

POWERSIDE®

Uncover the Hidden Power Quality
Issues That Plague Operations

Meet PQube® 3

The ultra-precise power analyzer that pinpoints costly problems fast



Unseen Power Quality Problems Threaten Critical Electronics and Processes

Safeguard against downtime, failure and outages with real-time monitoring and measurement

As businesses increasingly rely on advanced, sensitive electronics in their operations, **the significance of power quality issues is escalating.** Non-linear loads from new technologies are known to distort power supply currents in ways that severely impact connected equipment. **Consequences range from minor inconveniences to costly — and potentially dangerous — performance behaviors.**

What does poor power quality look like?

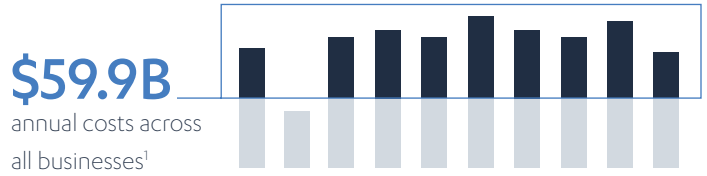
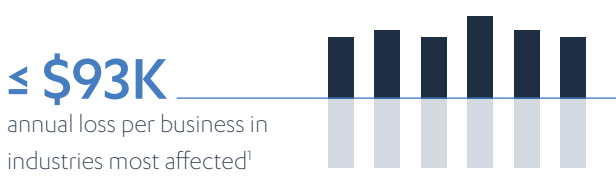
Warning signs:

- Lighting flickers
- Tripped breakers
- Harmonic distortions
- Circuit board failure
- Voltage dips and swells

Operations impacts:

- Equipment damage and failure
- High utility bills and power factor penalties
- Fire, electrical shock and other safety hazards
- Noncompliance with electrical and industry operating standards (e.g., IEEE, NEC, SEMI)
- Outages, downtime and lost productivity

The repercussions of power quality events contribute to staggering economic loss:



Power quality data analysis is the first step to ensuring 24/7 reliability, uptime and compliance in mission-critical industries, including:

Utilities



POWERSIDE®

EV Charging



Data Centers



Manufacturing



Medical



Meet PQube® 3 | 2

Industries on both sides of the meter suffer from suboptimal power.

Prevention starts with PQube[®] 3.

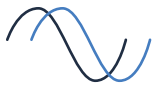
PQube[®] 3 delivers the powerful **power quality monitoring you need for proactive, data-driven analysis**. Get 24/7 visibility into the power that runs through your business' systems and components — **all in real-time, remotely and with clear data visualization**. Ensure the electrical power flowing through your equipment is stable and clean, and pinpoint exactly when and where it's not.



Reveal hidden power problems that lurk beneath the surface

There are many different types of power disturbances. **PQube® 3 reads and records them all.**

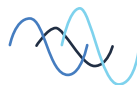
Take a closer look at the different issues that affect reliable power supply.



Power Factor

Description: Phase offset between voltage and current » reactive power

Cause: Inductive or capacitive loads (e.g., motors)



Voltage Variation

Description: Includes dips, sags, swells, brown-outs

Cause: Network faults and overload, capacitive load switching



Harmonics

Description: Multiples of the supply frequency

Cause: Non-linear loads (e.g., power converters, VSDs)



Unbalance

Description: i) Different network voltages
ii) Different load phase currents

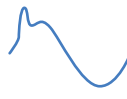
Cause: Mismatched single-phase loads (e.g., IT) and unbalanced three-phase loads (e.g., welding)



Resonance

Description: Energy storage / voltage growth at a natural frequency

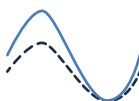
Cause: Matched capacitive and inductive impedance close to fundamental or harmonic frequencies (e.g., unplanned growth)



Flicker

Description: Random or repetitive voltage variation

Cause: High frequency loads: arc furnaces, welding, materials processing



Transients

Description: Abrupt voltage or current disturbances

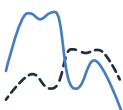
Cause: Switching large loads, lightning, arcing



Conducted Emission

Description: Interference or noise in the electric current/voltage

Cause: Switching events of an electronic device's internal frequencies



Supraharmonics







Description: High-frequency emissions in the 2–150 kHz range

Cause: Non-linear loads (e.g., EV chargers, distributed energy resources)

Power outages cause a **76% decrease in productivity** across commercial and industrial businesses.²

Physical environments can impact power quality, too

It's not just internal electrical disturbances that impact power quality. External concerns can also result in anomalies. **PQube® 3** records a variety of environmental inputs, including:

- | | |
|---|---|
|  Ambient temperature |  Shock |
|  Humidity |  Vibration |
|  Barometric pressure |  3-Axis acceleration |

Install anywhere with precision and ease

With its small size and flexible installation options, the PQube 3 is ready to plug and play. Simply mount and wire. **PQube 3 will take it from there with lightning-fast auto detection and configuration.**

- Snap-on din rail
- Existing din-rail enclosure
- Rugged pole-mount
- Rugged wall-mount
- Rack-mount
- Portable

Pair PQube® 3 with QubeScan for Fleetwide Data Analysis

Monitor your entire fleet of PQube® 3 power analyzers in one complete, connected platform. QubeScan monitoring software brings together data from all your PQube 3s for a seamless view of power quality across your enterprise. Create custom reports. Record trends and patterns. Share findings with key stakeholders with the ease of an email. It's never been easier to make power quality insights clear and actionable.

A united front that helps you defend against risk

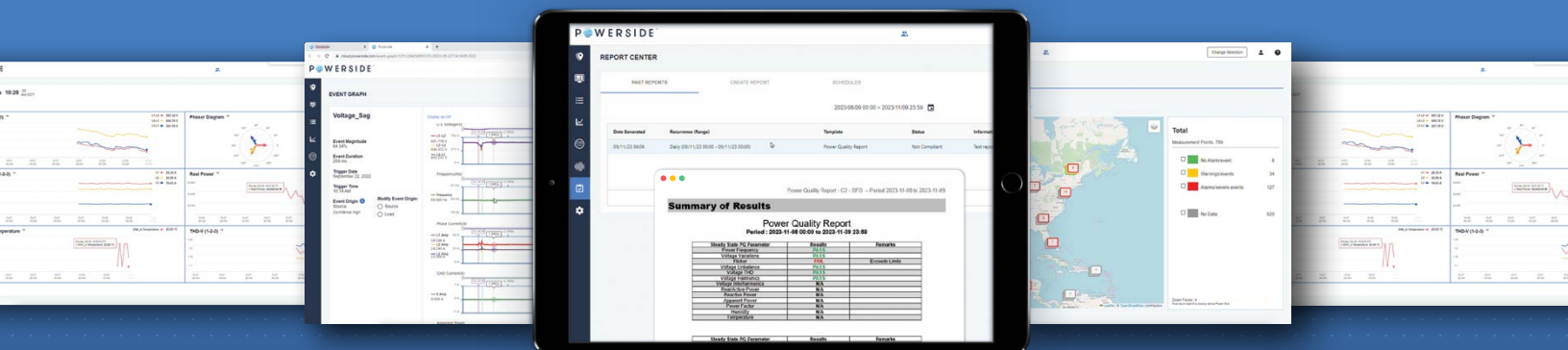
PQube 3

- **Alerts you** to voltage dips, spikes and surges that can damage equipment and systems
- **No software** to install. Emails graphs, Excel, PQDIF files directly to requested users.
- **Confirms the origin** of malfunctions and power problems to minimize rabbit-hole troubleshooting
- **Avoids unnecessary service calls**, equipment replacement and warranty claims
- **Continuously measures** voltage, frequency, waveform characteristics and up to 14 current channels, all in real-time



QubeScan

- **Reveals immediate, fleetwide visibility** into comprehensive quality data from all Powerside analyzers — including PQ Edge® and PQube 3
- **Captures accurate logging** of all events via keynotes
- **Produces interactive views** of event-recorded waveforms, high-frequency emission heatmaps, multi-circuit energy dashboards and more
- **Runs on a secure AWS cloud platform**
- **Records parameter trends**, from minutes to years of data
- **Displays configurable live meters** that can be customized to parameters that interest a specific user or audience



There's a PQube® 3 for Every Application & Scenario

PQube® 3

The market's only single-instrument, complete solution for monitoring power quality, environmental and process data.



PQube 3e

Multi-load monitoring capabilities do the work of 4 traditional revenue-grade meters.

PQube 3 Portable

A rugged design ideal for quick installation in small areas and **challenging environments**.



PQube 3v

Precise monitoring at the point of common coupling helps keep tabs on 24/7 voltage quality compliance.

PQube 3r

Ultra-precise, with the extended I/O interface and communication you need to protect **sensitive equipment**.



PQube 3LV

Easy interfacing with MV sensors or LV output signals make it perfect for **power grid and substation monitoring**.

Expose Dirty Power and Amplify Operations

Reach out to us with your equipment performance concerns — and request a PQube® 3 + QubeScan demo today.

powerside.com/PQube-3-power-analyzers

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¹Electric Power Research Institute (EPRI), Societal Costs of Power Quality Disturbances, July 2022.

²EEOnline, "Discovering the Truth About C&I Power Reliability," republished from July/August 2018 issue.



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