

# Overview of Dranetz Technologies and Electrotek Concepts

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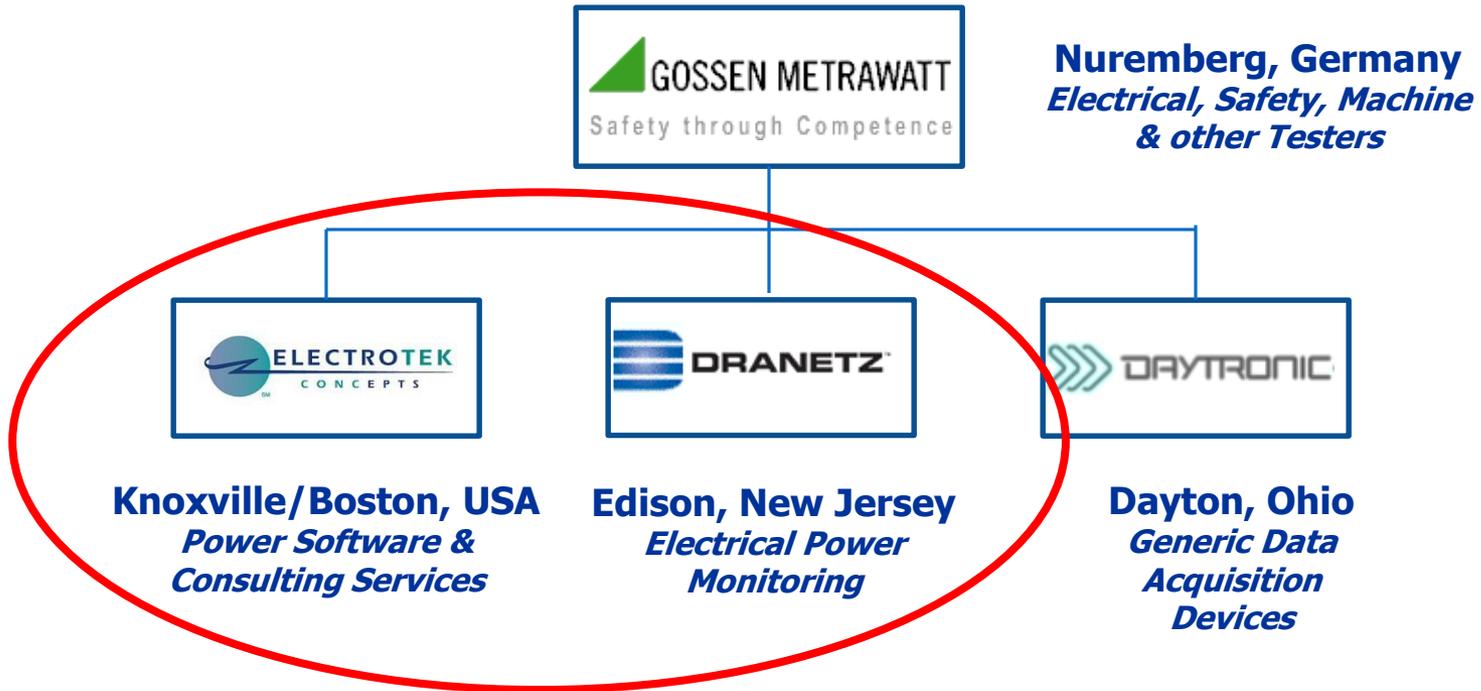
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PQSynergy 2016  
Bangkok, Thailand



# Corporate Organization



# Electrotek and Dranetz Office Locations





## Dranetz Technologies

- Founded in 1962 by Abraham Dranetz
- Headquarters in Edison, New Jersey, USA
- Manufacturer of Portable, Semi-Permanent and Permanent Power Monitoring Instrumentation
- Products Manufactured in USA, but Used around the World

# Dranetz Products



## DRANETZ HDPO

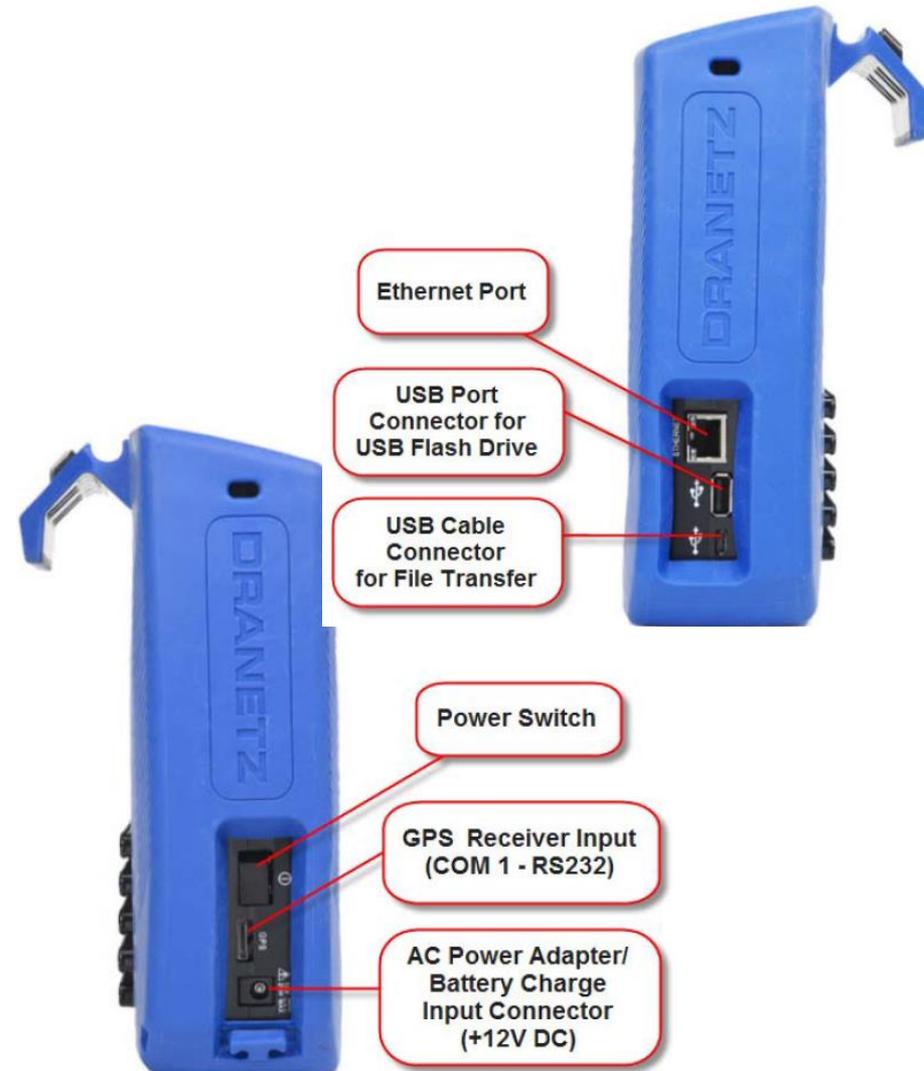


**ENCORE™**  
S E R I E S



## Portable Dranetz Monitors: Superior Communications

- 10/100 Ethernet via RJ45
- 802.11 Built in Wireless
  - Standard on Xplorer, Guide
  - Not available on Visa
- Bluetooth - External via USB
  - Standard on Xplorer, Guide
  - Optional on Visa
- USB On The Go – 2 ports
  - Full size (master) for memory stick, Bluetooth
  - Micro for Plug & Play with a computer
- External GPS receiver/antenna for Time Synchronization



# Overview of Encore Series

- Web-Browser Based Continuous Monitoring System
  - Power Quality Monitoring
  - Reliability-Based Monitoring
  - Energy Management
  - Process and Production Management
- Open Architecture via Web Technologies
- Automated Answer Modules

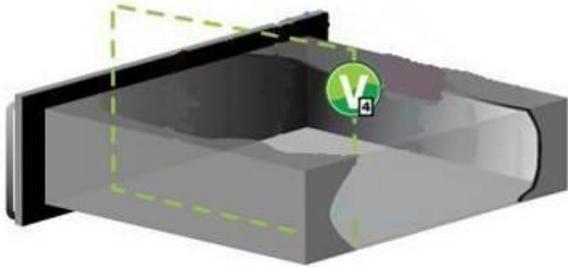


# Intelligence via Optional Answer Modules

- Advanced analysis and characterization of data with intelligent algorithms that interpret and/or characterize data
- **Voltage Sag/Dip Directivity:** Did the sag originate upstream or downstream?
- **Power Factor Capacitor Transient Analysis:** Was the source of the transient a PF capacitor switching? Identifies unbalanced capacitor switching
- **Uninterruptible Power Supply Analysis:** Pass/Fail report that compares data from the input/output of the UPS to determine if the UPS is mitigating input side problems.
- **Energy Usage:** Advanced energy analysis and aggregation
- **One-Line:** Custom web-based interactive graphical user interface with real-time updates, event lists, and data logs
- **ESS-OPC:** Share real-time values using OPC-DA

# Build Your Own Instrument!

## Voltage Compliance



4 Channel Voltage Module

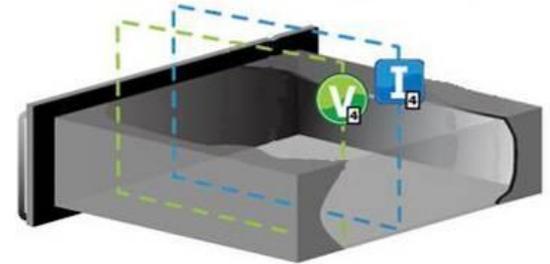


4 Channel Current Module

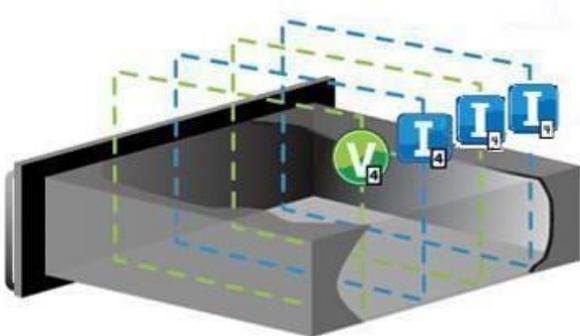


Digital Input Module

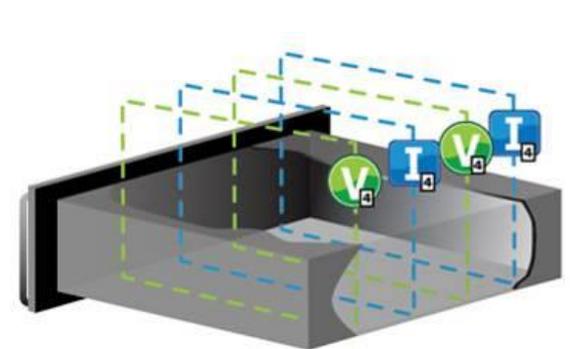
## Std Power Quality



## Substation Feeder



## UPS Performance



## Dranetz in Asia

- Regional Manager for Asia, Australia, and New Zealand
  - PQ Thailand
- Regional Support Center with PQ Thailand
  - Sales Support
  - Technical Support
  - Repair
  - Inventory



# Partial Customer List

## Electric Utilities

AGDER ENERGI NETT AS – Norway  
 Allegheny Power  
 Alliant Energy  
 American Electric Power  
 BKK NETT AS – Norway  
 Bonneville Electric  
 Central Electric Company  
 Central Networks – UK  
 Central Service Power of San Antonio  
 City of Danville, VA  
 City of Lakeland  
 City of Palo Alto  
 City of Tucson  
 CITY UTILITIES OF SPRINGFIELD  
 CMS Energy  
 Commonwealth Edison  
 Companhia de Electricidade, Macau  
 Consolidated Edison  
 Dayton Power & Light  
 Duke Energy  
 ELECTROBISTAND - Norway  
 Elektro Primorska, Slovenia  
 ELES - Elektrogospodarstvo Slovenije  
 Entergy  
 EPRI-PEAC  
 HALOGALAND KRAFT AS - Norway  
 Hawaii Electric  
 HELGELANDSKRAFT AS - Norway  
 HEP Transmission Company, Croatia  
 HEP Distribution Company, Croatia  
 HYDRO ALUMINIUM – Norway  
 ISTD NETT AS  
 Guangdong EPRI, China  
 JiangSu EPRI, China  
 Kansas City Board of Public Utilities  
 Keyspan  
 Knoxville Utility Board  
 KOREA INSTITUTE OF ENERGY RES  
 LYSE NETT AS  
 Maui Electric  
 Mid American Energy  
 Morristown Power System  
 National Grid, UK

Nebraska Public Power  
 NORDMORE ENERGIVERK AS – Norway  
 Northeast Utilities  
 NOTODDEN ENERGY AS - Norway  
 New York State Electric and Gas  
 Oklahoma Gas & Electric  
 Omaha Public Power Dept.  
 Pennsylvania Power And Light Electric Utilities Corp  
 Polskie Sieci Elektroenergetyczne SA, Poland  
 Public Service of Oklahoma  
 Reliant Energy  
 ROYOY-LUROY KRAFTVERKAS - Norway  
 San Diego Gas & Electric  
 Shanghai Municipal Electric Power Company, China  
 SFE NETT AS  
 Shanghai Metro Traffic Co, China  
 Shanxi EPRI, China  
 SINTEF –Norway  
 SKAGRAK NETT AS – Norway  
 Southern California Edison  
 Sunnfjord Energi A/S/ Norway  
 STATNETT – Norway  
 SWECO GRONER AS – Norway  
 TAFJOR KRAFTNETT AS - Norway  
 Texas Utilities  
 Tennessee Valley Authority  
 TUSSA NETT AS - Norway  
 United Illuminating  
 Unity Electric Corporation

## Government

Aberdeen Proving Ground  
 Argonne National Laboratories  
 Arup Laboratories  
 Federal Aviation Administration  
 Government communications Headquarters, UK  
 Internal Revenue Service  
 International Broadcasting Bureau  
 Lockheed Martin  
 London Air Traffic Control, UK  
 MI-5 - UK  
 NASA Ames  
 National Institute of Standards  
 National Renewable Energy  
 Laboratory  
 North Wales Police, UK  
 Onizuka Air Force Base  
 Raytheon  
 US Air Force/Lockheed Martin  
 US Army  
 US Navy  
 The World Bank  
 McCarran International Airport

## Original Equipment Manufacturing/Partners

BAE Systems  
 Beacon Power Corporation  
 Socomec - France  
 Fuel Cell Energy  
 Soft Switching Technologies  
 Pillar  
 Toshiba  
 S&C Electric  
 UTC Fuel Cells

PON CAT AB(Caterpillar)  
 - Sweden

# Partial Customer List

## Finance/Banking

Alliance & Leicester Bank, UK  
 American Express  
 AmSouth Bank  
 Bank of America, UK  
 Banco de Peru  
 Banco Popular  
 Bear Stearns  
 Bloomberg, UK  
 Chicago Stock Exchange  
 Citicorp  
 Credit Suisse, UK  
 Deutsche Bank  
 Federal Reserve Bank  
 Goldman Sachs  
 HBC Bank UK  
 JP Morgan/Chase  
 KPMG  
 Morgan Stanley  
 NASDAQ  
 New York Stock Exchange  
 Nomura Securities  
 NYCE  
 The World Bank  
 Visa

## Education

University of North Carolina  
 UCLA Medical

## Commercial & Industrial

ABC Network AK Steel Akzo Nobel American Physical Society Asltom Boeing Calvin College CBS Networks CHARLES SCHWAB & CO CPI Dade Behring Delta Airlines DHL Airways Discovery Communications Dupont Dyna Electric Electrical Systems Intl Eli Lilly Elgar Sorenson Emerson, China Epsilon Fresh Direct Georgia Pacific Golden Era Prod. Hamilton Sundstrand Hearth & Home Intel Johnson & Johnson LOGAN ALUMINUM Mead Westvaco MEM Switchgear McCarren Airport Metropolitan Council Millennium Chemical	Minnesota Corn Products Murphy Oil Mystic Lake Casino Niagara Water Nucor Steel Ohio Aerospace Pfizer Pharmaceutical, UK Phillip Morris Powell-ESCO Reuters, UK Renault, Slovenia SANDVIK COROMAT – Sweden Safeway Sharp Electronics Shell Oil Sintef Skyguide, Switzerland Statoil Texaco, UK Texas Petrochemical TLT Babcock United Airlines Welsh Traffic, UK
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## Computer/Information/Telco

Cingular/AT&T Wireless  
 Cisco Systems Q Logic  
 Computer Sciences  
 Control Systems Intl  
 Dow Jones  
 Extreme Networks  
 GC Micro  
 Harris Corp  
 IBM  
 Motorola  
 Next Level Comm  
 Pac Bell  
 SIAC  
 Sun Microsystems  
 Sutro Towers  
 Telehouse Int'l  
 Texas Instruments  
 Unisys  
 Verizon

## Hospital/Healthcare

City of Hope  
 Kaiser Permanente Hospital  
 MD Anderson Medical Center  
 Presbyterian Health Care  
 City of Hope  
 Kaiser Permanente Hospital  
 MD Anderson Medical Center  
 Presbyterian Health Care

# What is New?

- HDPQ Firmware Updated to Version 1.3.11
- Dran-View Updated to Version 7.2.07
- DataNode 5530
  - Current Waveform Change Events
- Encore Series Updated to 5.4.11
  - Multi-Phase Transients from DataNode 61000 Merged into Single Event
- Products Designed Based on Customer Feedback
  - IEC 61850 Compliance
  - Greater Reliability
  - Adjusted Feature Sets
- Asia Distributor Meeting This Week: June 2-3



# Overview of Electrotek Concepts

# Electrotek's Leadership in Power Quality Standards of the Institute of Electrical and Electronics Engineers (IEEE)



Electrotek engineers chaired the IEEE working groups that developed the following standards:

- **IEEE Std 1159-1995**: Recommended Practice on Monitoring Power Quality
- **IEEE Std 1159.3-2003**: Recommended Practice for the Transfer of Power Quality Data (PQDIF)
- **IEEE Std 1409-2012**: Guide for Application of Power Electronics for Power Quality Improvement on Distribution Systems Rated 1 kV through 38 kV
- **IEEE Std 1564-2014**: Guide for Voltage Sag Indices
- Contributions to many more including **IEEE C37.114-2014** for fault location and **IEEE Std C37.111** for COMTRADE file format

# Electrotek's Work in the IEC



- Electrotek represents the United States as a technical expert on two IEC subcommittees:
  - **IEC Technical Committee 77A**
    - Working Group 9
      - Defines requirements for IEC 61000-4-30 Class and Class S monitors
  - **IEC Technical Committee 85**
    - Working Group 20
      - Defines the tests for Class A and Class S monitors in IEC 62586-1 and IEC 62586-2

# Electrotek Services and Software Services

## Industrial Studies

- Power Quality Audits
- Data Center Problems
- Harmonic filter designs / Power Factor Correction
- Mining (Gold, copper, coal mines)

## Utility Studies

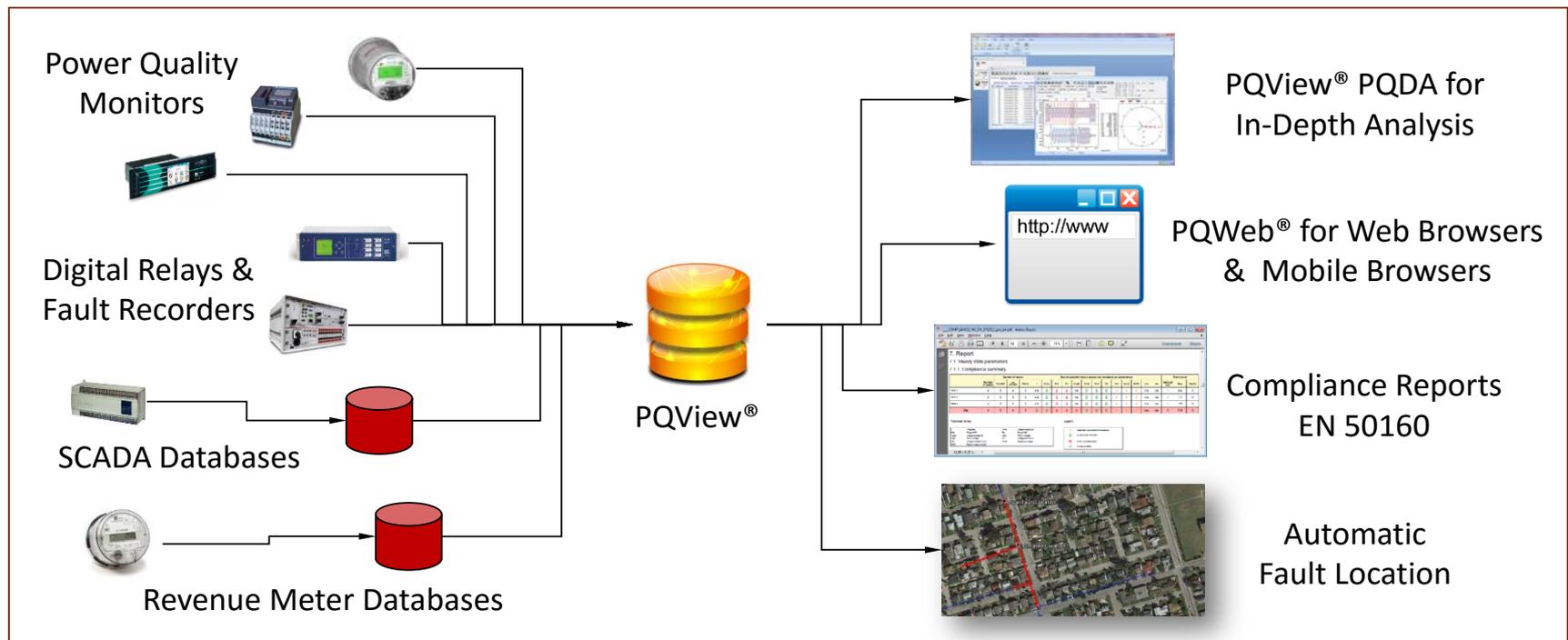
- Power Analysis and Simulation Studies
- Power quality department development
- Capacitor Studies
- Voltage Sag Studies
- PQ Seminars and Training

## Software

- PQView<sup>®</sup>, PQDiffraction<sup>®</sup>, TOP, The Output Processor<sup>®</sup>, SuperHarm<sup>®</sup>, ARS

# What is PQView?

- PQView integrates waveforms and data logs from power quality monitors, digital relays, digital fault recorders, SCADA databases, and smart meters
- PQView provides desktop and web power quality & fault, analysis, reports, and fault location.



# What are the data sources for PQView?

- IEEE® PQDIF
- IEEE® COMTRADE
- MODBUS®
- Advantech®
- Arbiter® Systems
- BTECH®
- CYMDIST from Eaton/Cooper
- Dranetz®
- EDMI
- Electro Industries®
- ENTSO-E Loads
- Environment Canada
- Fluke®/RPM
- General Electric GE®
- GridSense
- HIOKI
- I-Grid®
- OSIssoft® PI System
- Power Monitors
- PSL PQube®
- Gossen Metrawatt
- Qualitrol® /LEM
- SATEC
- Schneider Electric®
- Schweitzer Engineering Laboratories®
- Siemens®
- Synergi Electric from DNVGL
- TECTRA ALFA
- Unipower®

# What can you do with PQView?

- Store Billions of Power System Monitoring Measurements in an ODBC Database
- Import /Export IEEE PQDIF and COMTRADE
- Integrate Data from 50 Different Systems
- Define and Schedule Automatic Compliance Reports using Automatic Reporting
- Share Data via Web Browsers on an Intranet/Internet using PQWeb®
- Perform Voltage Sag and Fault Event Analysis
- Export Charts & Tables to Microsoft Word
- Derive Power Quality Indices
- Send Email Notifications
- Compute IEEE 1564 SARFI Indices
- Build EN 50160 Compliance Tables
- Build Norwegian NVE 1557 Compliance Tables
- Analyze Rapid Voltage Change Events
- Correlate PQ and Fault Events with SCADA
- Compute Phasors, Symmetrical Components, Line Frequency, THD, and Harmonics from Waveforms
- Create Data Log Trends, Histograms, Profiles, Scatter Charts, and Statistical Summary Tables
- Generate ITIC, SEMI-F47, and Custom Voltage Sag Magnitude-Duration Charts
- Summarize Voltage Sags using IEC 61000-2-8, 61000-4-11, and UNIPEDD DISDIP Tables
- Identify, Analyze, and Locate Faults
- Determine Voltage Sag Source Direction
- Assess Capacitor Bank Health
- Estimate Load Growth
- Benefit from Worldwide Collaboration of PQView Users Group

# What is New?

## PQView 3

- Version 3.81.07 Released in April 2016
- Updates for Microsoft Windows 10
- Updates for Microsoft Office 2016
- Updated Data Handler for IEEE PQDIF Files and COMTRADE Files
  - Download from FTP Servers
- Updated Data for ION Databases (StruxureWare)
- Updated Report Writer in PQ Data Analyzer (PQDA) Module
- New University Edition Available for Researchers
- Automatic Reporting Software (ARS) Now an Electrotek Product
- Fault Analytics and Fault Analysis Enhancements

# What is New?

## PQView 4

- New Platform based on Microsoft.NET
- Direct Access to Meter Real-Time Information
- Scalability and High Availability Features in PQ Data Manager Service (PQDMS)
- Direct Integration of PQ Monitors and Relays
  - Dranetz, Schneider Electric ION, PSL PQube, Arbiter, General Electric, Schweitzer Engineering, Modbus
- All New PQWeb Interface using Responsive Web Design and Interactive JavaScript Charting
- Federate More than One Database and More than One Data Source at Runtime

# What is New?



The screenshot shows a web browser window with the address bar displaying <https://www.pqweb.com>. The website has a dark blue header with the PQWeb.com logo, which features a stylized waveform and the text "PQWeb.com". Below the logo are navigation links: HOME, REQUEST QUOTE, DEVICES, DEMO, and LINKS. A blue banner below the header contains the word "Home" on the left and "Home > Home" on the right. The main content area has a heading "The Power of PQView® in your Browser!" in red. Below this heading, there are two columns of text. The left column is titled "PQWeb.com gives you access to data from the following devices:" and lists three items: Dranetz® DataNode® & PQNode® Monitors, Dranetz portables including Power Xplorer® PX5, PowerGuide 4400, & HDPQ®, and PSL Power Standards Labs® PQube® Monitors. The right column is titled "Powerful analysis tools from PQView®, the best-in-class power quality monitoring software" and lists three items: View waveforms and data logs, Map voltage sag events geographically, and View your system at a glance via an interactive dashboard. At the bottom left, there is a logo for "ELE" and a URL <https://www.pqweb.com>. At the bottom right, there is a small text "nts reserved."

HOME REQUEST QUOTE DEVICES DEMO LINKS

Home Home > Home

## The Power of PQView® in your Browser!

**PQWeb.com gives you access to data from the following devices:**

- Dranetz® DataNode® & PQNode® Monitors
- Dranetz portables including Power Xplorer® PX5, PowerGuide 4400, & HDPQ®
- PSL Power Standards Labs® PQube® Monitors

**Powerful analysis tools from PQView®, the best-in-class power quality monitoring software**

- View waveforms and data logs.
- Map voltage sag events geographically.
- View your system at a glance via an interactive dashboard.

<https://www.pqweb.com> nts reserved.

# Electrotek Web Sites

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- [www.electrotek.com](http://www.electrotek.com)
  - General Information
- [www.pqweb.com](http://www.pqweb.com)
  - Hosted PQView Databases
- [www.pqview.com](http://www.pqview.com)
  - Trial Versions, Documentation, Downloads
- [www.pqsoft.com](http://www.pqsoft.com)
  - Software Solutions for Power Quality Analysis

In Conclusion...

Superior Hardware  
Superior Software  
Market Leadership