

# Dranetz Industry Leading Portable Products

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### Dranetz 3 phase Power Monitors

#### Best - PowerXplorer

High speed transients Advanced metering

#### Better - PowerGuide

Answer Modules Additional recording depth

#### Good - PowerVisa

Entry level PQ Meets PQ standards Demand & Energy Harmonics

#### Starter - Energy Platform

Demand & Energy Focus 3 phase metering Harmonics Limited PQ







Top of the line

Great feature set

Value oriented PQ monitor





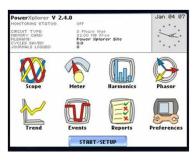
Low cost, best in class power monitor

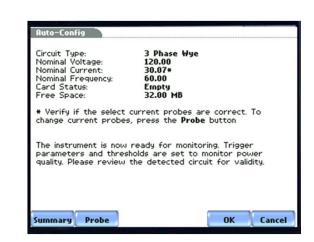




## All products have many features in common

- User Interface
  - ¼ VGA Color Touch-Screen
  - Color Graphical Interface Icon Based
- Easy to use
  - Automatic setups Automatically detects circuit type!
  - 'Wizard' manual setups guides the user through settings
- Large Memory
  - 4GB (minimum) Compact Flash
  - Largest in the industry
- Includes many languages
- 'Best in class' measurements at every price point
- Compatible with DranView







## **Common Features**

### Data Acquisition

- 8 Channels
  - 4 Voltage, 4 Current (AC & DC)
  - differential
- 256 samples per cycle
- Harmonics to the 63<sup>rd</sup>
- Low Frequency Transients (up to 5kHz)
- Medium Frequency Transients (5KHz 500kHz)

#### Accessories

- All 4300 & 658 (w/adapter) compatible CTs
- Weather resistant enclosures
- Communication Adapters (Ethernet, USB & Serial)
- Software
  - Dranview
  - Nodelink





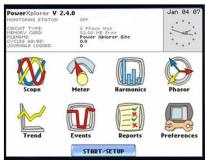




## **Common Features**

- Triggers
  - VRMS & IRMS
  - V Transients & I Transients
    - Peak, rms & (2) waveshape
- Power parameters
  - W, VA, PF, etc.
- Harmonics, Interharmonics
- Flicker
- Many built-in languages



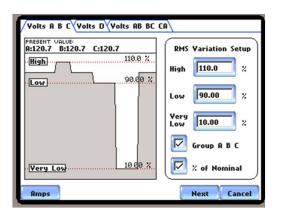


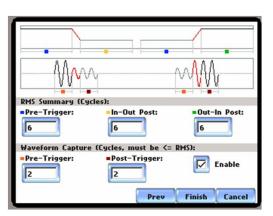


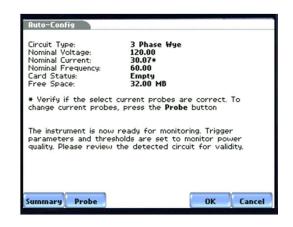


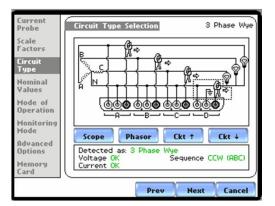
### Ease of Use

- Automated and Manual setups!
  - Detects wiring configuration
  - Detects nominal voltages
  - Configures appropriately
  - Provides feedback of wiring mistakes
  - Just press OK to go











## **Answer Modules**

- Available for PG4400, PX5 & PX5-400
  - Sag Directivity
  - PF Capacitor Switching
  - Motor Panel
  - Not available on the PowerVisa



Trigger		Threshold	Min	Мах
RMS High, Low, Yery Low		264.0 216.0 24.00	15.15	174.0
Absolute Instantaneous Peak		400.0	18.52	328.1
RMS Distortion Waveshape		16.80	163.0	254.6
Cycle-to-cycle Waveshape		24.0, 10.0%	Triggered	
Integrated High Frequency Trigger		240.0	Not Triggered	
10:18:36.599 - 10:1 CHANNEL:: CATEGORY: CLASSIFICATION: DURATION: DIRECTION:	AV, Short I Instant	Ouration aneous Sag ycles (30.00mSE)	<b>ES</b> 3	



### International Customers

#### **Electric Utilities**

Electricité de France Fnea -Poland

KW Belchatow - Poland

Energa – Poland PSE - Poland

Electrabel – Belgium

Fecsa Endesa Gesa Endesa

Unión Fenosa Distribución

**EDF Energy United Utilities** Northern Electric

Western Power Distribution Companhia de Electriciadade, Macau

JiangSu EPRI, China

Sunnfjord Energi A/S/ Norway

ELES - Elektrogospodarstvo Slovenije Slovenia

Elektro Primorska Slovenia

**HEP Transmission Company Croatia HEP Distribution Company Croatia** 

Guangdong EPRI - China

Shanghai Municipal Electric Power Company

Shanxi EPRI - China

Companhia de Electriciadade, Macau

JiangSu EPRI, China

Sunnfjord Energi A/S/ Norway

Shanghai Municipal Electric Power Company

Shanghai Metro Traffic Co

China EPRI HFFFI FPRI

#### Commercial/Industri

Olmex-Poland Cuprum -Poland

Hewlett Packard -Netherlands

Kemira GrowHow

Netherlans

Volvo Ghent

Corus – Nthlds AluminumSolvay

Daikin Europe Ibm jAPAN

Belgian Navy

AIB Vincotte Port of Antwerp

European Research Inst. Power Quality Control -

Spain

Fundación Labein

Opel Belgium Antwerp Ayuntamiento Zaragoza Instituto de Tecnología

Eléctrica

Revoz/Renault Slovenia Shanghai Metro Traffic Co

#### Finance/Banking

Banco de Peru Banco Popular Bloomberg, UK Credit Suisse, UK

#### Consultant/OEM

Gamesa Eólica-

Spain

Molinos del –

Spain

EbroCiemat-Spain

Chloride Power

Protection

**Halcyon Drives** 

MGE



### International Customers

#### Railways

Metro de Madrid, S.A. Dimetronic-Spain

#### **Government**

A.E.N.A. - Aeropuerto de Barajas A.E.N.A. - Aeropuerto de Barcelona A.E.N.A. - Aeropuerto de Gerona A.E.N.A. - Navegación AéreaRetes 22 Arsenal Militar del Ferrol London Air Traffic Control MI-5

#### Computer/Information/Te

Vodafone España, S.A. TVE Informatica del Ayuntamiento de Madrid SDC Ltd

#### **Education**

Universidad de Vigo

Universidad de Zaragoza
Universidad de Málaga
Universidad Politécnica de Cartagena
Universidad de Oviedo
CITCEA - Universidad Politécnica de Cataluña
Universidad de Sevilla
Universidad de Cordoba
Universidad de Vigo

#### Consultant/OEM

Gamesa Eólica-Spain
Molinos del –Spain
EbroCiemat-Spain
NAVANTIA - Astillero del Ferrol
STM de Alta Tension
Construcciones y Montajes
Industriales
Sistemas Electrónicos de Potencia
Mimaven Electrica
Tempe, S.A
Fullink UPS
Socomec

#### Commercial/Industri

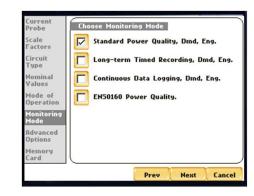
Olmex-Poland Cuprum -Poland Hewlett Packard -Netherlands Kemira GrowHow Netherlans Opel Belgium Antwerp Volvo Ghent Corus – Netherlands AluminumSolvay Daikin Europe Zardoya Otis Shanghai ZhengHua Harbour Machinery Corp. Siemen China Factory Automation Co. Ltd/GDEPRI

AIB Vincotte Port of Antwerp European Research Inst. Power Quality Control - Spain Fundación Labein Avuntamiento Zaragoza Instituto de Tecnología Eléctrica CEPSA, S.A. Peugeot EspañaAcerinox Pfizer, UK Renault, Sovenia Sintef Statoil **SKYGUIDE** Pfizer, UK Renault, Sovenia Elgar Sorenson



### **PowerVisa**

- Powerful, yet cost effective PQ, Demand & Energy
  - Easy to Use
    - · Color touch screen
    - · Auto setup
    - Color report screen
  - 4 Monitoring Modes, 100 cycles per event capacity
  - Advanced energy monitoring
    - · Simultaneously monitor PQ & Energy
  - Multiple Languages
  - IEC 61000-4-30 Class A compliance
    - IEEE harmonizing to this standard
  - Large memory
- Advantages Why compromise?
  - PowerVisa offers the benefits & features customers expect from DBMI at the prices of less capable competitors!
  - DranView is far superior than any competitors SW

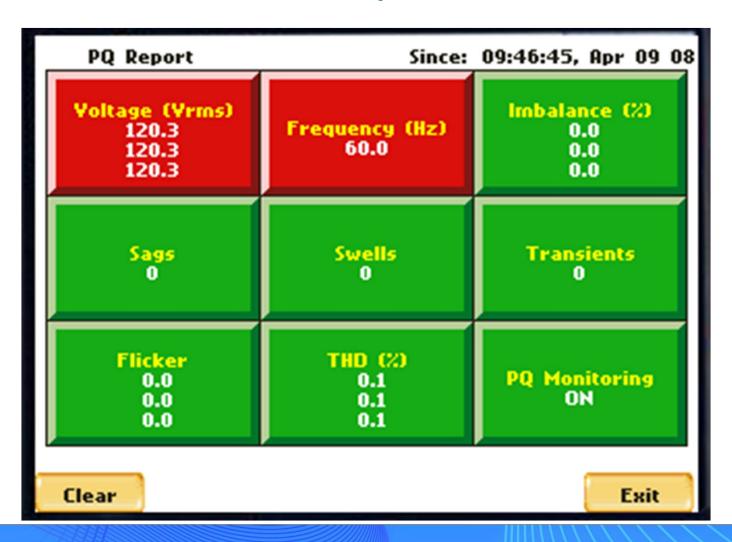








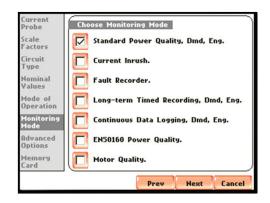
## PQ Report





### PowerGuide

- Power Visa Benefits & Features Plus
  - 7 Monitoring modes vs. 4
  - 11 Languages vs. 7
  - 10,000 cycles per event capacity vs. 100
  - Answer Modules
    - Sag Directivity
    - PF Capacitor
    - Motor Quality
- Advantages
  - · Competitively priced
  - Large memory
  - More advanced capabilities than PowerVisa
  - Answer Modules provide a consultant in a box...







## PowerXplorer

- PowerGuide Benefits & Features Plus
  - High speed digitized transients to 1us
  - Advanced metering
  - PX5-400 adds 400Hz capabilities
- Advantages
  - Uncompromising PQ
  - Ease of use
  - Simultaneous energy capabilities







### **Accessories**

# Energy Platform, PowerVisa, PowerGuide, PowerXplorer













### Flexible Current Probes

- Flexible CT's, Single Phase, AC Only
  - DRANFLEX3000XL 30A,300A, 3000A ranges
    - Available in 24, 36 and 48 inch lengths
  - DRANFLEX6000XL 60A,600A, 6000A ranges
    - Available in 24, 36 and 48 inch lengths
- Flexible CT's, Three Phase, AC Only
  - DRANFLEX3003XL 30A,300A, 3000A ranges
    - Available in 24, 36 and 48 inch lengths
  - DRANFLEX6003XL 60A,600A, 6000A ranges
    - Available in 24, 36 and 48 inch lengths







### MicroFlex Current Probes

- MicroFlex CT's, Single Phase, AC On
  - MFLEX6PKG 3/30/300, 6" PROBE





### Flexible Current Probe Power Supplies New

- Isolated Flex Probe Power Supplies
  - Isolated to reduce effects of power supply noise on sensitive CT's
  - Used with all Dranetz Flex CT's

• **ISOFLEX-MHXL4P\*** Isolated power adapter with cable for up to four probes,



 ISOFLEX-MHXL\* Isolated power adapter for one probe





### Miscellaneous Accessories

### Communications Adapters (includes NodeLink)

- COMM-RS232 Fiber to RS232 adapter
- COMM-OEA Fiber to Ethernet adapter with power supply
- COMM-OUA Fiber to USB adapter
- CFDATA-DB CF Data Card
- BP-PX5 Battery Pack
- XBC-PX5US External Battery Charger/UPS
- VCP-4300 Voltage Cable Accessory Pack
- Enclosures & Cases
  - ENCL-HH 12 x 14 Fiberglass Enclosure
  - LPC-PX5 Lockable Portable Case
  - SCC-4300 Soft Carry Case
  - RSC-4300 Rugged Ship Container



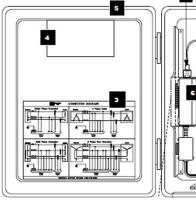
**COM-OEA** 

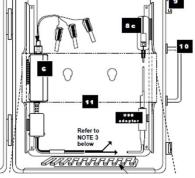


**RSC 4300** 



LPC 4300





**ENCL-HH** 



#### Miscellaneous Accessories

- FVA-1 Single Fuse Voltage Adapter
- FVA-4 Set of four Fuse Voltage Adapters
- Reliable Power Meter/Fluke1750 Current Probe Adapters
  - TRTOREDEL Adapter for RPM Clamp-On CT's
  - TRTORFLEX Adapter for RPM Flex CT's
- PPA-PP1R/115 Phase Power Adaptor
- 83003967 Phase Power AC Cord





Phase Power Adapter



## DranView 6 Introduction



## What is DranView?

- PC Based power analysis software
- Compatible with all current and many legacy Dranetz-BMI products
  - 4400/PX5
  - Power 1000
  - Encore Series
  - 4300, PP1, 658
  - PQDIF files
- Intuitive and easy to use Power Quality and Energy browser
- Visualization, Analysis and Reporting
  - Timelines/trends: Any parameter recorded by the instrument
  - Event details: Waveforms, text summaries, harmonics
  - Multiple level zooming into all data
- Report writer for automatic or custom/editable reports



## What is DranView?

- Multi-pane browser
  - Timelines, event details, event lists, etc are displayed in separate panes (windows) within DranView.
  - Each panel relates to the others: Select a point on the timeline or event list and the
    event details at that point in time are displayed in another pane.
- Rescue Kit
  - Correct and make adjustments to monitoring results.
  - Examples: Adjust times, flip probes, change scaling, etc...
- Special features such as the Harmonics Demo Tool



## DranView 6 Introduction

- HASP based license
  - Supplied with the latest secure HASP technology
  - Site license available for 11+ users
- Many standard features including:
  - Automatic Internet program updates
  - Unlimited undo/redo
  - Event sorting and filtering
  - Scrollable/Rollable axis'. Panning & rubber band viewing
  - Report writer always creates RTF files. Built-in RTF editor
  - Report writer detects monitoring mode and defaults appropriately
  - Standard Rescue Kit



## DranView 6 Introduction

- DranView 6 is available in two versions. Each version has packages available for different instruments and combinations.
- DranView 6 PRO Powerful, yet easy to use Intended users:
  - Entry level users. Simplified feature set
  - Knowledgeable users who do not require the advanced features of Enterprise
  - Single site. Those who view data one site at a time and typically do not use many instruments simultaneously
  - Costs sensitive users
- DranView 6 Enterprise Advanced feature set Intended users:
  - Users who prefer an advanced feature set. Many new features not available in PRO
  - Multiple sites. Those who use multiple instruments in parallel or need to easily compare data between sites or instruments.
  - Those that require different file formats such as PQDIF, COMTRADE
  - Those who write reports and do presentations of data
  - Those who can benefit from an expert consulting tool



## **DRAN-VIEW**

**Power Quality Browser** 



Dran-View Professional Version 6.0.19

This product is licensed to:

This software is protected by copyright laws and international treaties, see menu About HASP Hasp-ID: 18694696

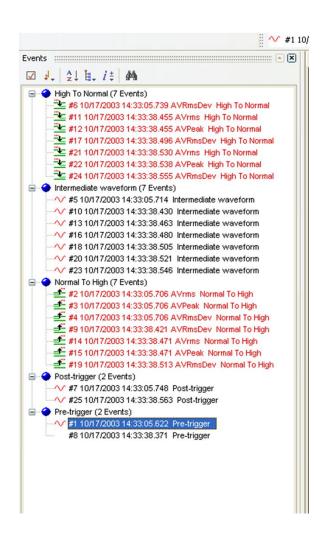
Note: Orange splash screen like the

4400



### DranView 6 PRO

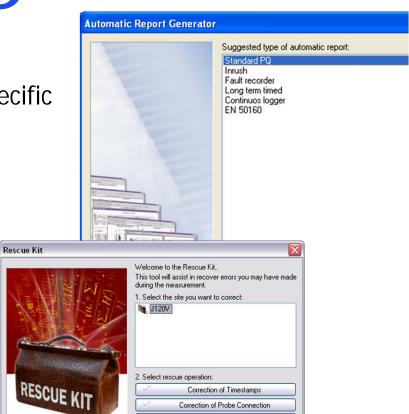
- General look and feel of DV5
  - Users should be very comfortable with the transition
- Automatic Internet updates
- Data analysis enhancements
  - Scrollable Pan left/right, up/down
  - Rubber band stretch and contract data
  - Note: Zoom capabilities remain unchanged
  - Chart area marking tool
  - Format templates
- Event pane
  - Event sorting and filtering





## DranView 6 PRO

- Report Writer enhancements
  - Monitoring Mode (4400/PX5) specific reports
  - Integrated RTF text editor
- Rescue Kit
  - Applies to all instrument types
  - Adjust time stamps
  - Reverse current probes
  - Change scaling
  - Change connection type



Correction of Scale Factors

Rescue

Note: The Rescue kit may not recover all your data, some

parameters may be impossible to re-calculate



## DranView 6 PRO

- Waveform post processor. For any waveform compute
  - Vrms, Irms, Vpeak, Ipeak,P, Q, S, VThd, IThd, PF, DPF, Frequency, Phase angle difference, Totals, L-L to L-N conversions
  - Harmonics & Phase angles
  - V & I Symmetrical components
  - V& I Unbalance factors
- Personal Notes
  - Add personal notes to the file. Comments, observations, etc...
- Significantly faster with better large file support





## Dran-View Enterprise Version 6.0.19

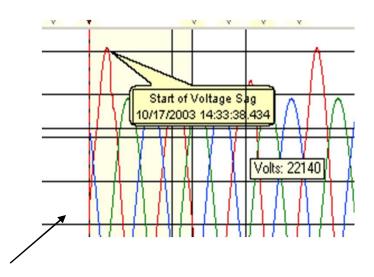
This product is licensed to: Ross Ignall Dranetz-BMI

This software is protected by copyright laws and international treaties, see menu About Exclusive Demo (85 days remaining)



## DranView 6 Enterprise

- Includes all DV6 PRO features plus...
- File formats
  - Read COMTRADE
  - Read PODIF
  - Read ASCII text files (\*.txt, \*.csv, \*.skv)
- Event data removal
- User interface & data analysis
  - Balloon text. Insert floating annotations
  - Drag & drop charts. Add and configure multiple data windows
  - Insert pictures
  - Customize toolbars, keyboard shortcuts



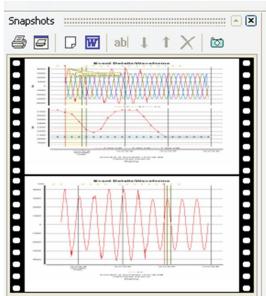


## DranView 6 Enterprise

#### • Camera



- Take a snapshot (bookmark) of a window (pane) for future reference
- Makes a record of a particular analysis configuration
  - Zoom, channels, colors, etc
  - Just select snapshot to display again
- Create a filmstrip of snapshots
- Easily create a Word file with all snapshots
- Report Writer
  - Insert pictures, diagrams, etc
  - Add selected and trends to a report
  - Reports for EN, IEC, G5/4, NVE standards
  - Multi-site report writing





## DranView 6 Enterprise

- Multi-Site Compare & correlate data from several sites/instruments
  - Up to 16 simultaneous data sets
  - Multi-site time synchronization
  - Mathematical comparisons between sites. Difference, etc...
- Event data removal
- User interface & data analysis
  - Drag & drop charts. Add and configure multiple data windows
  - Insert pictures
  - Balloon text. Insert floating annotations
  - Customize toolbars, keyboard shortcuts

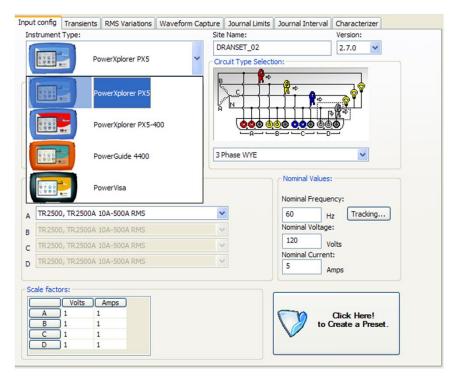


## DranSet Introduction

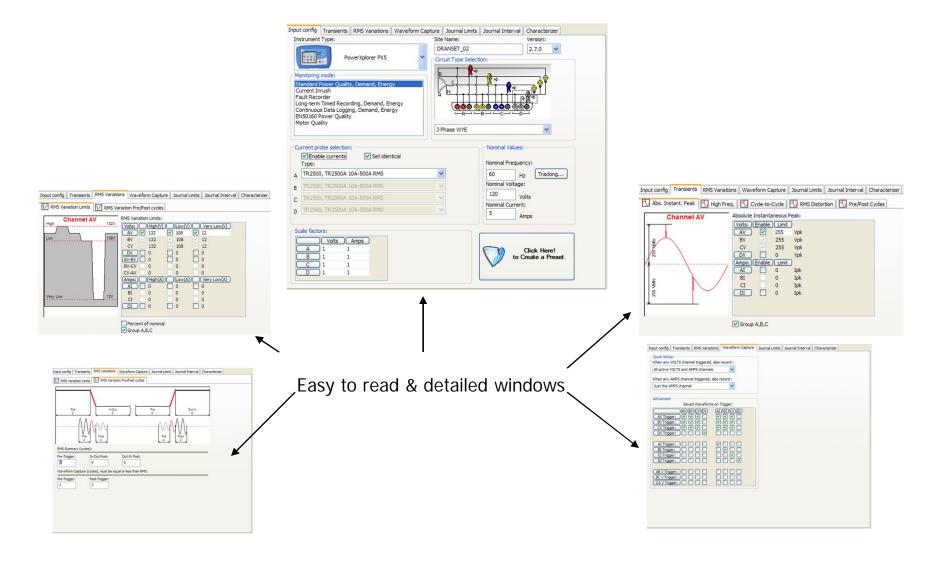


## What is DranSet?

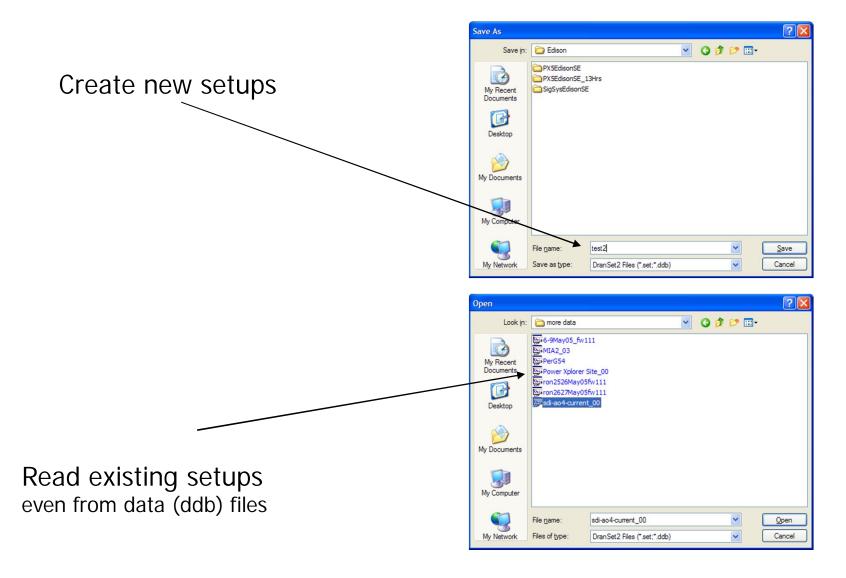
- Intuitive and easy to use setup utility software
- Create/edit monitoring setups without instrument
- For use with Dranetz-BMI models
  - PX5-400
  - PX5
  - PG4400
  - PowerVisa



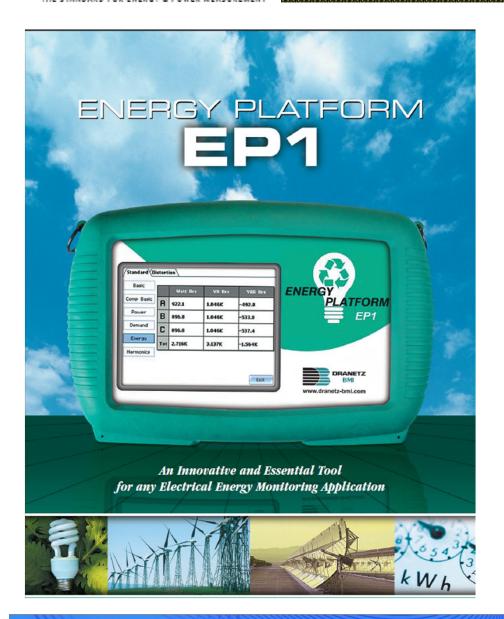






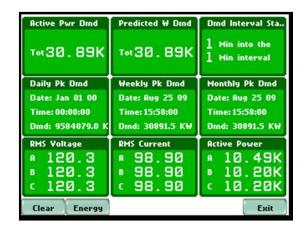






# 3 Phase Power Monitoring

## **Energy Platform EP1**





#### What is the EP1?

Portable, 3 phase instrument for Energy monitoring applications such as

- Electrical energy reduction & cost savings programs
  - How much energy is used? Where and when used? Daily, Weekly & Monthly KW/KWh
  - Determine energy costs
  - Determine electrical Carbon Footprint
- Alternative energy such as wind and solar
  - Monitor individual generators (panels, windmills) or total generation.
  - DC monitoring for solar applications.
  - Direction of energy flow. Producing or consuming electricity











#### What is the EP1?

Portable product for Energy monitoring applications such as

- General power studies
  - V, I, W, VA, VAR, PF, Demand, Energy + more
- NEC 220.87 demand surveys
- Load testing, commissioning
- Harmonic studies
- Simple PQ studies



#### **EP1 User Benefits**

- Powerful, yet very affordable power monitoring!
  - Better features and easier to use than competition but at a similar price
- Lightweight portable instrument 3.8lb (1.8Kg)
- Colorful user interface No PC software required
  - ¼ VGA color touch screen
- Easy to read Energy & Demand reports
- Carbon Footprint Calculator
- EPRW software (no license) included
  - EPRW: Energy Platform Report Writer software provided at no charge
  - DranView optional
  - New DranView energy audit report for use with EP1 & PX5 family products

Present Energy	Daily Energy Rat	Monthly Energy	
15:47:08 30.89 KW-s	Aug 25 09 609.25 W-Hr	Aug 25 09 609.25 W-Hr	
Days Into Billing	Daily Cost	Carbon Footprint	
25 Days into 31 Day cycle	0.07 USD	319.25 Њ СО2	
RMS Voltage	RMS Current	Active Power	
a 120.3	a 98.90	a 10.49K	
B 120.3	B 98.90	B 10.20K	
c 120.3	c 98.90	c 10.20K	
Clear Demand		Exit	



#### **EP1 User Benefits**

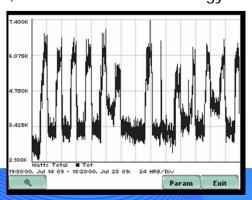
- Large Compact Flash memory for long duration surveys
- Automatic setup
  - No operational training required
  - Easy to use manual setups also available
- High resolution
  - 256 samples per cycle. 8 channels, 4V, 4I. Cycle by cycle accumulation with no gaps in measurements!
- High accuracy
  - 0.1% V&I (plus transducers)
- Packages include all that you need!
  - EP1, voltage cables, CT's, CF Card, Case, EPRW software
- Additional accessories available
  - DranFlex XL CT's, Clamp CT's, Enclosures + more
  - Compatible with the PX5 family

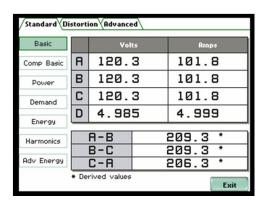


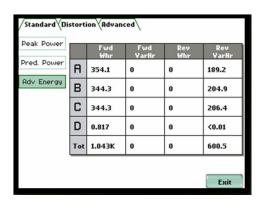


#### **EP1 Feature Set**

- Measured, Trended & Triggered Parameters
  - Very similar to PowerVisa
  - Cycle by cycle V & I. 256 samples/cycle
  - CAT III 600V
  - Power Trend min, max, ave
    - V, I, W, PF. DPF, TPF
  - Distortion Trend min, max, ave
    - Vthd, Ithd. VTID, ITID, TIF, TDF, K Factor
  - Demand
    - · Active, Apparent, Reactive Power Demand
  - Energy
    - KWh, KVAh, KVARh, Forward & Reverse Energy



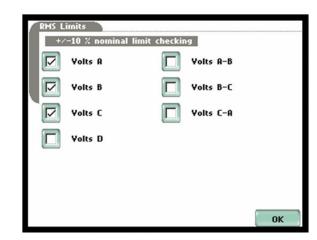






#### **EP1 Feature Set**

- Measured, Trended & Triggered Parameters
  - Journal trending and triggers work as PowerVisa
    - 200ms resolution on V, I, W, VA, VAR, THD, Harmonics, interharmonics and other parameters
  - Voltage and Current Power Quality is available but limited
    - Sag/Dip & Swell only
    - Cycle by cycle detection
    - No waveforms are available. Text summary of events only
    - Thresholds are fixed to +/- 10% of nominal automatically detected or manually entered.
    - Customer cannot change PQ limits. Can turn PQ triggers on and off
  - Flicker is not available





# **DRANETZ** Applications Guide

	PowerVisa/ Power Guia	EP-1
Power Quality Testing (IEC61000-4-30 Class A, IEEE1159)	Х	
Energy/Load Surveys & Studies	Х	Χ
Carbon Footprint Calculator		Х
Full Differential Channels	Х	D Channel
EPRW Software		X
Motor Testing	Х	Χ
Data Logging	Х	Χ
Harmonic Analysis to 63rd (IEC61000-4-7, IEEE519)	Х	X
Flicker per IEC61000-4-15, IEEE1453	Х	
Monitoring Modes	4	7
Pre/Fault/Post Cycles	100	
12 Languages	х	X



## **EP1** Reporting

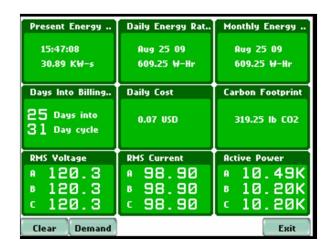
- Easy to read reports summarize your survey
- Demand Report
  - Present Demand
    - Present demand of the circuit
  - Demand Interval Status
    - Shows time into the demand interval such as 11 minutes into a 15 minute interval
  - Daily, Weekly & Monthly Peak Demand time/date
    - Customers can be billed on peak demand
    - This report shows the date and time of the peak demand for the current day, week and month
  - Real Time V, I, W meter
    - · Present metered values
    - Same as meter screen





#### **EP1** Reporting

- Energy Report
  - Billing cycle status
  - Daily & Monthly Energy
    - · Easily know how much energy is used.
  - Carbon Footprint calculator
    - Carbon Footprint represents the Carbon Dioxide CO<sub>2</sub> produced generating electricity consumed.
    - Various generation methods have different carbon footprints, i.e. coal, gas, oil, nuclear, hydro, wind, solar generation have a different impact on the environment. The lower the number, the less CO<sub>2</sub> produced.
    - Usually represented in pounds/KWh or Kg of CO<sub>2</sub> per KWh consumed
    - Can be an average representing all types of generation used by the utility.
    - Example: Pacific Gas & Electric (California, USA) publishes a Carbon Footprint of 0.524 pounds CO<sub>2</sub> /KWh of energy used.
  - Real Time V, I, W meter
    - Present metered values, Same as meter screen

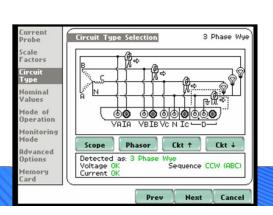


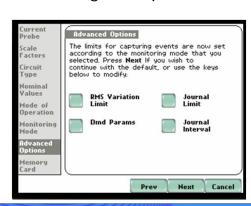
Carbon Footprint 319.25 lb CO2

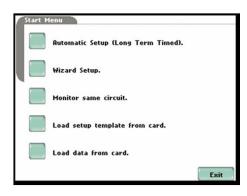


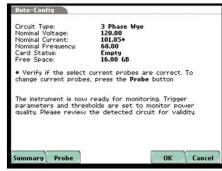
#### **EP1 Setups**

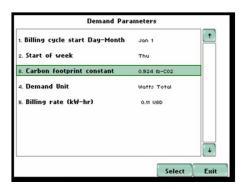
- Automatic setups
  - Automatic detection of Circuit Type
  - Factory default settings
  - User can select probe type
- Manual Setups Wizard
  - Customize recording and reporting parameters
    - Journal triggers High/Low limits
    - Journal intervals Demand interval, power& harmonics intervals
    - Demand unit W, VA, VAR
    - Carbon Footprint Pound or Kg, multiplier







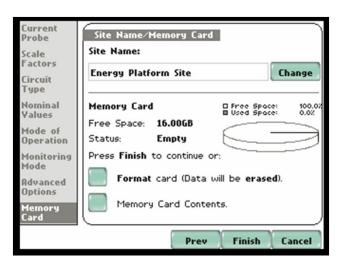






#### **EP1 Setups**

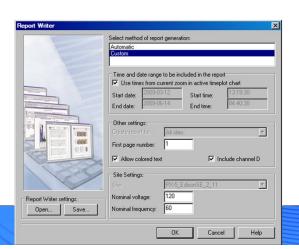
- Compact Flash Data Storage
  - 4GB (min) Compact Flash (CF) provided
  - Data and setups stored on CF card
  - Maximum file size is 256MB. Automatically starts a new file if fills during monitoring
  - CF Card is used to load data into the PC and for EPRW, DranView
    - Standard CF card reader used. USB, built into laptop, etc.
- EP1 has the largest data storage of any manufacturer

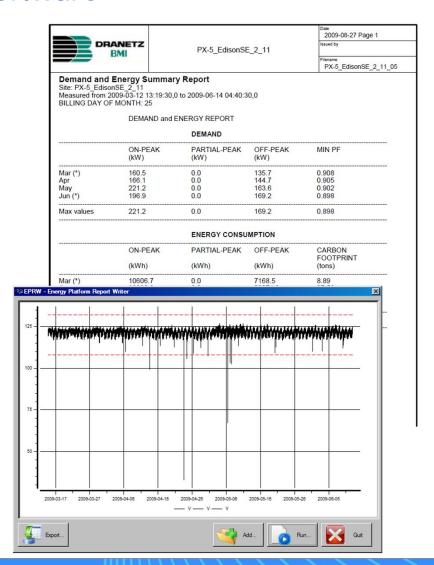




#### **EPRW PC Software**

- Energy Platform Report Writer software
  - Included in package at no additional cost
  - <u>Unlicensed No HASP</u>
  - Automatically produces an energy audit report in an RTF format
    - User selects time range of report
    - Includes Energy expense summary
    - · Time Of Use Billing, Trended data
  - Export data to .CSV files for use in other software such as Excel

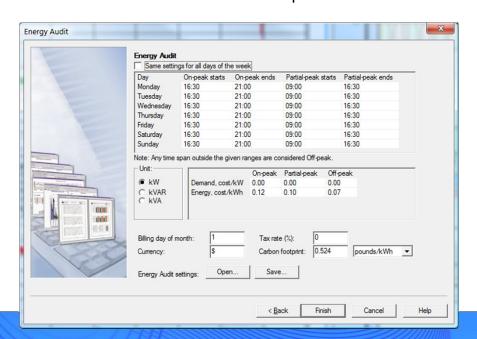






#### DranView PC Software

- Optionally available for use with EP1
- New driver to read EP1 data
- New Energy Audit report added to the DV report writer
  - Energy Audit report is similar to EPRW reporting features
  - Demand & Time Of Use reports



#### Time of Use Billing

Site: Willows Concession final Measured from 07/14/2009 11:12:09.0 to 07/29/2009 02:37:01.0 BILLING DAY OF MONTH: 1

#### TIME OF USE COSTS

		DEMAND		
	ON-PEAK (\$)	PARTIAL-PEAK (\$)	OFF-PEAK (\$)	
Jul (*)	0.0	0.0	0.0	
		ENERGY CONSU	MPTION	
	ON-PEAK (\$)	PARTIAL-PEAK (\$)	OFF-PEAK (\$)	
Jul (*)	36.6	50.4	39.7	
Total values	36.6	50.4	39.7	

(\*) Indicates partial month.



## The Right Tool for the Job







