



S E R I E S

61000 SYSTEM

The Intelligent Power Monitoring System



GOSSEN METRAWATT



DRANETZ™

THE STANDARD FOR ENERGY & POWER MEASUREMENT

THE INTELLIGENT INSTRUMENT

True to its four decade legacy as the industry leader in power quality analysis, Dranetz proudly presents Encore Series™, the next generation of permanent monitoring system for power quality, energy and demand, and process monitoring.

The Encore Series' System's configurable design allows users to specify the right instrument configuration for their specific application. All this flexibility in one instrument, combined with the multi-user web interface and a local color touch screen display (optional) of the PX5 family of portable Dranetz products, truly make the Encore Series the right product for your application.

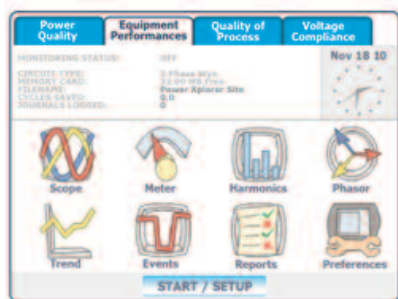
GROUNDBREAKING INNOVATION

Encore Series is the first truly modular and configurable instrument to shatter the traditional 8-channel (4 voltage/4 current) instrument format. Now you can have your choice of voltage, current modules and digital input modules to build from one to four instruments in a single compact, cost-effective format. Available modules are:

- 4 channel voltage input module (**V**)
- 4 channel current input module (**I**)
- 8 channel digital input module (**D**)

You will save money, appreciate the ease of installation and gain physical space by combining up to four modules in one instrument for applications that previously required two or more instruments. Popular combinations are:

- 4 channel Voltage Only monitoring: (**V**)
1 Voltage (**V**)
- 8 channel traditional power monitoring: (**VI**)
1 Voltage (**V**) & 1 Current (**I**) module
- 16 channel equipment performance (input & output) monitoring: (**VIVI**)
2 Voltage (**V**) & 2 (**I**) Current modules
- 16 channel substation feeder monitoring: (**VIII**)
1 Voltage (**V**) & 3 current (**I**) modules
- 16 channel voltage only, 4 independent PQ analyzers: (**VVVV**)
4 Voltage (**V**) modules

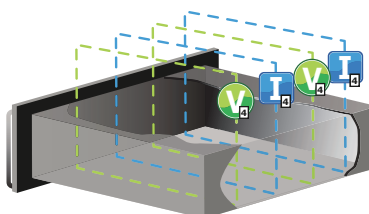


Optional local color touch display with tabs representing sample Encore applications

BUILD YOUR INSTRUMENT FOR YOUR APPLICATION

Encore Series permits you to combine user-specified, factory-installed modules for voltage, current and digital inputs. Combinations of up to four modules can be installed in one compact instrument. The instrument then allows you to combine modules to build your own instrument with up to four virtual analyzers.

As shown below, two voltage (**V**) and two current (**I**) modules are combined to build an Equipment Performance Analyzer for applications such as UPS Input and Output monitoring within one instrument.



Customize Encore 61000 for your application by choosing up to 4 modules to meet your application

KEY: Available Modules

		
VOLTAGE	CURRENT	DIGITAL INPUT

ENCORE™

S E R I E S



COMMUNICATIONS

Remote, fixed and semi-permanent applications require flexible and reliable communications. From high-speed fiber connections to analog modems, Encore Series' advanced communications work in the most demanding applications by supporting industry-standard methods such as:

- Standard: 10/100BaseT Ethernet port, RS232 and RS485
- Optional: analog modem, GSM, GPRS 3G/4G wireless
- Supported protocols include TCP/IP, HTTP, XML, Modbus TCP/RTU, IEC 61850, OPC
- Local and remote, networked communications IEC 61850, OPC
- Notifications: e-mail, contact closure, pager

VISUALIZATION AND ANALYSIS

The Encore Series Software remote web browser based user interface and 1/4 VGA color touch display is easy to use and requires little or no training. Encore Series Software (sidebar) provides advanced data characterization, trending, data analysis, reporting, real time and setups for one or more instruments.

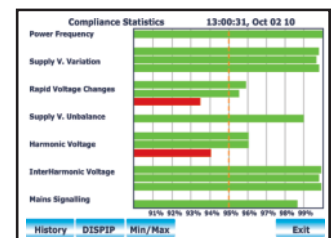
Available in both rack and switchgear mounting packages, the bright, colorful local display is perfect for on-site metering and data analysis. Local reporting is also available via a color-coded alarm/annunciator panel and EN50160 compliance reports.

COMPLIANCE

Encore Series is perfect for ongoing monitoring to determine

compliance with world-wide standards such as EN50160, IEC61000-3-6/7 and your own specialized compliance requirements.

Encore Series voltage modules are certified by an independent laboratory for Class A compliance with IEC61000-4-30: 2008. You can be confident that Encore Series measurements are accurate and repeatable and that they meet the most stringent requirements.



COMPATIBILITY

Encore Series Software lets you use existing assets while taking advantage of the latest features and benefits. Encore Series software fully supports:

- All Dranetz Signature System DataNodes (including ADAM Modules)
- Dial-up modem communications to the 7100 PQNode
- Electrotek's PQView enterprise software
- Dranetz's DranView PC software
- Arbiter Phase Meters

The generic modbus driver lets you map in other manufacturers' instruments for use with your Encore Series System.

OPC Gateway(Object linking and embedding for Process Control) exposes a common interface that can be accessed by other systems such as building management, SCADA or other software.

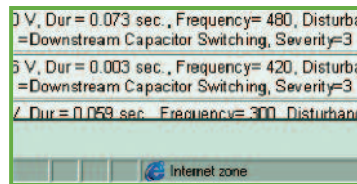
ENERGY MANAGEMENT

When and where electricity is consumed is invaluable information to have when developing energy reduction strategies. These strategies can include lighting upgrades, HVAC replacement, installation of high efficiency motors and/or adjustable speed drives and other cost saving measures. The data provided by Dranetz instruments arm the user with the information necessary to understand their facility, its loads and energy usage profile. This information, combined with the local utilities rate structure, enables the user to intelligently target areas of the facility in order to provide the best return on your energy reduction budget. Not only can overall energy usage be reduced, but utility charges such as power factor penalties and time of use demand penalties can be targeted for reduction by mitigating such problems or shifting loads to less expensive times of the day.

Utilizing the Encore Series Energy DataNode's along with the Encore Series Software, a facility can easily view many parameters including their instantaneous and historic demand/energy and associated costs at each point. Additionally, Encore Series Software has built-in reporting and analysis to know where, when and how much energy is being used. The available Energy Usage Answer Module provides reporting based upon your utility cost structure, giving you the power to know where to apply energy reduction initiatives and track ROI/savings over time to continually manage energy usage. This system proactively and continually monitors and when the programmed thresholds (limits) are exceeded can send out alarm notifications to as many individuals as needed. These notifications can be in the form of email, pager, or the increasingly popular text message to a cell phone.

INTELLIGENCE

The combined power quality knowledge of Dranetz and its sister company, Electrotek Concepts, gives Encore System the intelligence to perform advanced characterization of events. You receive a clear and simple explanation of an event with in-depth analysis.



The screenshot displays a list of power quality events. The first event shows a voltage sag of 0 V, duration of 0.073 seconds, frequency of 480 Hz, and a disturbance of Downstream Capacitor Switching with a severity of 3. The second event shows a voltage sag of 5 V, duration of 0.003 seconds, frequency of 420 Hz, and a disturbance of Downstream Capacitor Switching with a severity of 3. The third event shows a voltage sag of 7 V, duration of 0.059 seconds, frequency of 300 Hz, and a disturbance of Downstream Capacitor Switching with a severity of 3. The interface includes a search bar and a table with columns for Event Type, CH, Characteristics, Event Type, CH, Characteristics, and Status.

Unique Answer Modules® perform advanced analysis and provide answers to more difficult power quality events through an intuitive user interface. Answer Modules interpret data, making every user an expert. Answer Modules are available for every industry and include: Sag Directivity, PF Correction Capacitor detection/directivity, Energy Usage analysis/reporting, UPS performance and custom oneline diagrams.

UPS Verification Report				02-11-2002 12:00:00 to 02-13-02 17:06:49			
UPS Site		UPS Input Monitor		UPS Output Monitor			
	Event Type	CH	Characteristics	Event Type	CH	Characteristics	Status
Server Room 1	Instantaneous Sag	A	Mag-190.83V (0.69pu), Dur=0.033s (2.00 cyc.), Upstream Sag	None	n/a	n/a	Pass
Customer Center	Instantaneous Sag	B	Mag-58.17V (0.21pu), Dur=0.5s (30.00 cyc.), Category=2, Upstream Sag	Transient	B	Mag-252.07V (0.91pu), Max Deviation (Peak-to-Peak=124.2V (0.32pu), Dur=0.1s(6.00 cyc.), Frequency=345 Hz	Fail

PERFORMANCE EVALUATION

By combining multiple modules, Encore Series intelligently monitors and evaluates diverse equipment and power system performance parameters to evaluate the performance and health of your power system for applications such as:

- **UPS** – Encore Series monitors both input and output to continually evaluate the health of a UPS to ensure it operates correctly and to manufacturer specifications. An easy to read pass/fail report is available with the UPS Verification Answer Module.
- **System Reliability** – Gain a clear indication of power system reliability by simultaneously evaluating power quality of multiple circuits on an ongoing basis.
- **Predictive Maintenance** – Benchmarking provides a statistical evaluation to allow you to reduce costs by forecasting instead of scheduling maintenance.

ENCORE SERIES SOFTWARE

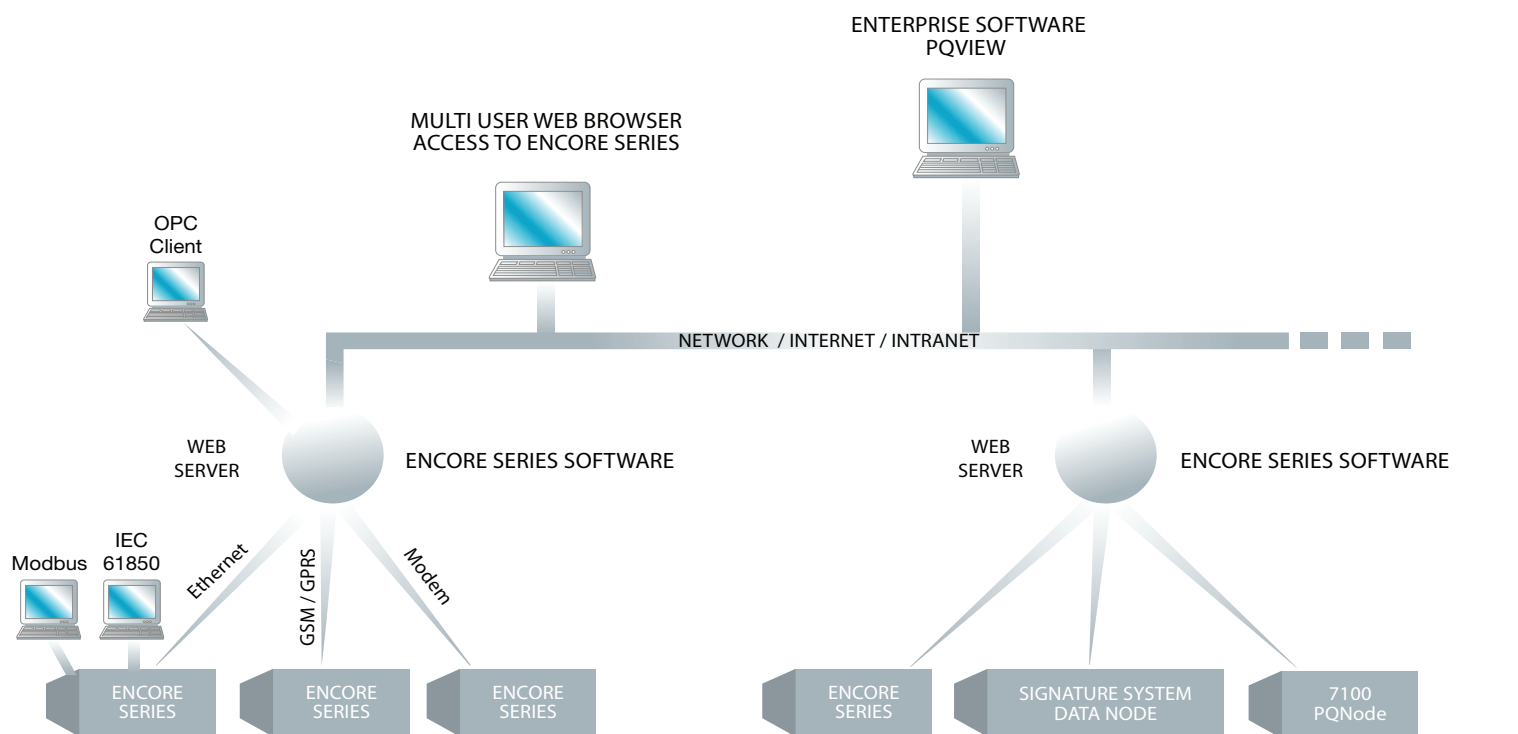
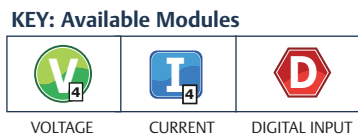
Encore Series Software (ESS) is available in two versions: full power quality/energy, and energy only. The heart of Encore Series is its web browser-based ESS. This advanced, intelligent software is both a system controller and a user interface for your entire system. ESS can be used in any application, from small systems with a few instruments to very large multi-point, facility-wide or utility monitoring systems with 100 or more points.

ESS automatically communicates with each instrument in your system via all supported communications methods to download and store data. ESS is also a password-protected web server that acts as the gateway to your Encore System. All user interactions with the system—such as trending, reports, real time and setups—are done using any web browser with connectivity to the system. The multi-user interface allows co-workers, engineers or consultants simultaneous access to analyze and share data and reports within a familiar web environment.

ENTERPRISE SOFTWARE

PQView®, which has become an integral part of utility smart grid initiatives, is a database software application developed by Electrotek Concepts that is designed to store and analyze large quantities of power quality-related disturbance and steady-state measurement data from hundreds of monitoring points. Featuring data management tools that can quickly characterize this data, PQView includes statistical analysis and plotting tools that can provide single- or multiple-site analysis for power systems. Encore Series is the only power monitoring system with standard PQView compatibility.

For smaller applications, use Dranview with Encore Series Systems. Dranview reporting and analysis software is powerful yet easy to use. Dranview's PQDIF file support lets you view data from Encore Series side by side with data from Dranetz's family of portable and hand-held instruments.



ENCORE SERIES / 61000 DATANODE

SPECIFICATIONS

VOLTAGE MODULES

- Channels: (4) differential inputs, AC/DC
- Sampling: 512 samples/cycle, 16bit A/D, synchronous sampling. Range: 1-600 Vrms, +/- 1000Vpk, 10-1000V RMS via pod
- Frequency: 50Hz, 60Hz
- Full Scale Accuracy: 0-600V 0.1% reading +/- 0.05% full scale, 7KHz bandwidth for low/medium frequency transients
100-300V AC 0.1% reading for IEC61000-4-30:2008 Class A
- Input impedance: 10MΩ to ground
- Choice of connections: Screw terminals, safety connectors, D connector for use with (optional) remote pod with screw terminals. Choose one.
- Optional: Anti Aliasing filtering hardware.

CURRENT MODULES

- Channels: (4) differential inputs, AC/DC
- Sampling 512 samples/cycle, 16 bit A/D. Range: Full scale current = 1.5Vrms, crest factor of 3
- Accuracy: 0.1% reading +/- 0.05% full scale, 3KHz bandwidth for low/medium freq. transients. Does not include CT.
- Choice of connections: Screw Terminals, TR connectors, D connector for use with (optional) remote 5A or 1A pod with screw terminals or 5A/20X pod with feed through tubes. Choose one.
- Optional: Anti Aliasing filters- Accuracy: +/-10% reading, +/- 0.5% full scale

DIGITAL INPUT MODULE

- Channels: (8)
- Sampling: 1KHz. Range: 0-135V AC/DC
- Triggers: Edge, level
- Connections: Screw terminals

MONITORING/COMPLIANCE

- IEC61000-4-30:2008 Class A, IEC61000-4-7, IEC61000-4-15
- EN50160, NVE, IEEE1159, IEEE1453, IEEE519, IEEE1459 ,CREG



Sample rear panel 61STD shown above.



POWER QUALITY TRIGGERS

- V & I RMS (Sag/Dip, swell, interruption) 1 cycle resolution , 1/2 cycle steps as per IEC61000-4-30
 - Reference: L-L, L-N Concurrently
 - Pre/Post cycles : 30 pre (max), 10,000 post (max)
- Transients:
 - Waveshape Triggers: Cycle by Cycle, RMS deviation
 - Peak transient
- Journals (stored parameters): High, low, very-high, very-low, Utility Frequency Trigger

MEASURED PARAMETERS (NOT LIMITED TO THE FOLLOWING)

- Power
 - V, I, W, VA, VAR, TPF, DPF, Demand, Energy, etc.
- Harmonics/Interharmonics/Distortion (per IEC61000-4-7)
 - Harmonics individual harmonic spectrum to the 63rd for V & I
 - Vthd, Ithd, Vtid, Itid, K factor, TDF, TIF, more
 - 5 user specified frequencies
 - Unbalance: Symmetrical components, worst from ave.
- Flicker (per IEC61000-4-15, IEEE1453): Pst, Plt, sliding Plt

COMMUNICATIONS:

- 10/100BaseT Ethernet, RS232, RS485,
- Optional GSM/GPRS, Analog modem, 3G/4G Wireless (IEC 61850, OPC are optional)
- Protocols: XML, Modbus TCP/RTU, HTTP
- Time synchronization: NTP, optional GPS

USER INTERFACE

- Remote: Web browser via Encore Series Software: Primary UI for setup, trends, reports, real time. Available languages; English, Spanish, French, German, Italian, Chinese. Instrument web browser for metering. English only.
- Optional Local Display: ¼ VGA touch screen remote display, rack mounted display. Languages: 12

GENERAL SPECIFICATIONS

- 61STD: (HxWxD): 4" x 11" x 8" (10.2cm x 28cm x 20.3cm), Weight: 4.2 lbs. (1.9 kg)
- 61SG/SGD: (HxWxD) 6.5" x 7" x 8", 10lbs (16.5cm x 17cm x 20.3 cm, 4.5kg)
- Operating Temperature: -10° to 60° C
- Storage Temperature: -40° to 85° C
- Humidity: 10 to 95% non-condensing
- System Time Clock-Crystal controlled-1 ms resolution
- Power supply:
 - 61STD: 90-264 VAC 47-63 Hz, (125-220VDC optional)
 - 61SG/SGD: 90-250VAC 50/60Hz, 105-125VDC (90-250VDC optional)
- Built-in UPS with 15 minute internal battery, field replaceable
- Memory 1GB, internal

MISCELLANEOUS OPTIONS

- Enclosures: Weather resistant, rack, wall, switchgear
- CT's: Clamp-on, split core, solid core, flex, DC



61SGD



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THE STANDARD FOR ENERGY & POWER MEASUREMENT

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