Secure monitoring



Secure communication via
https protocol between
server and clients

PQ Advisor Compact Summary



1.	New software	4.	Easy to use
2.	Focus on industry, infrastructure and smaller utilities	5.	Easy to get
3.	Fast status at a glance	6.	No high investments

“Easiest way to monitor the power quality in your power system”

Great benefits for minimal investment

SICAM Power Quality - measurably better



Published by Siemens AG

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