

ENCORE™

S E R I E S

61000 SYSTEM

the Intelligent Instrument



 DRANETZ
BMI

THE INTELLIGENT INSTRUMENT

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

The Encore Series' 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 of the Signature System and the local color touch screen display (optional) of the PX5 family of portable Dranetz-BMI 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 and data acquisition 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**)
- 4 channel (voltage or current) transducer input module (**T**)
- 8 channel digital input or 4 channel digital output module (**D**)

You will save money, prevent integration aggravation 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:

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

By adding data acquisition modules, new applications are created such as quality of process (**V, I, T, D**), grid stability (**V, D, D, D**) and more.

BUILD YOUR INSTRUMENT FOR YOUR APPLICATION

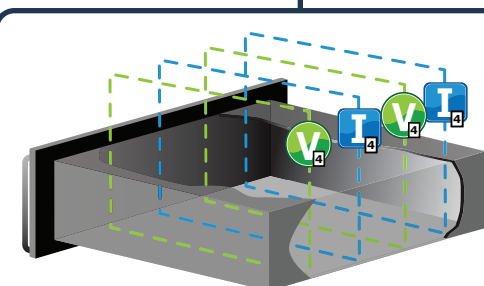
Encore Series permits you to combine user-specified, factory-installed modules for voltage, current, transducer inputs, digital inputs and outputs. Combinations of up to four modules can be installed in one compact instrument. The instrument then allows you to combine modules to build your own instrument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

As shown on the right, 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.

KEY: Available Modules



Optional local color touch display with tabs representing sample Encore applications



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

ENCORE™ SERIES

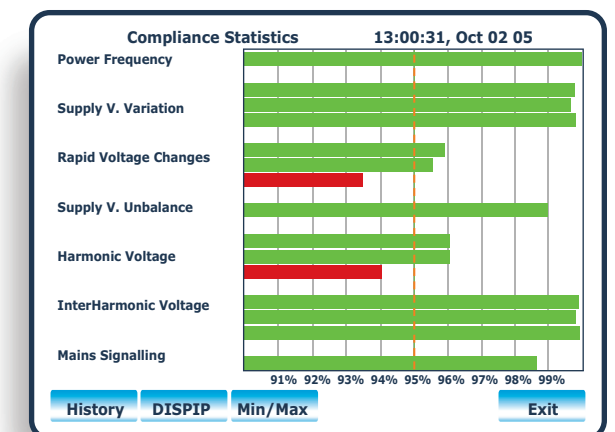


Encore 61000 shown with optional rack mount display

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. You can be confident that Encore Series measurements are accurate and repeatable and that they meet the most stringent requirements.



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
- Supported protocols include TCP/IP, HTTP, XML, Modbus TCP/RTU
- Local and remote, networked communications
- Notifications: e-mail, contact closure, pager

VISUALIZATION AND ANALYSIS

Data analysis and reporting couldn't be easier than it is with Encore Series' remote web browser-based user interface or local ¼ VGA color touch display. Encore Series Software (see right) provides a user friendly web browser environment for your entire system that provides advanced trending, data analysis, reporting, real time and setups for one or more instruments.

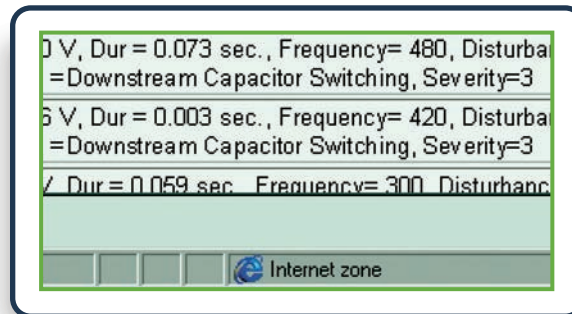
Available in both rack and switchgear mounting packages, the bright, colorful local display is perfect for on-site metering and data analysis. Local reporting is also available via a color-coded alarm/annunciator panel and EN50160 compliance reports.

INTELLIGENCE

The combined power quality knowledge of Dranetz-BMI 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.

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, radial line fault analysis and reliability benchmarking.



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.

UPS Verification Report		02-11-2002 12:00:00 to 02-13-02 17:06:49					
UPS Site	UPS Input Monitor			UPS Output Monitor			Status
	Event Type	CH	Characteristics	Event Type	CH	Characteristics	
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

COMPATIBILITY

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

- All Dranetz-BMI Signature System DataNodes
- Dial-up modem communications to the 7100 PQNode
- Electrotek's PQView enterprise software
- Dranetz-BMI's DranView PC software

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

ENCORE SERIES SOFTWARE

The heart of Encore Series is its web browser-based Encore Series Software. This advanced, intelligent software is both a system controller and a user interface for your entire system. Encore Series Software 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 50 or more points.

Encore Series Software automatically communicates with each instrument in your system via all supported communications methods to download and store data. Encore Series Software 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

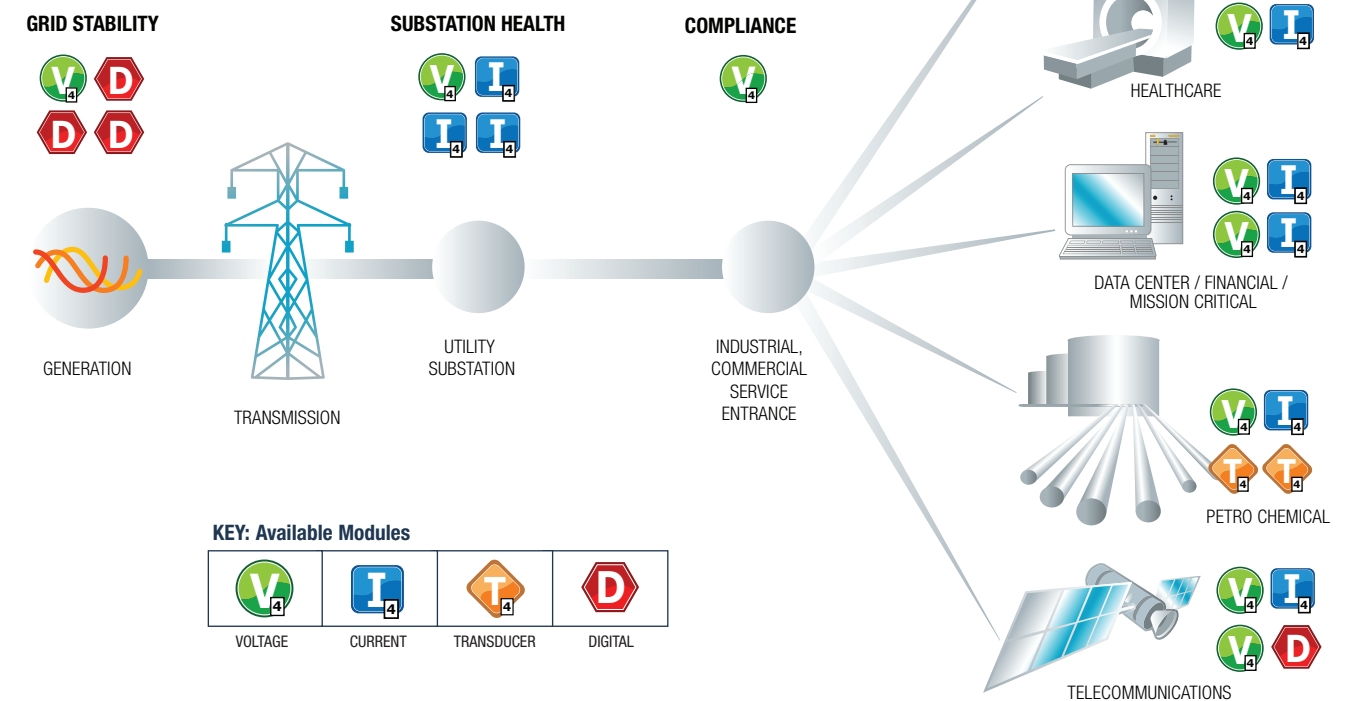
Enterprise software is available to expand the analytical capabilities of Encore Series and/or manage multiple monitoring systems.

PQView® 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-BMI's family of portable and hand-held instruments.

ENCORE SERIES / 61000 SYSTEM

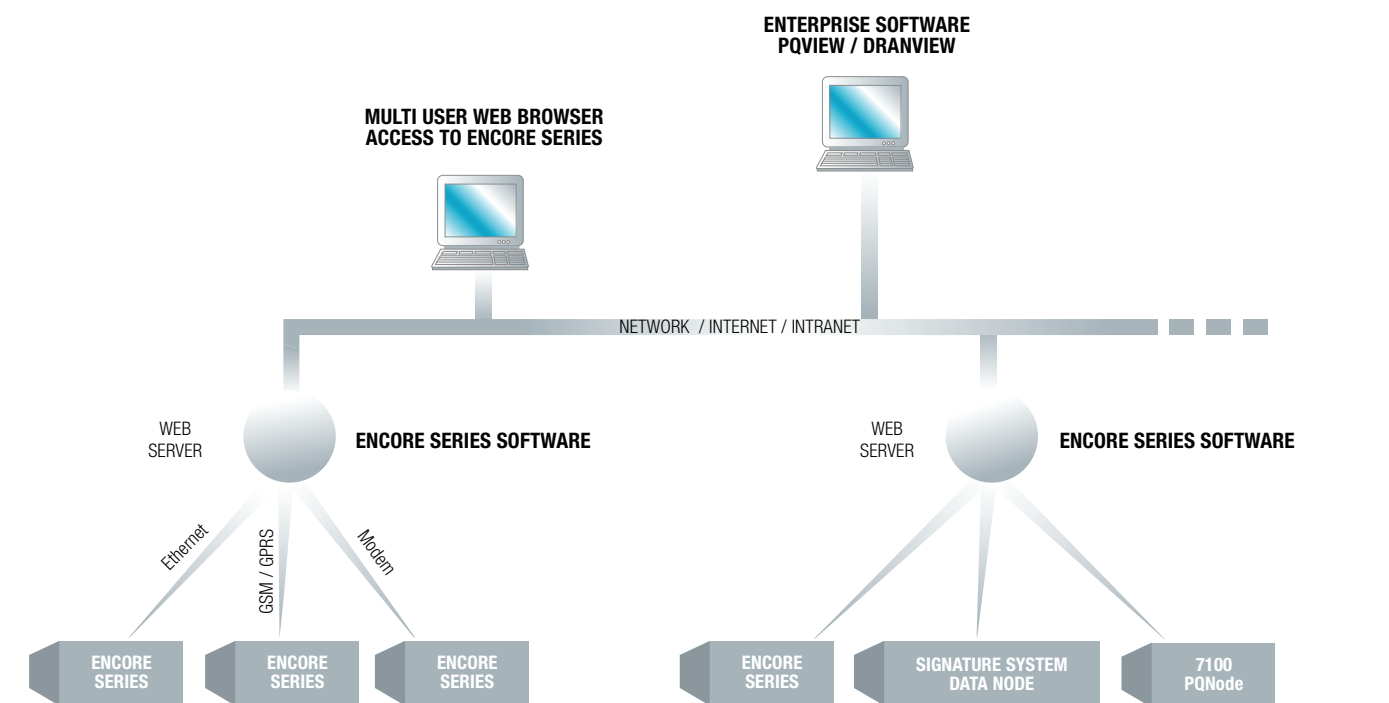
STANDARD AND CUSTOMIZED



APPLICATION CONFIGURATIONS

ENCORE SERIES / 61000 SYSTEM

ARCHITECTURE



VOLTAGE MODULES

- Channels: (4) differential inputs, AC/DC
- Sampling: 512 samples/cycle, 16bit A/D, synchronous sampling. Range: 1-600 Vrms, +/- 1000VPK
- Frequency: 16/20Hz, 50Hz, 60Hz, 400Hz (optional)
- 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
- 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 filters
- Optional: High Speed transients (total of 2 slots)
 - Sampling: 1MHz
 - Accuracy: +/-10% reading, +/- 0.5% full scale

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: 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
- Optional High Speed transients
 - Sampling: 1MHz
 - Accuracy: +/-10% reading, +/- 0.5% full scale

VOLTAGE TRANSDUCER INPUT MODULE

- Channels: (4) differential inputs, DC coupled
- Sampling: 100KHz. Range: 0-24VDC
- Accuracy: 0.1% reading +/- 0.05% full scale plus transducer accuracy
- Input impedance: >100KΩ to ground
- Connections: Screw terminals

CURRENT INPUT TRANSDUCER INPUT MODULE

- Channels (4) differential inputs, DC coupled
- Sampling: 100KHz. Range: 4-20ma
- Accuracy: 0.1% reading +/- 0.05% full scale plus transducer accuracy
- Connections: Screw terminals

DIGITAL INPUT MODULE

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

RELAY OUTPUT MODULE

- Channels: (4)
- Max voltage 250VAC/DC
- Type: Form C

MONITORING/COMPLIANCE

- IEC61000-4-30 Class A, IEC61000-4-7, IEC61000-4-15
- EN50160, NVE, IEE1159, IEE1453, IEE519, IEE1459
- IEC61000-3-6/7

REVENUE ACCURACY

- ANSI C12
 - ANSI C12.1 Accuracy compliant
 - ANSI C12.20.0.2 compliant
- IEC
 - IEC 60687 0.2S compliant
 - IES 60687 accuracy class 0.5S compliant

POWER QUALITY TRIGGERS

- V & I RMS (Sag/Dip, swell, interruption) 1 cycle resolution, ½ cycle steps as per IEC61000-4-30
 - Reference: L-L, L-N
 - Pre/Post cycles : 30 pre (max), 10,000 post (max)
- Transients:
 - Waveshape Triggers: Cycle by cycle, RMS deviation
 - High speed transients (optional)
 - Peak transient
- Journals (stored parameters): High, low, very-high, very-low

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)
 - Vthd, Ithd, Vtd, 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, USB (future functionality)
- Optional GSM/GPRS, Analog modem
- 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. Instrument web browser for metering. English only.
- Optional Local Display: ¼ VGA touch screen remote display, rack mounted display. Languages: 12

GENERAL SPECIFICATIONS

- Size (HxWxD): 4" x 11" x 8" (10.2cm x 28cm x 20.3cm), Weight: 4.2 pounds (1.9 kg)
- 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: 12VDC
 - 15 minute internal UPS
 - AC supply: 90-264 VAC 47-63 Hz
 - Optional 125VDC, 220VDC, 48VDC
- Memory 1GB, internal

SYSTEM CONTROLLER

- Industrial grade computing platforms: InfoNode model 5502 (CF memory), 5504 (hard disk). Choose one.

MISCELLANEOUS OPTIONS

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



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