

Datasheet: ION[®] Enterprise



Enterprise Energy Management Software

ION Enterprise™ web-enabled software is a complete energy information management solution for your business. It offers control capabilities, comprehensive power quality and reliability analysis and can help you reduce energy related costs. A powerful suite of applications allows you to collect, process, analyze, store, and share data across your entire enterprise.

ION Enterprise software is designed to extend the possibilities of ION intelligent metering technology giving you the information and analysis tools you need to make sound decisions.

Its cutting-edge flexibility and compatibility allow you to extend your energy management system at your own pace, adding newer components as they become available, without interrupting or impacting existing functions. Collect data through serial, wireless, modem or Ethernet links to manage a single site or use the Internet to connect a global network of devices. Interface to existing software systems and integrate third-party equipment, leveraging support for a variety of industry-standard protocols.

ION Enterprise also enables you to access information from any desktop, locally or around the world, in the format you need. Control of your system is always within easy reach.

Thanks to patented ION[®] technology, you get out of the box useability plus you can quickly add or rearrange functions with drag-and-drop icons and a few clicks of a mouse. Imagine any new feature and build it with ION.

Applications Summary

Power Quality and Reliability Analysis

Pinpoint the sources of transients, harmonics, or sags, whether external or internal to your facility, and decide on the right corrective actions. By monitoring circuits 24 hours a day, you can develop strategies to avoid interruptions.

Cost Allocation and Billing

Gain an accurate understanding of business expenses by tracking energy-related costs of each building, feeder, process or tool. Match virtually any billing structure and use comprehensive multi-year scheduling and time-of-use activity profiles. Participate in real-time pricing and retail wheeling.

Load Studies and Circuit Optimization

Trend information helps you use your electrical distribution system to full capacity and avoid over-design. Create usage profiles so you can distribute loads, avoid demand peaks and plan system expansion.

Demand and Power Factor Control

Eliminate penalties through automated power factor correction, load shedding, or peak shaving.

Equipment Monitoring and Control

Meter all your utilities including gas, steam, air and water. Implement automatic control based on combinations of conditions. Set up alarms to warn of pending problems or schedule maintenance. Interface with other energy management and SCADA systems through multiple communication channels and protocols.

Preventative Maintenance

Base your maintenance schedule on actual operating history. Log events and alarms.

Features Summary

Data Acquisition

- ◆ Store historic and event data in an SQL database
- ◆ Gather and access data via serial, modem and Ethernet links
- ◆ Interface to third party hardware and software through Modbus RTU and TCP, ODBC, XML and OPC
- ◆ Integrate metering of electricity, gas, water, steam, air, emissions and more

Monitoring

- ◆ Display real-time data and analyze logged information through a standard web browser
- ◆ Automatically or manually control any operation within your energy system remotely
- ◆ Customize graphics for alarms, status indicators, control triggers, and facility views
- ◆ Examine waveform overlays, odd/even harmonics, THD, K-factor, crest factor, vector diagrams, and symmetrical components
- ◆ Configure alarms to annunciate through a variety of methods including an operator's workstation, pager or email

Analysis

- ◆ Generate power quality, energy, and load profile reports based on event or schedule
- ◆ Correlate and categorize sequences of events
- ◆ Analyze disturbances by plotting waveforms, ITI (CBEMA) and SEMI voltage tolerance curves, and histograms

Control

- ◆ Process data from multiple devices and initiate actions or alarms based on the results
- ◆ Automatically perform load shedding, generator startup, or relay control
- ◆ Implement distributed control in response to interruptible rates or real-time pricing
- ◆ Perform remote control functions using MS Terminal Services



**POWER
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ION Enterprise Components

Vista™

Provides graphical views of real-time and historic information, analyzes data, reports equipment status, and offers control capabilities.

ION Virtual Processor™

Aggregates data from multiple sources, analyzes it and initiates coordinated actions based on the results. Perfect for demand control, cost allocation, and power quality.

Reporter™

Produces load profile, cost allocation, power quality, EN50160 compliance and custom reports.

Designer™ and Management Console

Lets you graphically configure and customize devices and ION Enterprise across your network.

SQL Database

Installed with ION Enterprise, this ODBC-compliant database logs all system data.

Firmware Upgrade Utility

Updates the operating software inside your ION devices whenever new versions are available.

WebReach

Uses a standard web browser to display basic meter information, including real-time data and logs.

ION Enterprise Networks

ION Servers

ION servers manage communication with devices in a system. They collect, store and present data as a centralized repository, making it available everywhere it is needed. Components like the Virtual ION Processor and SQL database provide sophisticated aggregation and calculation tools and support alarm features.

ION Clients

ION Enterprise components like Vista, Designer, and Reporter, while available on the server, can be installed and accessed on networked workstations for complete remote system administration, or automated reporting requirements.

ION Devices

Devices are grouped into "sites" based on their physical or logical locations and communication links, which can include Ethernet, serial, modem or gateway sites. Devices offer sequence of events recording, load profiles, power quality data, control, alarming, status indicators, revenue accuracy, and PLC/RTU capabilities.

Web Deployment

Elements of ION Enterprise can be accessed through the Internet or a corporate intranet using standard web technologies and a web browser

- ◆ WebReach allows multiple users to simultaneously view relevant information including real-time system data and advanced analysis views.
- ◆ Remote system administration can be achieved using Microsoft Terminal Services, providing access to all the advanced and control features of ION Enterprise.

Time Synchronization

ION Enterprise can synchronize a meter's clock to within ± 16 ms of other meters in a serial network (a GPS receiver can do it within ± 1 ms of Universal Time). By synchronizing the meters' internal clocks, accurate timestamps can be used to achieve precise sequence-of-events, power quality analysis and revenue-accurate billing.

Third-Party Integration

ION Enterprise supports Modbus RTU, Modbus TCP, XML, ODBC and OPC protocols, so you can unify your diverse operations in one system. Interface to other energy management software, or include transducers, PLCs, and RTUs in an ION Enterprise network. Extract values from other software applications like spreadsheets and web-based information sources, then combine those values with up-to-date readings from ION devices to perform real-time calculations.

ION Virtual Processor: for Analysis and Control

This powerful component performs system-wide data aggregation and supervisory control. It processes information from multiple metering sites and initiates actions based on the results. Decisions happen automatically in response to combinations of conditions. You decide what set of functions one or more ION Virtual Processors will focus on: power quality analysis, demand control, load profiling, cost allocation, alarming, substation automation, or other tasks.

Display and Configuration

Data, alarms, events, and control actions from the ION Virtual Processor appear in Vista just like information from an ION or third party device. Its operation is defined in the same way as an ION monitor's - you use Designer to graphically arrange drag-and-drop icons called ION modules.

Power Quality

A network of continuously-active ION devices and the ION Virtual Processor will help you determine the sources of power quality disturbances and alert you to phase imbalances.

The ION Virtual Processor can react to a power outage by running a PC application that dials a pager and can automatically trigger the Report Generator to produce reports on transients, sags, swells, or other events.

Cost Allocation

The ION Virtual Processor can track system-wide power factor, demand peaks, and penalty tariff structures.

Automated Control

The ION Virtual Processor can perform an enormous variety of control actions:

- ◆ Activate fans to prevent transformers from overheating if total harmonic distortion (THD) is too high.
- ◆ Shed non-essential loads or start up generators when demand exceeds a threshold.
- ◆ Control capacitor banks to correct power factor.

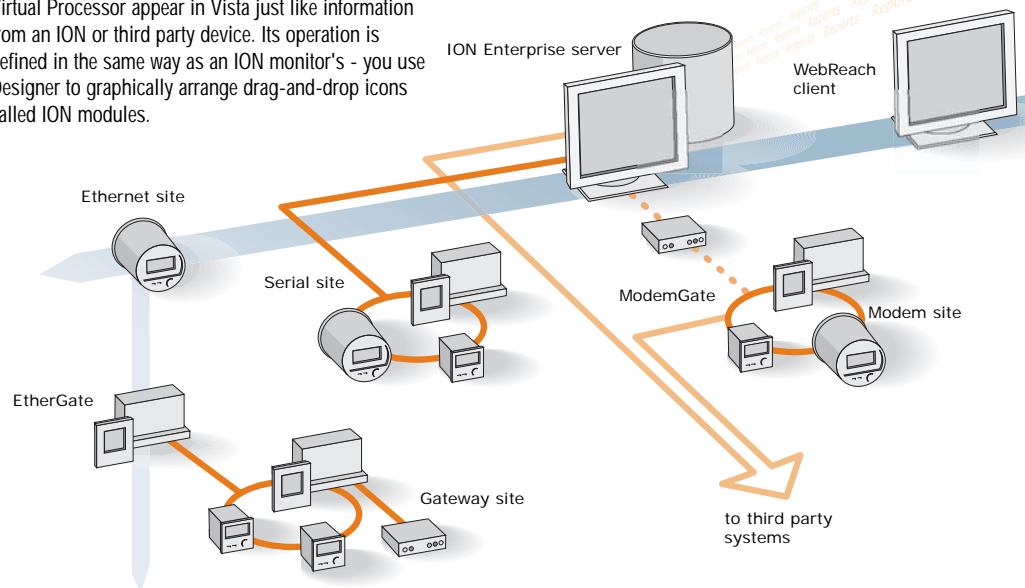
Logging Data from Devices

Use the Virtual ION Processor to log data from devices that don't have data recorders. For example, it can store a meter's total kWh values every 15 minutes.

Load Aggregation

A Virtual ION Processor can aggregate energy and power consumption readings from devices distributed across a facility or an entire nation, with results displayed in near real time.

All this information helps you negotiate volume pricing for power contracts or manage loads based on short-term electricity rates.



Modbus Master

ION Enterprise can act as Modbus master or slave. Master writes data to and stores data from any Modbus slave device via the server's serial or Ethernet ports. The slave can respond to requests from a master and transmit power system information through the serial port.

Reporter: for Data Analysis

Reporter automatically interprets and analyzes information from the ION Enterprise database or any other ODBC-compliant database.

Reports can follow a timetable, respond to system events, or be manually-driven.

You have options for automatically printing the reports, storing them to a folder, distributing them by email, or saving them in HTML web-ready format.

Because the ION Enterprise database is ODBC-compliant, you can also use reporting tools from other vendors. Plus, through data warehousing, you can combine ION Enterprise data with other databases across your enterprise to develop a clear picture of business conditions. Develop simulations to forecast the results of changes to operational processes or expenditures like substations.

Standard Reports

Four standard reports are generated in Microsoft® Excel™ format: aggregate energy and demand, load profile, EN50160 compliance monitoring and power quality. They help you:

- ♦ Allocate costs to individual areas and identify expensive processes that need attention
- ♦ Compile historic trending data to load circuits at higher levels and run systems near rated tolerances
- ♦ Create models of daily electricity usage so you can distribute loads and avoid demand peaks
- ♦ Consolidate billing for services received across multiple feeds
- ♦ Verify your power system's compliance with EN50160 power quality standards
- ♦ Analyze power quality to identify disturbance sources and take corrective actions
- ♦ Verify power quality for contracts between energy suppliers and consumers

To produce a standard report, just specify the data to be retrieved and distribution method.

Graphs and tables update every time the report is generated. Select any tab at the bottom of a report's summary page for further details.

Aggregate Energy and Demand Reports

Provide analyses and cost breakdowns of your system's power and energy consumption over the requested intervals. Information includes: tariff names and monetary values; calculated costs for each tariff period; and the kWh, kVARh, and kVAh values for each tariff.

Aggregate Load Profile Reports

Contain data and graphs about the power usage of your system over the specified date range. Timestamps and peak power usage are shown.

Power Quality Reports

Include charts displaying line disturbances and list all incidents with timestamps and related details. Click on any event's timestamp to view more information.

EN50160 Reports

Use the EN50160 compliance monitoring scheme to quickly assess your system's power quality levels. Flicker data is provided.

Custom Reports

You can set up custom reports using Visual Basic® for Applications. Any of these reports can be further analyzed through Excel's mathematical and graphical functions.

You can also create reports with other tools. Simply set up "report views" using the Report View Manager. Create one report view for each data log and assign custom names to the views.

Power Measurement Technical Service also offers a custom report generation service.

Vista: Monitoring Your Power System

Vista gives you desktop access to all your power system information.

Every user can set up unique views with time-saving graphical displays. People in various departments — accounting, customer service, and engineering — can simultaneously review the information they need.

Take Advantage Of Default Views

Speed up your system configuration with default displays. Immediate access to all meters is just a few mouse clicks away with the "Generate Network Diagram" option.

Power Quality Displays

Overlay waveforms to correlate phase-to-phase relationships between voltages and currents and cascading failures. View several seconds of consecutive waveforms using cursor control and zoom options. Plot transients, surges, and sags on ITI (CBEMA) curves. Display odd/even harmonics, THD, K-factor, crest factor, vector diagrams, and symmetrical components.

Customize Your Backgrounds

Select any one-line diagrams, photos, or maps that help you understand the power monitoring system.

Display Data The Way You Want

Represent any measurements as digital readouts, dials, or bar graphs. Adjust text labels to help you identify the source of data.

Receive Alarms At Your Desktop

Display alarm messages designed specifically for your task. Access more information with a simple point and click. Receive alarms via pager or email even when you're not logged on to ION Enterprise. Meters can immediately alert ION Enterprise without waiting for system polls.

Perform Manual Control Operations

Click on trigger buttons to control breakers, switches, and other devices.

Create Your Own Database Queries

Use the Query Wizard to extract information from the ION Enterprise database.

Check Status Indicators

You can display the current status of any device. See a transformer change color to indicate over-temperature. Watch a switch change when you press a trigger button.

Generate Trend Graphs

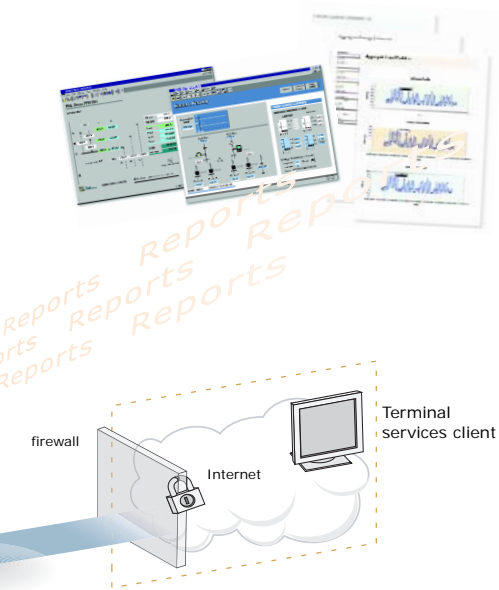
Interpret data using analyses that are easy to understand at a glance.

Drill Down into "Hot Spots"

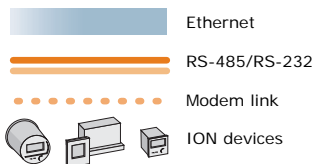
Click into deeper layers of detail. For example, start with an aerial view of your site, click into a substation, and select a feeder to produce a disturbance analysis.

Set Up Grouping Windows

You can group all relevant trigger buttons, indicators, and measurements into one location and omit unnecessary information.



System Diagrams



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WebReach

WebReach can be used to access meter displays from the convenience of a web browser. You can create screens in Vista and display them in your web browser, including real-time numeric data, background graphics or diagrams, and views of event, data and waveform logs.

Scalability

ION Enterprise software offers easy, cost-effective, and fast system expansion. The system grows as your needs grow. Add one piece at a time, at your own pace, within your own budget.

Components are industry standard, so you can choose newer, faster, and lower-cost devices as they become available, while still maintaining your original investment.

This datasheet describes only a few of the capabilities that ION Enterprise offers. Some applications may require third party software or configuration assistance.

Contact Power Measurement or your local representative for an ION Enterprise demonstration.

Ordering Options

ION Enterprise software is available in packages designed to meet almost any system and budget. It can be licensed to support from as few as five to many hundreds of devices, and can present the information to as many users as you require.

Please refer to the product order form on our web site for complete ordering information.

Upgrades & Software Assurance

You can upgrade your existing ION Enterprise on a case-by-case basis or subscribe to our Software Assurance upgrade service. Please contact Power Measurement for complete details on all available upgrade packages and combinations.

Support Options

ION Enterprise support options ensure you maximize system performance and promptly receive product update information, with help desk support and software upgrades. Please contact Power Measurement for more information on available support packages.

Pre-Configured Computers

Power Measurement can pre-configure computers for you, so they come with Windows 2000 and ION Enterprise already installed. Servers, workstations, or laptops are specially chosen for optimal, reliable operation.

Meet the World Leader

Power Measurement is the leading provider of enterprise energy management systems for energy suppliers and consumers worldwide. Our ION® web-ready software and intelligent electronic devices comprise a complete, real-time information and control network that supports billing for complex energy contracts and helps improve power quality, reduce energy costs and keep operations running enterprise-wide, 24 hours a day. Our reputation for unparalleled value, quality and service is based on over two decades of innovation and experience.

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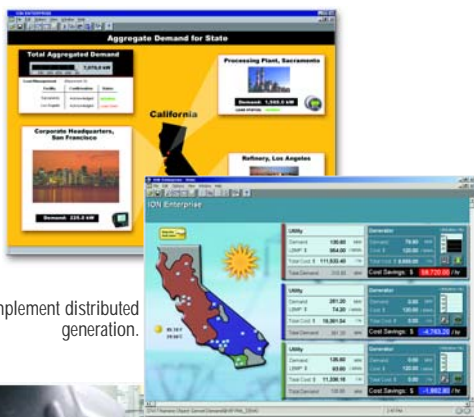
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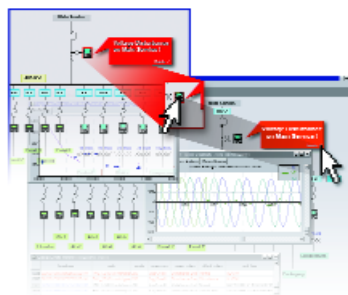
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Implement distributed generation.



- 1 Receive immediate warning of an alarm condition
- 2 Click on the alarm indicator to retrieve more details: time, location, and nature of event
- 3 Click again to study waveforms and ITI curves for a thorough power quality analysis

Aggregate energy and demand report provides detailed billing information

Load profile report shows detailed usage patterns

Power Quality report provides detailed disturbance analysis

Compliance Monitoring report displays compliance to EN 50160

YOUR LOCAL REPRESENTATIVE



Receive alarms via pager or email. Automatically control the operation of boilers, generators, or other equipment.

