

ION8800

Functions and characteristics

PE88176



PowerLogic™ ION8800 meter

Providing high accuracy and a wide range of features for transmission and distribution metering, the PowerLogic ION8800 advanced revenue and power quality meter has the flexibility to change along with your needs. The meter provides the tools necessary to:

- manage energy procurement and supply contracts
- perform network capacity planning and stability analysis
- monitor power quality compliance, supply agreements, and regulatory requirements.

Integrate the PowerLogic ION8800 meter with your existing wholesale settlement system, use PowerLogic ION Enterprise™ software, or share operations data with SCADA systems through multiple communication channels and protocols.

Applications

Transmission and distribution metering
Settlements, customer billing, cost allocation
Extensive power quality monitoring and analysis
Contract optimisation and compliance verification

Main characteristics

IEC 19-inch rack mount design to DIN 43862 standard

Use Essailec connectors with common measurement and energy pulsing pin-out to easily retrofit into existing systems.

Accurate metering

Interconnection points on medium, high, and ultra-high voltage networks are in compliance with IEC 62053-22/23 Class 0,2S.

Power quality compliance monitoring

Monitor compliance with international quality-of-supply standards (IEC 61000-4-30 Class A/S, EN50160, IEC 61000-4-7, IEC 61000-4-15, IEEE 1159, IEEE 519).

Power quality summary

Consolidate power quality characteristics into easily viewable reports indices.

Digital fault recording

Capture voltage and current channels simultaneously for sub-cycle disturbances.

Complete communications

Use the IEC1107 optical port or the optional communications module that supports concurrent Ethernet, serial, and modem communications.

Multiple tariffs and time-of-use

Apply tariffs and seasonal rate schedules to measure energy and demand values for time periods with specific billing requirements.

Alarms and I/O functions

Use up to 65 setpoints for single/multi-condition alarms and I/O functions with response times down to 1/2 cycle.

Alarm notification via email

High-priority alarms, data logs sent directly to the user's PC. Instant notification of power quality events by email.

Software integration

Easily integrate the meter with Struxureware Power Monitoring (ION Enterprise) or other utility software; MV-90, Pacis and third-party SCADA packages.

Transformer/line loss compensation

Compensate for system losses in real time directly in the meter.

Instrument transformer correction

Save money and improve accuracy by correcting for less accurate transformers.

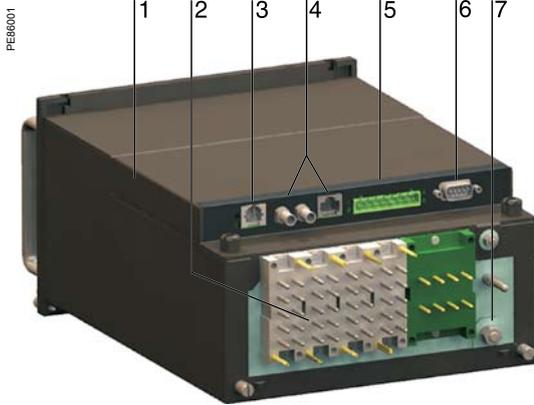
Part numbers⁽¹⁾

PowerLogic ION8800 meters	
PowerLogic ION8800A	M8800A
PowerLogic ION8800B	M8800B
PowerLogic ION8800C	M8800C

⁽¹⁾Representative part numbers only. See page 6 for complete part number descriptions.

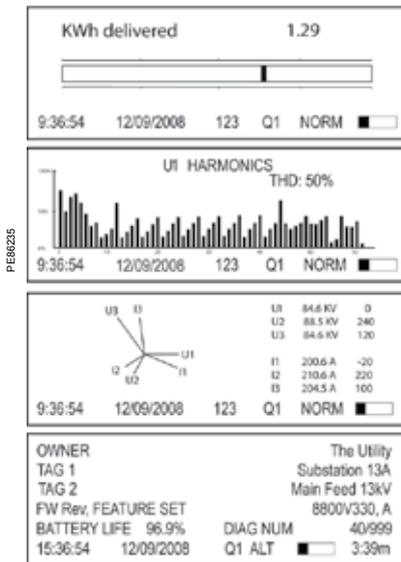
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PowerLogic ION8800 meter

- 1 Optional communications module.
- 2 Essaielc connectors.
- 3 Internal modem.
- 4 Optional Ethernet communications.
- 5 Selectable RS 485 serial port.
- 6 Selectable RS 232 or RS 485 serial port.
- 7 Ground terminal.



Display screen examples: KWh disk simulator, voltage harmonics histogram, phasor diagram, and name plate 1.

Selection guide	ION8800A	ION8800C
General		
Use on LV, MV and HV systems	■	■
Current accuracy	0.1 %	0.1 %
Voltage accuracy	0.1 %	0.1 %
Power accuracy	0.2 %	0.2 %
Samples/cycle	1024	1024
Instantaneous rms values		
Current, voltage, frequency (Class 0,2S)	■	■
Active, reactive, apparent power	Total and per phase	■
Power factor	Total and per phase	■
Current measurement range	0.001 - 10A	0.001 - 10A
Current measurement range	0.001 - 10A	0.001 - 10A
Energy values		
Active, reactive, apparent energy	■	■
Settable accumulation modes	■	■
Demand values		
Current	■	■
Active, reactive, apparent	■	■
Predicted active, reactive, apparent	■	■
Demand modes (block, sliding, thermal, predicted)	■	■
Power quality measurements		
Detection of voltage dips (sags) and swells	10 ms	10 ms
Symmetrical components: zero, positive, negative	■	-
Transient detection, microseconds (50 Hz)	20 ⁽¹⁾	20 ⁽¹⁾
Harmonics: individual, even, odd, total up to	63 rd	63 rd
Harmonics: magnitude, phase and inter-harmonics	50 th	40 th
EN 50160 compliance	■	■
IEC 61000-4-30 class A	■	■
IEC 61000-4-30 class S	■ ⁽²⁾	■
IEC 61000-4-15 (Flicker)	■	-
Configurable for IEEE 519 - 1992, IEEE 1159-1995	■ ⁽¹⁾	-
Programmable (logic and math functions)	■	■
Data recording		
Min/max logging for any parameter	■	■
Historical logs	Maximum # of records	800 ⁽¹⁾ 640 ⁽²⁾ 32
Waveform logs	Maximum # of records	96 ⁽¹⁾ -
Timestamp resolution in seconds	0.001	0.001
Setpoints, minimum response time	½ cycle	½ cycle
Number of setpoints	65	65
GPS time synchronisation (IRIG-B)	■	■
Could add transient logs. COMTRADE fault records.	■	■
User configurable log memory	10 Mbytes	10 Mbytes
Display and I/O		
Front panel display	■	■
Active/reactive energy pulser, LED and IEC 1107 style port	■	■
Digital pulse outputs, optional	Solid state Form A	8 8
Digital pulse outputs	Solid state Form C	4 4
Alarm relay output	Form C	1 1
Digital inputs (optional)	3	3
Communications		
RS 232/485 port	1	1
RS 485 port	1	1
Ethernet port	1	1
IEC 1107 optical port	1	1
Internal modem	1	1
3-port DNP 3.0 through serial, modem, Ethernet and I/R ports	■	■
Modbus RTU master / slave (serial, modem and I/R ports)	■ / ■	- / ■
Modbus TCP master / slave (via Ethernet port)	■ / ■	- / ■
Data transfer between Ethernet and RS 485 (EtherGate)	■	■
Data transfer between internal modem, RS 485 (ModemGate)	■	■
Alarms, single or multi-condition	■	■
Alarm notification & logged data via email	■	■
Embedded web server (WebMeter)	■	■

(1) ION8800A only.
 (2) ION8800B only.

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Functions and characteristics (cont.)



PowerLogic ION8800 with optional communications module.

Electrical characteristics

Type of measurement		True rms 1024 samples per cycle
Measurement accuracy	Current and voltage	0.1 %
	Power	0.2 %
	Frequency	±0.005 Hz
	Power factor	0.1%
	Energy	IEC 62053-22/23 Class 0.2 S
Data update rate		½ cycle or 1 second
Input-voltage characteristics	Inputs	U1, U2, U3, Uref
	Measurement range	57-288 LN VAC rms (99-500 LL VAC rms)
	Dielectric withstand	3320 VAC rms
	Impedance	5 MΩ /phase (phase-Uref/Ground)
Input-current characteristics	Rated nominals	5 A, 1 A, 2 A
	Permissible overload	200A rms for 0.5s, non-recurring (IEC 62053-22)
	Impedance	10 mΩ /phase
	Burden	0.01 VA per phase (1A), 0.25 VA per phase (5 A)
	Power supply	AC
	DC	110 - 270 VDC (+/- 10%)
	Burden	Typical (without comm module): 13 VA, 8 W Typical (with comm module): 19 VA, 12 W Max (without comm module): 24 VA, 10 W Max (with comm module): 32 VA, 14 W
	Ride-through time	Typical: 0.5 s to 5 s depending on configuration Min: 120 ms (6 cycles @ 50 Hz)
	Dielectric withstand	2000 VAC
Input/outputs	Mechanical alarm relay	1 Form C digital output (250 V AC / 125 V DC, 1 AAC / 0.1 A DC max)
	Digital outputs (Form C)	4 Solid state relay outputs (210 V AC / 250 V DC) 100 mAAC/DC
	Digital outputs (Form A)	8 Solid state relay outputs (210 V AC / 250 V DC) 100 mAAC/DC
	Digital inputs	3 Solid state digital inputs (low-voltage inputs 15 to 75 V AC/DC; high-voltage inputs 75 to 280 V AC/DC; 3 mA max.)
	Pulse rate	20 Hz maximum

Mechanical characteristics

Weight	6.0 kg (6.5 kg with optional communications module)
IP degree of protection (IEC 60529)	IP51
Dimensions	202.1 x 261.51 x 132.2 mm

Environmental conditions

Mounting location	Indoor
Maximum altitude	2000 m above sea level
Limit range of operation	-25°C to +70°C
Specified operating temperature	-10°C to +45°C (as per 62052-11)
Display operating range	-10°C to +60°C
Storage temperature	-25°C to +70°C
Humidity rating	5 to 95 % RH non-condensing
Pollution degree	2
Installation category	Power supply (II) Metering inputs (III)

Electromagnetic compatibility

Electrostatic discharge	IEC 61000-4-2
Immunity to radiated fields	IEC 61000-4-3
Immunity to fast transients	IEC 61000-4-4
Immunity to surge waves	IEC 61000-4-5
Conducted immunity	IEC 61000-4-6
Damped oscillatory waves immunity	IEC 61000-4-12
Conducted and radiated emissions	CISPR 22 (class B)

Safety

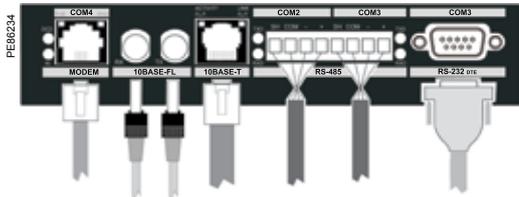
Europe	As per IEC 62052-11
International	As per IEC 60950

Utility approval

EGR, GOST, ESKOM, NMI

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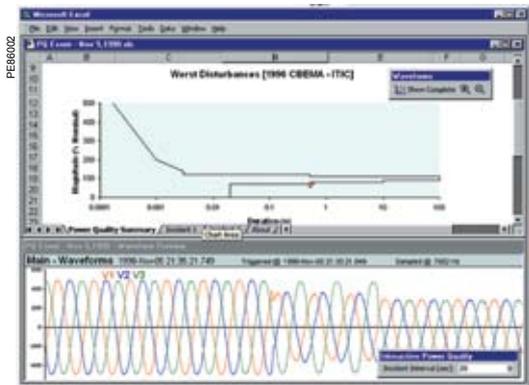
Functions and characteristics (cont.)



Ports on the optional communications module.



showing

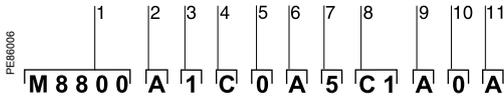


Sample power quality report.

Communication	
IEC 1107 optical port	2/4 wires, up to 19200 bauds
RS 485 port	Up to 57600 bauds, direct connection to a PC or modem, protocols: ION, Modbus RTU, Modbus Master, DNP 3.0, GPSTRUE/TIME/DATUM, DLMS
Communications module (optional)	
RS 232/485 port	300 - 115,200 bauds (RS 485 limited to 57,600 bauds); protocols: same as RS 485 port
Internal modem port	300 bauds - 56000 bauds, RJ11 connector
Ethernet port	10 BaseT, RJ45 connector, 100 m link; protocols: DNP TCP, ION, Modbus TCP, Modbus Master, IEC 61850
Fiber-optic Ethernet link	10 Base FL, ST connector, 1300 nm, FO multimode with gradient index 62.5/125 μm or 50/125 μm, 2000 m link; protocols: same as Ethernet port
EtherGate	Communicates directly with up to 62 slave devices via available serial ports
ModemGate	Communicates directly with up to 31 slave devices
Firmware characteristics	
High-speed data recording	Up to 1/2-cycle interval burst recording, stores detailed characteristics of disturbances or outages Trigger recording by a user-defined setpoint, or from external equipment.
Harmonic distortion	Up to 63 rd harmonic for all voltage and current inputs
Dip/swell detection	Analyse severity/potential impact of sags and swells: - magnitude and duration data suitable for plotting on voltage tolerance curves - per phase triggers for waveform recording or control operations
Instantaneous	High accuracy measurements with 1s or 1/2 cycle update rate for: - voltage and current - active power (kW) and reactive power (kvar) - apparent power (kVA) - power factor and frequency - voltage and current unbalance - phase reversal
Load profiling	Channel assignments (800 channels via 50 data recorders) are configurable for any measurable parameter, including historical trend recording of energy, demand, voltage, current, power quality, or any measured parameter Trigger recorders based on time interval, calendar schedule, alarm/event condition, or manually.
Modbus Master	Master up to 32 slave devices per serial channel and store their data at programmable intervals. Use this data to aggregate and sum energy values and perform complex totalization.
Waveform captures	Simultaneous capture of all voltage and current channels - sub-cycle disturbance capture - maximum cycles is 214,000 (16 samples/cycle x 96 cycles, 10 Mbytes memory) - 1024 samples/cycle
Alarms	Threshold alarms: - adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm - user-defined priority levels - boolean combination of alarms possible
Advanced security	Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user privileges.
Transformer correction	Correct for phase / magnitude inaccuracies in current transformers (CTs), potential transformers (PTs)
Memory	5 -10 Mbytes (specified at time of order)
Firmware update	Update via the communication ports
Display characteristics	
Type	FSTN transreflective LCD
Backlight	LED
Languages	English

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Functions and characteristics (cont.)



Example product part number.

- 1 Model.
- 2 Feature set.
- 3 Memory / form factor.
- 4 Current Inputs.
- 5 Voltage inputs.
- 6 Power supply.
- 7 System frequency.
- 8 Communications.
- 9 Onboard inputs/outputs.
- 10 Security.
- 11 Special order.

Part Numbers		
Item	Code	Description
1 Model	M8800	ION8800 IEC/DIN 43862 19" rack mount energy and power quality meter.
2 Feature Set	A	Class A power quality analysis, waveforms and transient capture with 1024 samples/cycle.
	B	Energy meter Class S EN50160 power quality monitoring.
	C	Basic tariff/energy revenue meter with sag/swell monitoring.
3 Memory/Form Factor	1	10 MB logging memory, Essailec connectors.
	2	5 MB logging memory, Essailec connectors, with IEC61850 protocol
4 Current Inputs	C	(I1-I3): Configured for 5 A nominal, 10 A full scale, 14 A fault capture, 0.001 A starting current.
	E	(I1-I3): Configured for 1 A nominal, 10 A full scale, 14 A fault capture, 0.001 A starting current.
5 Voltage Inputs	0	(V1-V3): Autoranging (57-288 VAC L-N or 99-500 VAC L-L)
6 Power Supply	B	Single phase power supply: 85-240 VAC ±10% (47-63 Hz) or 110-270 VDC.
7 System Frequency	5	Calibrated for 50 Hz systems.
	6	Calibrated for 60 Hz systems.
8 Communications module (field serviceable)	Z0	No communications module - meter includes Base Onboard I/O and comms (see below for details).
	A0	Standard communications: 1 RS 232/RS 485 port, 1 RS 485 port (COM2) ⁽¹⁾ .
	C1	Standard communications plus 10Base-T Ethernet (RJ45), 56 k universal internal modem (RJ11).
	D1	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL Ethernet Fiber, 56 k universal internal modem (RJ11).
	E0	Standard communications plus 10Base-T Ethernet (RJ45).
	F0	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL (ST male Fiber Optic connection).
9 Onboard I/O and communications (not field serviceable, part of base unit)	M1	Standard communications plus 56k universal internal modem (RJ11).
	A	Base option AND 8 Form A digital outputs ⁽²⁾ , 1 RS-485 (COM2) port ⁽¹⁾ .
	B	Base Option AND 8 Form A digital outputs ⁽²⁾ , 3 digital inputs (20-56 VDC/AC).
	C	Base Option AND 8 Form A digital outputs ⁽²⁾ , 3 digital inputs (80-280 VDC/AC).
	D	Base Option AND 1 IRIG-B time sync port ⁽²⁾ , 1 RS-485 port (COM2), 3 digital inputs (20-56 V DC/AC) ⁽¹⁾ .
10 Security	E	Base Option AND 1 IRIG-B time sync port ⁽²⁾ , 1 RS-485 port (COM2), 3 digital inputs (80-280 V DC/AC) ⁽¹⁾ .
	0	Password protected, no security lock.
11 Special Order	1	Password protected with security lock enabled.
	A	None.
	C	Tropicalisation treatment applied.

Related products	
RACK-8800-RAW	IEC/DIN 34862 19" Rack with female mating voltage/current and I/O blocks unassembled.
IEC-OPTICAL-PROBE	Optional IEC 1107 compliant Optical Probe for use with ION8800 meters.
BATT-REPLACE-8XXX	Replacement batteries for the ION8600 or ION8800, quantity 10.
ION-SETUP	Free configuration software for the ION8800. Ships on a CD.

(1) Channel COM2 is available on the port at the back of the meter OR on the Comm Module (if installed). You must select which connectors your communications wiring is connected to during meter setup.

(2) All Onboard I/O and Comms (Base Option) options include: 4 Form C solid-state digital outputs, 1 Form C mechanical relay output, one IEC 1107 optical communications port, two IEC 1107 style optical pulsing ports.



Optional ION8800 communications module.

Part Numbers (cont.)

ION8800 communications module for field retrofit installations

Item	Code	Description
P880C	A0	Standard communications: 1 RS-232/RS-485 port, 1 RS-485 port (COM2) ⁽¹⁾ .
	C1	Standard communications plus 10Base-T Ethernet (RJ45), 56k universal internal modem (RJ11).
	D1	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL Ethernet Fiber, 56k universal internal modem (RJ11).
	E0	Standard communications plus 10Base-T Ethernet (RJ45).
	F0	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL Ethernet Fiber (ST male Fiber optic connection).
	M1	Standard communications plus 56k universal internal modem (RJ11).
Special Order	A	None.
	C	Tropicalisation treatment applied.

(1) Channel COM2 is available on the port at the back of the meter OR on the Comm Module (if installed). You must select which connectors your communications wiring is connected to during meter setup.

Note: The part number above should conform to the following format: P880C A0 A.