



Intelligent Transmission & Distribution Grid Meters

The ION® 8800 meter is the world's most advanced energy meter, providing high accuracy and a wide range of valuable features for transmission and distribution metering.

This meter provides the necessary tools to manage energy procurement and supply contracts, perform network capacity planning and stability analysis, and monitor power quality compliance, supply agreements, and regulatory requirements.

Integrate with your existing wholesale settlement system, use ION Enterprise® and ION® EEM software, or share operations data with SCADA systems through multiple communication channels and protocols.

Patented ION® technology lets you define the exact metering or analysis functions you need for existing tariffs, supply agreements, and regulatory requirements, and it offers the flexibility to change as your needs change.

* Contact sales representative for availability

Applications Summary

Transmission & Distribution Metering

Use 4-quadrant metering features with IEC 62053-22 class 0,2S accuracy for metering at interconnection points on medium, high and ultra-high voltage networks. Feed collected data into existing systems and integrate with a wide variety of substation equipment. Use cost-effective Ethernet networks for easy, secure data access via email and web pages.

Compliance Monitoring

Monitor grid connections to independent power producers, other utilities, power stations and high voltage consumers. Monitor compliance with international quality-of-supply standards (e.g. EN 50160, IEC 61000-4-30, IEEE 1159).

Power Quality Analysis

Capture disturbances at key interconnection points using the digital fault recording feature. Correlate disturbances with substation equipment to pinpoint the cause of transients, harmonics and sags.

Load Management

Control equipment for load curtailment, for distributed generation strategies, and to verify compliance to special tariff agreements.

System Stability Monitoring

Determine sequence of events and cause-effect relationships throughout the network using GPS-synchronized event data.

Energy Pulsing and Totalization

Use digital pulsing inputs and outputs to cross-check or totalize meters, to collect and verify measurements from legacy meters, and to integrate to legacy metering systems.

Instrument Transformer Correction

Save money and improve accuracy using this feature to correct for less accurate transformers.

Transformer/Line Loss Compensation

Determine technical system losses in real time.

Feature Highlights

Multiple Tariffs & Time-Of-Use (TOU)

Multiple energy registers for TOU metering on virtually any tariff structure:

- ◆ Active, reactive, and apparent energy and demand
- ◆ Automatic recording of maximum (peak) demand during each tariff period
- ◆ Internal clock with < 5 ppm drift (battery backup)
- ◆ Automatic clock synchronization over communications channel or GPS
- ◆ 20-year calendar with automatic leap-year and seasonal time adjustments
- ◆ Time switch for tariff control per IEC 62056 and other international standards
- ◆ Three external digital tariff inputs
- ◆ TOU: Four seasons, five daily profiles per season, and four tariff periods per daily profile
- ◆ Automatic mid-season rate change support

Power Quality Compliance Monitoring

Measure statistical information defined in international quality-of-supply standards, plus specific data in localized and custom compliance agreements:

- ◆ EN 50160 and IEC 61000-4-30 compliance
- ◆ IEC 61000-4-7 harmonics and inter-harmonics
- ◆ IEC 61000-4-15 flicker
- ◆ CBEMA/ITIC, SARFI, etc.
- ◆ IEEE 1159

Communications

The meter can have multiple concurrent, independent ports in addition to the standard optical (IEC 1107) port. The field upgradeable communications module can include the following options:

- ◆ an RS-485 port
- ◆ a switchable RS-485/RS-232 port
- ◆ an internal PSTN modem with ModemGate
- ◆ an Ethernet port (RJ45 or fiber) with EtherGate

An ION 8800 with an Ethernet port boasts the following:

- ◆ MeterM@i!® automatically sends emails for alarms, scheduled status updates, and data log reports (XML and CSV formats)
- ◆ WebMeter® access to real-time values and PQ data in the on-board web server

Communicate to central telemetering and SCADA systems using multiple protocols: ION, DNP 3.0, Modbus RTU, DLMS (IEC 62056), IEC 61870-5-102*.



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Datasheet: ION® 8800

Metering

Energy

High-accuracy 4-quadrant metering in accordance with IEC 62053-22 class 0,2S for both 3- and 2-element systems:

- ♦ Real energy, bidirectional kWh (delivered & received)
- ♦ Reactive 4-quadrant energy, kvarh (positive & negative)
- ♦ Apparent energy kVAh (delivered & received)
- ♦ kWh, kvarh and kVAh net (delivered - received)
- ♦ kWh, kvarh and kVAh total (delivered + received)
- ♦ Any measured value, instantaneous voltage, current, etc.
- ♦ Fully programmable integrating period (1, 5, 10, 15, 30, 60 minutes or other)

Demand

Supports block, rolling block, thermal (exponential), and predicted demand calculations.

- ♦ kW, kvar and kVA demand, min/max
- ♦ Volts and Amps demand, min/max
- ♦ Cumulative demand
- ♦ Demand on any instantaneous measurement

Operational Measurements

Provides high-accuracy (1-second) and high-speed (1/2-cycle) true RMS 3-phase measurements for each phase and all phases:

- ♦ Voltage and current
- ♦ Active, reactive and apparent power
- ♦ Power factor and frequency
- ♦ Voltage / current unbalance / phase reversal
- ♦ Additional calculated and derived values

Loss Calculation & Error Correction

One second correction capabilities accurately establish system losses and correct for measurement errors in real time:

- ♦ Power transformer copper losses (I²) and iron losses (V) based on test method or loss constants
- ♦ Line loss calculations based on line impedance
- ♦ Instrument transformer correction using phase and ratio correction at multiple load levels
- ♦ Separate register to hold calculated loss and error-corrected values for active and reactive energy, in positive and negative directions

Accuracy and Approvals

The meter is independently certified by KEMA to meet the accuracy requirements of IEC 62053-22 Class 0,2S.

Front Panel Display & Security

Front Panel Display & Interface

- ♦ LCD backlit, alphanumeric text display for international labels (e.g. OBIS, VDEW, etc.)
- ♦ LEDs for power, alarming, and diagnostics
- ♦ IEC 1107 optical port for parameterization and data access by handheld or portable computer
- ♦ Multiple programmable screens, including numeric values, timestamped values, frequency spectrum (harmonics), event log, trend logs, and name plate data

Meter Security

- ♦ Control and customize data access for up to 16 users with security levels from read-only to administrative.
- ♦ Password protection on the meter's front panel and through the communications port
- ♦ Anti-tamper seal protection with sealing bars and chassis screws with through-holes

Monitoring

Digital Fault Recording

Simultaneous capture of voltage and current channels for sub-cycle disturbance transients as well as multi-cycle dips, swells and outages:

- ♦ From 16 to 1024 samples/cycle (800Hz to 51kHz)
- ♦ Sub-cycle disturbance capture to 20µs
- ♦ Up to 20 minutes of continuous disturbance recording (10MB memory and 800Hz sampling rate)
- ♦ Dynamic range: up to 1200 Vac, 70A peak

System Stability Monitoring

- ♦ Total harmonic distortion and individual to the 50th and beyond (magnitude, phase and inter-harmonics)
- ♦ Harmonic power flow
- ♦ Sags and swells at 10ms intervals, records depth and duration for CBEMA/ITIC curves, count dips and swells
- ♦ Sub-cycle (transient) detection to 20µs at 50Hz
- ♦ Symmetrical components (positive, negative and zero sequence) and phase angles for voltage and current
- ♦ Phase loss, rapid voltage change, over- and under-voltage detection

Call-back Function & Alarm Notification

- ♦ Alerts operators during outages and high priority events
- ♦ Dial-out capability when memory is near full
- ♦ Call back function for remote alarm notification
- ♦ Data push capability through SMTP (e-mail)

Installation/Connections

Environmental Specifications

- ♦ IEC62052-11

Installation

- ♦ IEC/DIN 43862 (19" rack) with Essaielc connectors
- ♦ Sealing capabilities
- ♦ Field replaceable communication options
- ♦ Field replaceable clock battery

Voltage Inputs

- ♦ Autoranging and direct connect: 57-288VAC L-N; 99-500VAC L-L; 1200VAC peak (L-N) fault capture

Current Inputs

- ♦ Low Current option: In = 1A, 2A; 6A max; 8.4A peak fault capture; 0.001A RMS starting current; 200A for 0,5 s
- ♦ High Current option: In = 5A; 10A max; 14A peak fault capture; 0.005A RMS starting current; 200A for 0,5 s

Power Supply

- ♦ Standard: polyphase power supply (meter powered by any one of the three phases) and single-phase auxiliary power
- ♦ AC: 85 to 240VAC (+/- 10%), 47 to 63Hz
- ♦ DC: 110 to 270VDC (+/- 10%)

Digital Inputs/Outputs

- ♦ 3 digital inputs: Hi-voltage range (80 - 280 VDC/AC); Lo-Voltage range (20 - 56 VDC)
- ♦ Upto 12 optically isolated digital outs, 24 Vdc - 210 Vac/dc
- ♦ Output fully programmable width down to 20ms
- ♦ Configurable relay contact for alarm signaling, energy pulsing and control

Nonvolatile Memory & Battery Back-up

- ♦ Non-volatile memory ensures configuration and measurement data is not lost during a power outage
- ♦ On-board clock supported by field-replaceable, long-life battery (min. 10 years with meter powered at 25 degrees Celsius). Battery replaceable while meter is powered.
- ♦ Flash memory firmware enables easy upgrade of features and configuration via communications

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 costs and keep operations running enterprise-wide.

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