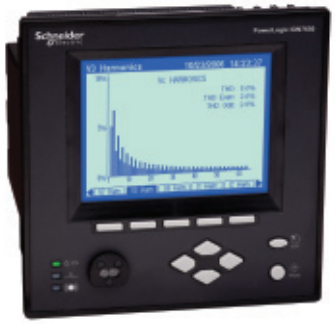
ION7550 / ION7650
Functions and characteristics

PE86126



PowerLogic ION 7650.

Used at key distribution points and sensitive loads, ION7550 and ION7650 meters offer unmatched functionality including advanced power quality analysis coupled with revenue accuracy, multiple communications options, web compatibility, and control capabilities. Integrate these meters with PowerLogic® ION Enterprise software or share operations data with existing SCADA systems through multiple communication channels and protocols.

Applications

Reduce energy costs.
Increase equipment utilisation.
Comply with environmental and regulatory requirements.
Improve power quality and reliability.
Improve customer satisfaction and retention.
Monitor and control equipment.
Integrated utility metering.
Allocate or sub-bill energy costs to departments, processes or tenants.

Main characteristics

Anticipate, diagnose and verify to increase efficiency
Reveal energy inefficiencies or waste and optimise equipment operation to increase efficiency. Isolate reliability risks, diagnose power-related equipment issues and verify reliable operation.

Summarise power quality, set targets, measure and verify results
Consolidate all the power quality characteristics into a single trendable index. Benchmark power quality and reliability and compare against standards, or compare facilities or processes.

Easy to use, multilingual, IEC/IEEE configureable display
Bright LCD display with adjustable contrast. Screen-based menu system to configure meter settings including IEC or IEEE notations. Multilingual support for English, French, Spanish and Russian. 12/24 hour clock support in multiple formats.

Modbus Master functionality
Read information from downstream Modbus devices and view it via the front panel or store in memory until you upload to the system level.

Gateway functionality
Access through the meter's Ethernet port (EtherGate) or telephone network (ModemGate) to Modbus communicating devices connected to meter serial ports.

Detect and capture short transients as short as 20µs at 50Hz (17µs at 60 Hz)
Identify problems due to short disturbances, e.g. switching of capacitors, etc.

Power quality compliance monitoring
Monitor compliance with international quality-of-supply standards (IEC 61000-4-30 class A[1], EN50160[1], IEC 61000-4-7, IEC 61000-4-15, IEEE 519, IEEE 1159, and CBEMA/ITIC). Evaluate flicker based on IEC 61000-4-15 and IEEE 1453.

Detect major waveform changes
Detection of phase switching phenomena (for example during the transfer of a high-speed static switch) not detected by classical threshold-based alarms.

Record ultra-fast electrical parameters every 100 ms or every cycle
Preventive maintenance: acquisition of a motor startup curve, etc.

Trend curves and short-term forecasting
Rapid trending and forecasting of upcoming values for better decision making.

Disturbance direction detection
Determine disturbance location and direction relative to the meter. Results captured in the event log, along with a timestamp and certainty level.

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

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

[1] ION7650 only

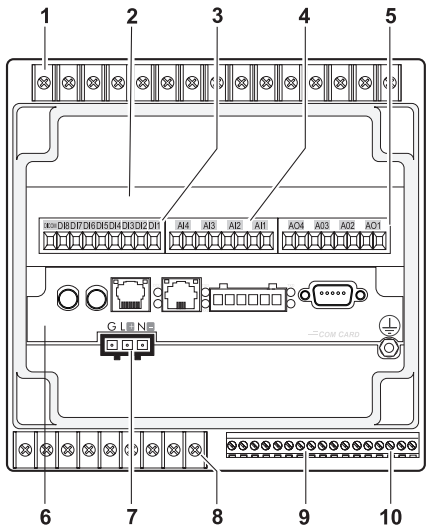
Part numbers

ION7550 / ION7650	
ION7550	**M7550**
ION7650	**M7650**

See page 78 for order code explanations.

ION7550 / ION7650
Functions and characteristics (cont.)

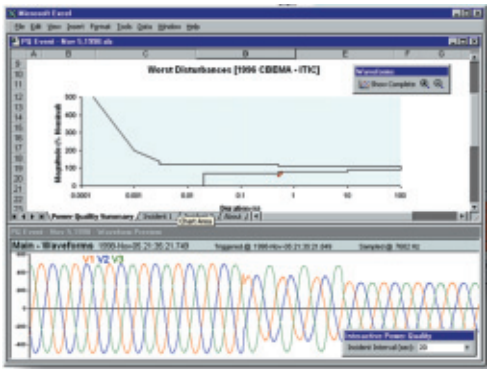
PE86018



PowerLogic® ION7550 / ION7650.

1 *Current/voltage inputs.*
2 *I/O expansion card.*
3 *Digital inputs.*
4 *Analog inputs.*
5 *Analog outputs.*
6 *Communications card.*
7 *Power supply.*
8 *Form C digital outputs.*
9 *Digital inputs.*
10 *Form A digital outputs.*

PE86002



Disturbance waveform capture and power quality report

Selection guide		ION7550	ION7650
General			
Use on LV and HV systems		■	■
Current accuracy (1A to 5A)		0.1 % reading	0.1 % reading
Voltage accuracy (57V to 288V)		0.1 % reading	0.1 % reading
Energy accuracy		0.2 %	0.2 %
Nbr of samples/cycle or sample frequency		256	1024
Instantaneous rms values			
Current, voltage, frequency		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Current measurement range (autoranging)		0.01 - 20A	0.01 - 20A
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current	Present and max. values	■	■
Active, reactive, apparent power	Present and max. values	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Setting of calculation mode	Block, sliding	■	■
Power quality measurements			
Harmonic distortion	Current and voltage	■	■
Individual harmonics	Via front panel	63	63
	Via ION Enterprise	127	511
Waveform capture		■	■
Detection of voltage swells and sags		■	■
Detection and capture of transients		-	20 µs(1)
Flicker		-	■
Fast acquisition of 100 ms or 20 ms data		■	■
EN50160 compliance checking		-	■
Programmable (logic and math functions)		■	■
Data recording			
Min/max of instantaneous values		■	■
Data logs		■	■
Event logs		■	■
Trending/forecasting		■	■
SER (Sequence of event recording)		■	■
Time stamping		■	■
GPS synchronisation (1 ms)		■	■
Memory (in Mbytes)		10	10
Display and I/O			
Front panel display		■	■
Wiring self-test		■	■
Pulse output		1	1
Digital or analogue inputs(max)		20	20
Digital or analogue outputs (max, including pulse output)		12	12
Communication			
RS 485 port		1	1
RS 485 / RS 232 port		1	1
Optical port		1	1
Modbus protocol		■	■
Ethernet port (Modbus/TCP/IP protocol)		1	1
Ethernet gateway (EtherGate)		1	1
Alarms (optional automatic alarm setting		■	■
Alarm notification via email (Meterm@il)		■	■
HTML web page server (WebMeter)		■	■
Internal modem		1	1
Modem gateway (ModemGate)		■	■
DNP 3.0 through serial, modem, and I/R ports		■	■

(1) *For 50 Hz line frequency; 17µs for 60 Hz line frequency.*

ION7550 / ION7650
Functions and characteristics (cont.)

PE86126

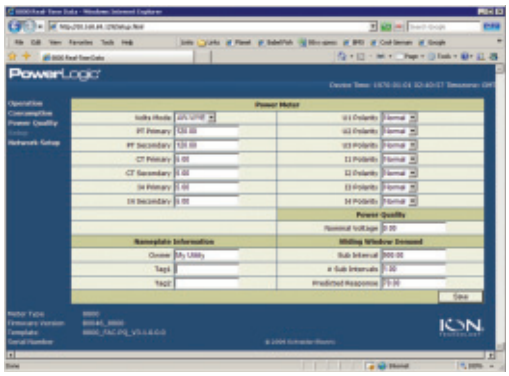
PowerLogic ION7650

Electrical characteristics		
Type of measurement		True rms to 1024 samples per cycle (ION7650)
Measurement accuracy	Current and voltage	±0.01% of reading + ±0.025% of full scale
	Power	±0.075% of reading + ±0.025% of full scale
	Frequency	±0.005Hz
	Power factor	±0.002 from 0.5 leading to 0.5 lagging
	Energy:	IEC62053-22 0,2S, 1A and 5A
Data update rate		1/2 cycle or 1 second
Input-voltage characteristics	Measured voltage	Autoranging 57V through 347V LN / 600V LL
	Measurement range	85 to 240VAC and 110 to 330VDC
	Impedance	5 MΩ/phase (phase - Vref)
	Frequency measurement range	47 to 63Hz
Input-current characteristics	Rated nominal current	1A, 2A, 5A, 10A
	Measurement range	0.005 - 20 A autoranging (standard range) 0.001 - 10 A autoranging (optional range)
	Permissible overload	500 A rms for 1 s, non-recurring (at 5A) 200 A rms for 1s, non-recurring (at 1A)
	Impedance	0.002 Ω per phase (5A) 0.015 Ω per phase (1A)
	Burden	0.05 VA per phase (at 5 A) 0.015 VA per phase (at 1 A)
Power supply	AC	85-240 V AC ±10% (47-63 Hz)
	DC	110-300 V DC ±10%
	DC low voltage (optional)	20-60 V DC ±10%
	Ride-through time	100 ms (6 cycles at 60 Hz) min. at 120 V DC
	Burden	Standard: typical 15 VA, max 35 VA Low voltage DC: typical 12 VA, max 18 VA
Input/outputs(1)	Standard	8 digital inputs (120 V DC) 3 relay outputs (250 V AC / 30 V DC) 4 digital outputs (solid state)
	Optional	8 additional digital inputs 4 analog outputs, and/or 4 analog inputs
Mechanical characteristics		
Weight		1.9 kg
IP degree of protection (IEC 60529)		Integrated display, front: IP 50; back: IP 30 Transducer unit (no display): IP 30
Dimensions	Standard model	192 x 192 x 159 mm
	TRAN model	235.5 x 216.3 x 133.1 mm
Environmental conditions		
Operating temperature	Standard power supply	-20 to +70ºC
	Low voltage DC supply	-20 to +50ºC
	Display operating range	-20 to +70ºC
Storage temperature	Display, TRAN	-40 to +85ºC
Humidity rating		5 to 95% non-condensing
Installation category		III (2000m above sea level)
Dielectric withstand		As per EN 61010-1, IEC 62051-22A(2)
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 surges		IEC 61000-4-5
Conducted and radiated emissions		CISPR 22
Safety		
Europe		IEC 61010-1

(1) *Consult the ION7550 / ION7650 installation guide for complete specifications.*
(2) *IEC 62051-22B with serial ports only.*

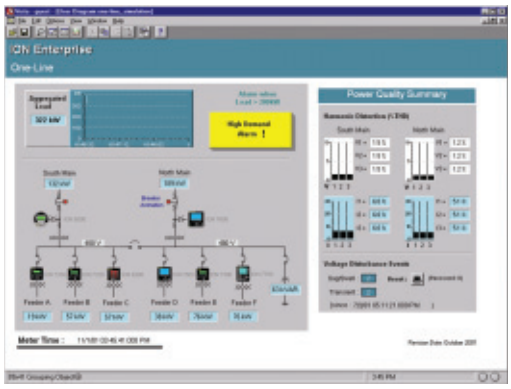
ION7550 / ION7650
Functions and characteristics (cont.)

PE86004



Example WebMeter page showing realtime values.

PE86005

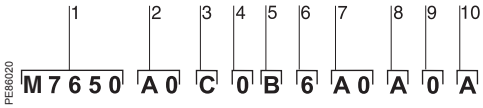


Example showing instantaneous values and alarm.

Communication	
RS 232/485 port (1)	Up to 115,200 bauds (57,600 bauds for RS 485), ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master
RS 485 port (1)	Up to 57,600 bauds, ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master
Infrared port(1)	ANSI type 2, up to 19,200 bauds, ION, Modbus, DNP 3.0
Ethernet port	10Base-T/100Base-TX, RJ45 connector, 100 m link
Fibre-optic Ethernet link	100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link
Protocol	ION, Modbus, TCP/IP, DNP 3.0, Telnet
EtherGate	Communicates directly with up to 62 slave devices via available serial ports
ModemGate	Communicates directly with up to 31 slave devices
WebMeter	5 customisable pages, new page creation capabilities, HTML/XML compatible
Firmware characteristics	
High-speed data recording	Down to 5ms 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 63rd harmonic (511th for ION7650 via ION Enterprise software) for all voltage and current inputs
Sag/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, control
Disturbance direction detection	Determine the location of a disturbance more quickly and accurately by determining the direction of the disturbance relative to the meter. Analysis results are captured in the event log, along with a timestamp and confidence level indicating level of certainty.
Instantaneous	High accuracy (1s) or high-speed (1/2 cycle) measurements, including true rms per phase / total 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) 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.
Trend curves	Access historical data at the front panel. Display, trend and continuously update historical data with date and timestamps for up to four parameters simultaneously.
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, 10Mbytes memory) - 256 samples/cycle (ION7550) - 512 samples/cycle standard, 1024 samples/cycle optional (ION7650)
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 is possible using the operators NAND, OR, NOR and XOR
Advanced security	Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations on user privileges
Transformer correction	Correct for phase / magnitude inaccuracies in current transformers (CTs), potential transformers (PTs)
Memory	5 to 10 Mbytes (specified at time of order)
Firmware update	Update via the communication ports
Display characteristics	
Integrated display	Back lit LCD, configurable screens
Languages	English, French, Spanish, Russian
Notations	IEC, IEEE

***(1)** All the communication ports may be used simultaneously.*

ION7550 / ION7650
Functions and characteristics (cont.)



Example ION7650 product part number.

1 *Model.*
2 *Form factor.*
3 *Current Inputs.*
4 *Voltage Inputs.*
5 *Power supply.*
6 *System frequency.*
7 *Communications.*
8 *Inputs/outputs.*
9 *Security.*
10 *Special order.*

Part numbers

	Item	Code	Description
1	Model	M7650	Advanced m eter with wide-range voltage inputs (57-347V line-neutral or 100-600V line-line), transient detection, data and waveform recording. Supports ION, Modbus-RTU, and DNP 3.0.
		M7550	Advanced meter with wide-range voltage inputs (57-347V line-neutral or 100-600V line-line), sag/swell detection, data and waveform recording, and 256 samples/cycle resolution.
2	Form Factor	A0	Integrated display with front optical port, 5 MB logging memory, and 512 samples/cycle resolution.
		A1	*ION7650 only.* Integrated display with front optical port, 5 MB logging memory, and 1024 samples/cycle resolution.
		B0	Integrated display with front optical port, 10 MB logging memory, and 512 samples/cycle resolution.
		B1	*ION7650 only.* Integrated display with front optical port, 10 MB logging memory, and 1024 samples/cycle resolution.
		T0	Transducer (no display) version, with 5 MB logging memory, and 512 samples/cycle resolution.
		T1	*ION7650 only.* Transducer (no display) version, with 5 MB logging memory, and 1024 samples/cycle resolution.
		U0	Transducer (no display) version, with 10 MB logging memory, and 512 samples/cycle resolution.
		U1	*ION7650 only.* Transducer (no display) version, with 10 MB logging memory, and 1024 samples/cycle resolution.
3	Current Inputs	C	5 Amp nominal, 20 Amp full scale current input
		E	1 Amp nominal, 10 Amp full scale current input
		F	Current Probe Inputs (for 0-1 VAC current probes; sold separately)
		G	Current Probe Inputs with three Universal Technic 10A clamp on CTs; meets IEC 1036 accuracy
4	Voltage Inputs	0	57 to 347 VAC line-to-neutral / 100 to 600 VAC line-to-line
5	Power Supply	B	Standard power supply (85-240 VAC, ±10%/47-63 Hz / 110-330 VDC, ±10%)
		C	Low voltage DC power supply (20-60 VDC)
6	System Frequency	5	Calibrated for 50 Hz systems
		6	Calibrated for 60 Hz systems
7	Communications	A0	Standard communications (1 RS-232/RS-485 port, 1 RS-485 port). Integrated display models include 1 ANSI Type 2 optical port.
		C1	Standard communications plus 10Base-T/100Base-TX Ethernet (RJ45), 56k universal internal modem (RJ11). Ethernet and modem gateway functions each use a serial communications port.
		D7	Standard communications plus 10Base-T/100Base-TX Ethernet (RJ45) and 100BaseFX Ethernet Fiber, 56k universal internal modem (RJ11). Ethernet/modem gateway uses serial port.
		E0	Standard communications plus 10Base-T/100Base-TX (RJ45). Ethernet gateway function uses a serial communications port.
		F1	Standard communications plus 10Base-T/100Base-TX Ethernet (RJ45) and 100Base-FX (SC male Fiber Optic connection). Ethernet gateway function uses a serial port.
		M1	Standard communications plus 56k universal internal modem (RJ11). Modem gateway function uses a serial port.
8	I/O	A	Standard I/O (8 digital ins, 3 Form C relays, 4 Form A solid-state out)
		D	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 1 mA analog inputs)
		E	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog inputs)
		H	Standard I/O plus Expansion I/O card (8 additional digital inputs & four -1 to 1 mA analog outputs)
		K	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog outputs)
		N	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog inputs and four 0 to 20 mA outputs)
		P	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 1 analog inputs and four -1 to 1 mA analog outputs)
9	Security	0	Password protected, no hardware lock
		1	Password protected, hardware lockable (enabled/disabled via jumper on comm card)
		6	Password protected with security lock enabled, terminal cover and UK OFGEM labels

ION7650 / ION7550
Functions and characteristics (cont.)

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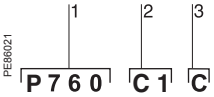
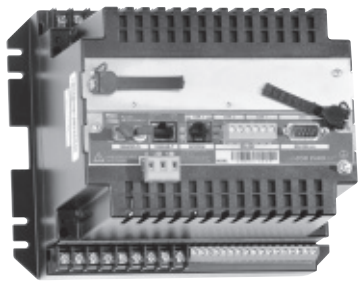


Example order code. Use this group of codes when ordering the ION7550/7650 communications or I/O cards.

1 *Communications or I/O card.*
2 *Type*
3 *Special order.*

PE86019



PowerLogic ION7550 TRAN

Part numbers (cont'd)

	Item	Code	Description
10	Special Order	A	None
		C	Tropicalisation treatment applied
		E	ION7650 only. EN50160 compliance monitoring, no tropicalisation treatment
		F	ION7650 only. EN50160 compliance monitoring, with tropicalisation treatment

Communications Card (1)

	Item	Code	Description
1	Comm card	P765C	ION7550 / ION7650 communication card for field retrofit installations
2	Type	A0	Standard communications (1 RS-232/RS-485 port, 1 RS-485 port). Front optical port support for meters with integrated display.
		C1	Standard communications plus 10Base-T/100Base-TX Ethernet (RJ45), 56k universal internal modem (RJ11; the modem port is shared with the front optical port). Ethernet and modem gateway functions each use a serial communications port.
		D7	Standard communications plus 10Base-T/100Base-TX Ethernet, 100BaseFX Ethernet Fiber, 56k universal internal modem (RJ11; the modem port is shared with the front optical port). Ethernet and modem gateway functions each use a serial communications port.
		E0	Standard communications plus 10Base-T/100Base-TX Ethernet. Ethernet gateway function uses a serial communications port.
		F1	Standard communications plus 10Base-T/100Base-TX Ethernet, 100BaseFX Ethernet Fiber (SC male Fiber Optic connection). Ethernet gateway function uses a serial communications port.
		M1	Standard communications plus 56k universal internal modem (RJ11; the modem port is shared with the front optical port). Modem gateway function uses a serial communications port.
3	Special order	A	None
		C	Tropicalization treatment applied

Input/Output expansion card

Item	Code	Description
I/O card	P760A	Expansion I/O for field retrofit installations.
Type	D	Expansion I/O card with eight digital inputs, four 0 to 1 mA analog inputs
	E	Expansion I/O card with eight digital inputs, four 0 to 20 mA analog inputs
	H	Expansion I/O card with eight digital inputs, four -1 to 1 mA analog outputs
	K	Expansion I/O card with eight digital inputs, four 0 to 20 mA analog outputs
	N	Expansion I/O card with eight digital inputs, four 0 to 20 mA analog inputs & four 0 to 20 mA outputs
	P	Expansion I/O card with eight digital inputs, four 0 to 1 analog inputs and four -1 to 1 mA analog outputs
Special Order	A	None
	C	Tropicalization treatment applied

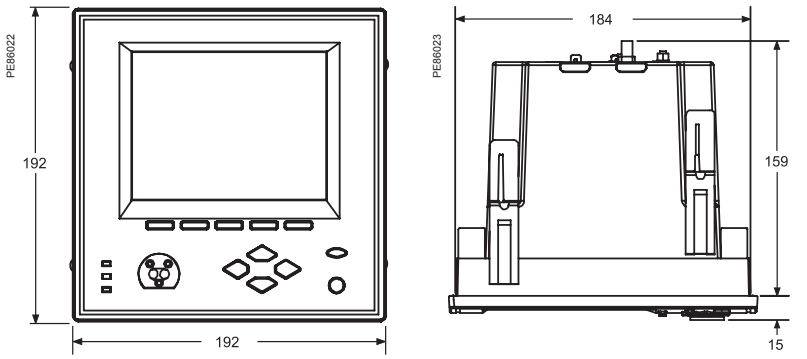
ION7550 / ION7650 related items

Code	Description
ADPT-37XX-7500	Adapter plate to fit meter into a 3710 or 3720 ACM panel cutout
TERMCVR-7500	Terminal strip cover for the ION7550 or ION7650
M1UB10A1V-10A	10 A / 1 VAC Universal Technic Clamp On Current Probe
P32UEP813-1000A	1000 A / 1 VAC Universal Technic Clamp On Current Probe
P32UEP815-3000A	3000 A / 1 VAC Universal Technic Clamp On Current Probe
SCT0750-005-5A	5 A / 0.333 VAC Magnelabs Split Core Current Probe
SCT1250-300-300A	300 A / 0.333 VAC Magnelabs Split Core Current Probe

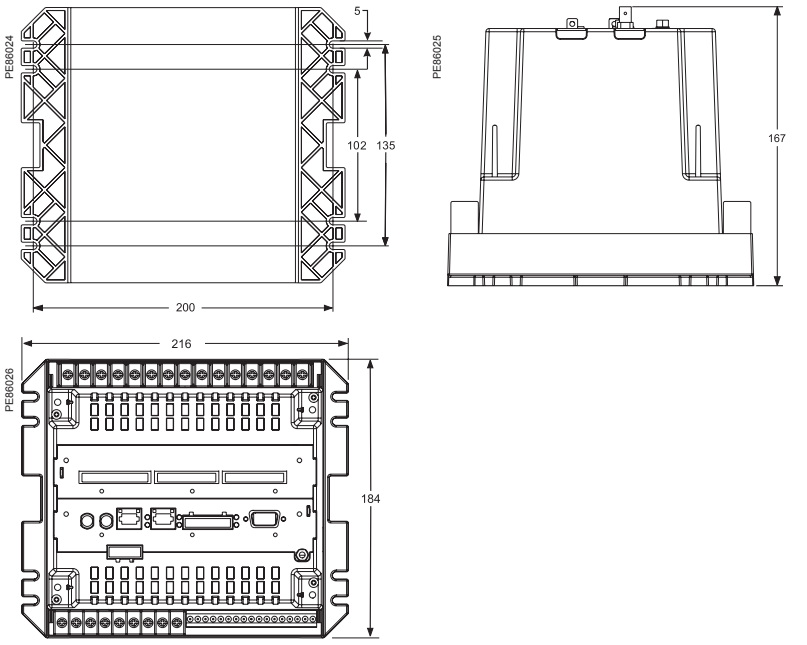
(1) *Firmware version 350 or higher required.*

ION7550 / ION7650
Installation and connection

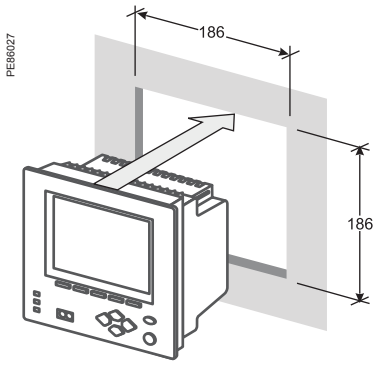
ION7550/ION7650 dimensions



ION7550 / ION7650 TRAN dimensions

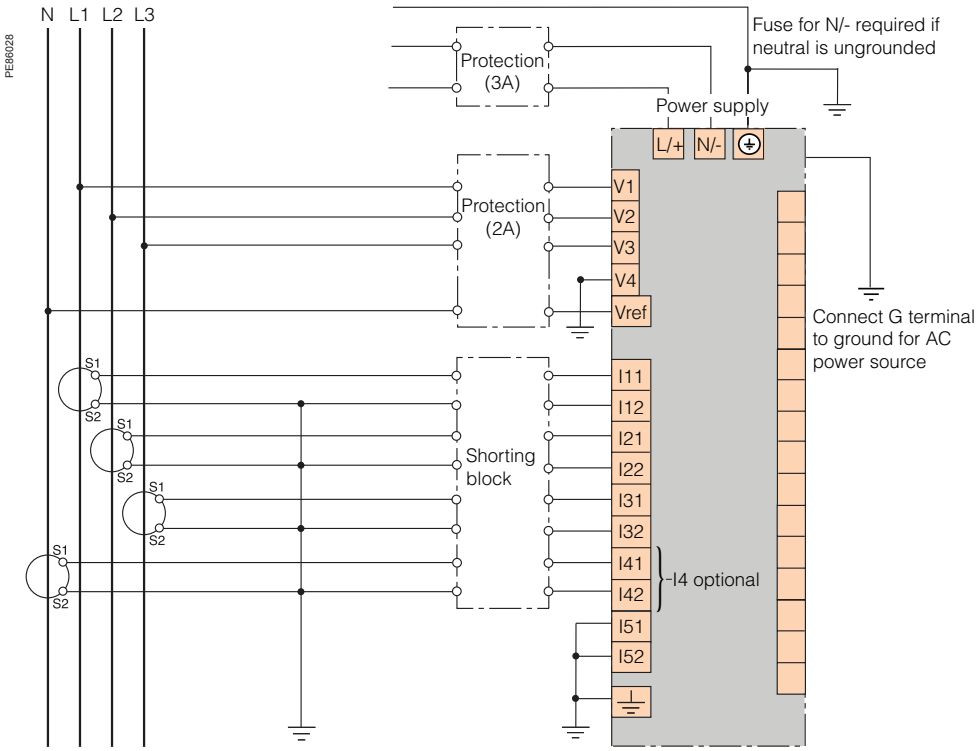


Front-panel mounting



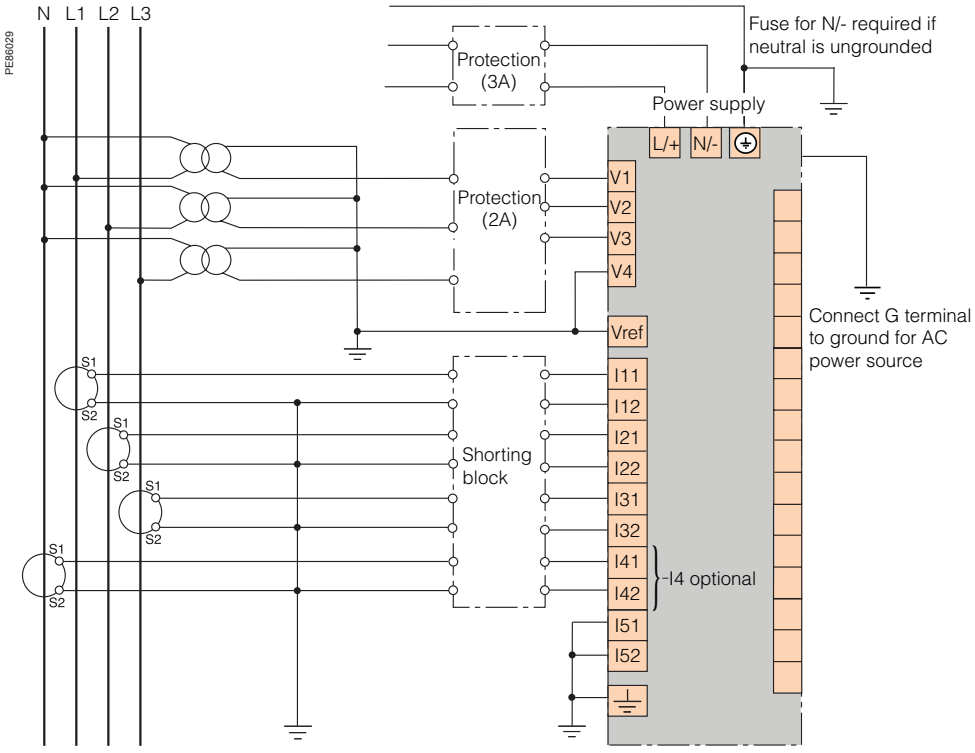
ION7550 / ION7650
Installation and connection (cont.)

4-wire direct connections



Connection representation only. Other types of connection are possible. See product installation guide for complete wiring and communication connection details.

4-wire 3 element connection with 4 CTs and 3 PT

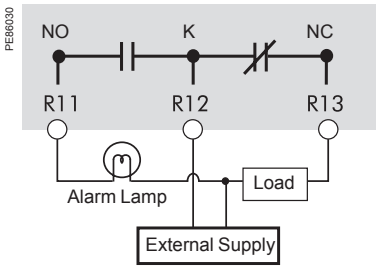


Connection representation only. Other types of connection are possible. See product installation guide for complete wiring and communication connection details.

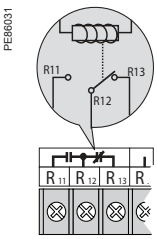
ION7550 / ION7650
Installation and connection (cont.)

Form C digital outputs: mechanical relays R1 - R3

ION7550 / ION7650



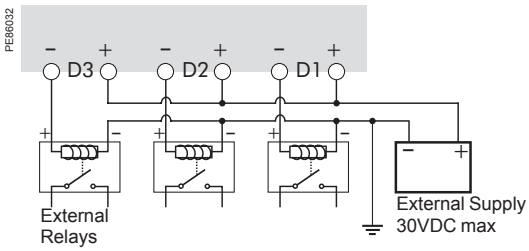
Form C Relay



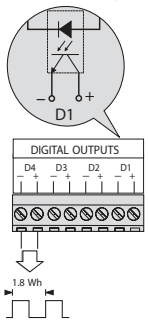
Note: *Mechanical relays should always be protected by external fuses*

Form A digital outputs: solid state relays D1 - D4

ION7550 / ION7650



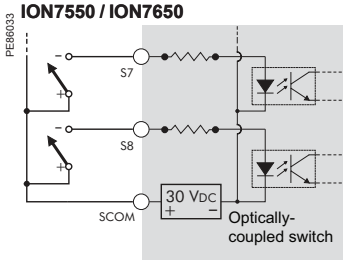
Form A Relay



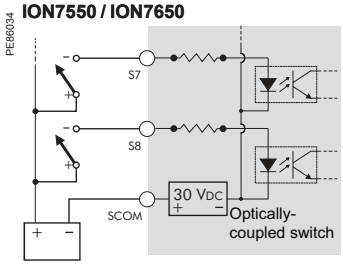
Note: *D4 output is factory-configured to pulse once every 1.8 Wh for Class 20 meters, or once every 0.18Wh for Class 2 meters (for calibration testing purposes).*

Digital inputs: S1 - S8

Internal Excitation
ION7550 / ION7650



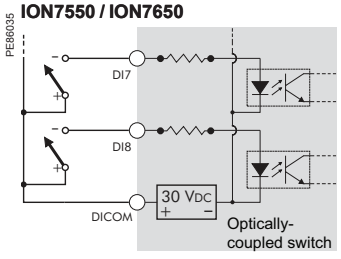
External Excitation
ION7550 / ION7650



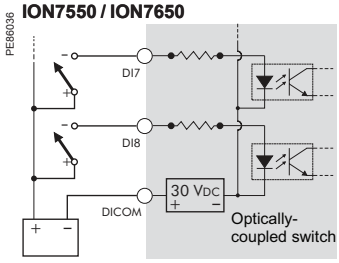
Note: *External Supply = 130 VDC max*

Digital inputs: DI1 - DI8 (option)

Internal Excitation
ION7550 / ION7650



External Excitation
ION7550 / ION7650

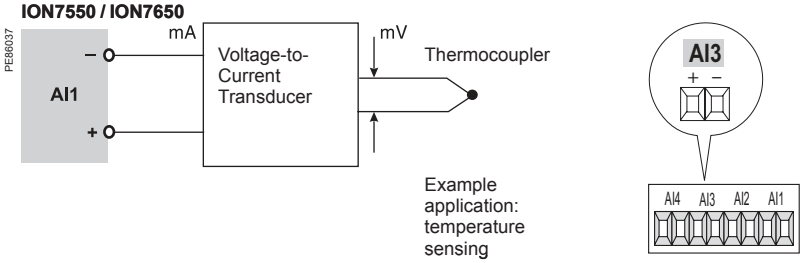


Note: *External Supply = 50 VDC max*

ION7550 / ION7650
Installation and connection (cont.)

Analog inputs: AI1 to AI4 (option)

ION7550 / ION7650

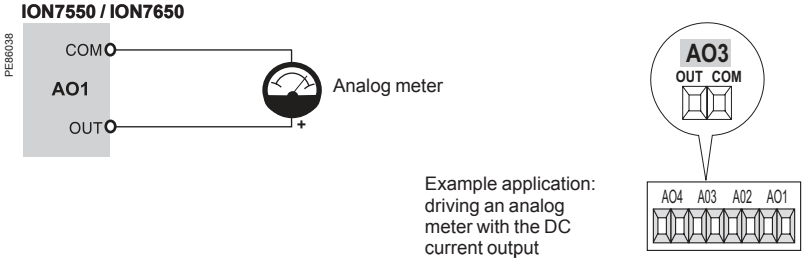


Example application: temperature sensing

Note: *do not connect the analog inputs of the I/O card to the analog outputs on the same I/O card.*

Analog outputs: AO1 to AO4 (option)

ION7550 / ION7650



Example application: driving an analog meter with the DC current output

Note: *do not connect the analog inputs of the I/O card to the analog outputs on the same I/O card.*

ION8600
Functions and characteristics

PE86175

PowerLogic ION8600 socket meter

Used to monitor electric energy provider networks, service entrances and substations, PowerLogic™ ION8600 meters are ideal for independent power producers and cogeneration applications that need to accurately measure energy bi-directionally in both generation and stand-by modes. These meters give utilities the tools to manage complex energy supply contracts that include commitments to power quality. Integrate them with our ION Enterprise™ operations software or other energy management and SCADA systems through multiple communication channels and protocols, including MV-90.

Applications

Tariff metering
Co-generation and IPP monitoring
Compliance monitoring
Power quality analysis
Demand and power factor control
Load curtailment
Equipment monitoring and control
Energy pulsing and totalisation
Instrument transformer correction

Main characteristics

IEC 62053-22/23 Class 0,2S metering
For interconnection points on medium, high, and ultra-high voltage networks in compliance with IEC 62053-22/23 Class 0.2S

Power quality compliance monitoring
Monitor compliance with international quality-of-supply standards (EN50160, IEC61000-4-7, IEC61000-4-15, CBEMA/ITIC)

Digital fault recording
Simultaneous capture of voltage and current channels for sub-cycle disturbance transients

Complete communications
Multi-port, multi-protocol access serial ports, infrared data port, internal modem, Itron software support, optional IRIG-B port; supports concurrent Ethernet, serial, and modem communications

Multiple tariffs and time-of-use
Apply tariffs, seasonal rate schedules to measure energy and demand values for time periods with specific billing requirements

Multiple setpoints for alarm and control functions
A total of 65 setpoints are configurable for 1-second or ½ - cycle operation.

Power quality summary
Consolidation of all the power quality characteristics into a single trendable index

Integrate with software
Easily integrate with ION Enterprise operations software or other energy management systems; MV90, DNP, Modbus

Transformer/line loss compensation
Determine technical system losses in real time

Instrument transformer correction
Save money and improve accuracy by correcting for less accurate transformers

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

Part numbers

ION8600 meters	
ION8600A	**M8600A**
ION8600B	**M8600B**
ION8600C	**M8600C**

See page 88 for complete part number descriptions.

Options

See page 89.

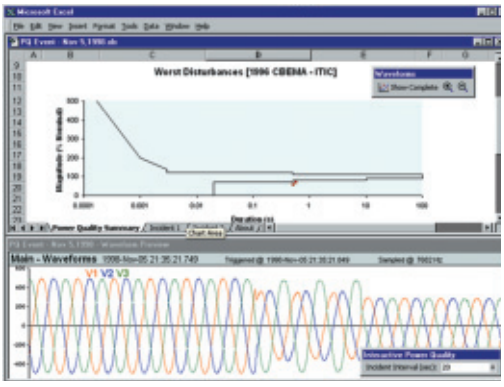
ION8600
Functions and characteristics (cont.)

PE86174

PowerLogic ION8600 socket meter.

1 *Blades*
2 *Optical port*
3 *Main display status bar*
4 *Watt LED*
5 *Navigation, ALT/Enter buttons*
6 *VAR LED*
7 *Form factor label*
8 *Demand reset switch*

PE86002



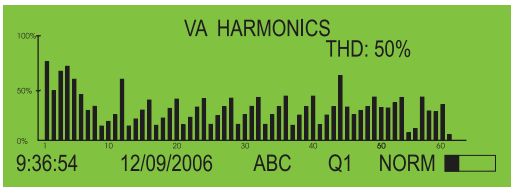
Disturbance waveform capture and power quality report

Selection guide		ION8600A ION8600B	ION8600C
General			
Use on LV and HV systems		■	■
Current accuracy		0.1 % reading	0.1 % reading
Voltage accuracy		0.1 % reading	0.1 % reading
Power accuracy		0.2 %	0.2 %
Nbr of samples/cycle or sample frequency		256	256
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 (autoranging)		0.01 - 20A	0.01 - 20A
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current	Present and max. values	■	■
Active, reactive, apparent power	Present and max. values	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Demand modes: Block (sliding), thermal (exponential)		■	■
Power quality measurements			
Harmonic distortion	Current and voltage	■	■
Individual harmonics	Via front panel	63	31
	Via ION Enterprise	127	127
Waveform capture		■(1)	■
Detection of voltage swells and dips		■	■
Adaptive waveform capture		■	■
Detection and capture of transients		■(1)	-
Flicker		■(1)	-
High speed data recording (down to 10 ms)		■	-
EN50160 compliance checking		■	■
Programmable (logic and math functions)		■	■
Data recording			
Min/max of instantaneous values		■	■
Data logs		■	■
Event logs		■	■
Trending/forecasting		■	■
Alarms (optional automatic alarm setting)		■	■
Alarm notification via email (Meterm@il)		■	■
SER (Sequence of event recording)		■	■
Time stamping		■	■
GPS synchronisation		■	■
Memory (in Mbytes)		10 (1), 5 (2)	2
Display and I/O			
Front panel display		■	■
Wiring self-test		■	■
Pulse output (front panel LED)		2	2
Digital or analogue inputs(3) (max)		11	11
Digital or analogue outputs(3) (max, including pulse output)		16	16
Direct connection voltage		277V(4)	277V(4)
Communication			
RS 485 / RS 232 port		1	1
RS 485 port		1	1
Infrared port		1	1
Ethernet port (Modbus/TCP/IP protocol) with gateway		1	1
HTML web page server (WebMeter)		■	■
Internal modem with gateway (ModemGate)		1	1
IRIG-B port		1	1
Modbus TCP Master / Slave (Ethernet port)		■ / ■	- / ■
Modbus RTU Master / Slave (Serial ports)		■ / ■	- / ■
DNP 3.0 through serial, modem, and I/R ports		■	■

***(1)** Feature set 'A' only.*
***(2)** Feature set 'B' only.*
***(3)** With optional I/O Expander.*
***(4)** For 9S, 39S, 36S, and 76S only. For 35S system up to 480V line-to-line.*

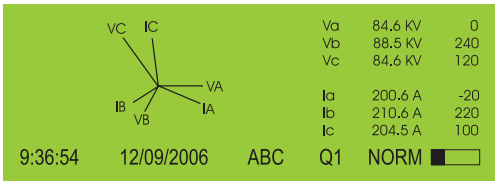
ION8600
Functions and characteristics (cont.)

PE86041



PowerLogic ION8600 front panel harmonic display.

PE86042

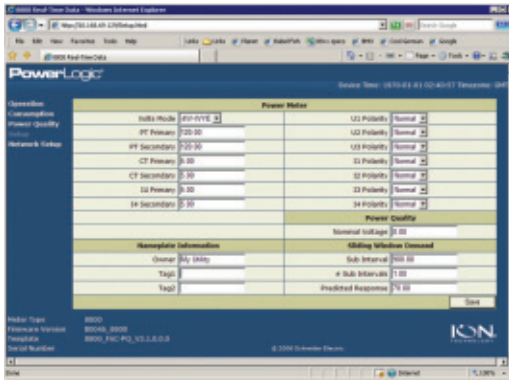


ION8600 front panel phasor display and table.

Electrical characteristics		
Type of measurement		True rms up to the 63rd harmonic Up to 256 samples per cycle Up to 51 kHz for transient events
Measurement accuracy	Current and voltage	0.1 % Reading
	Power	0,2%
	Frequency	±0.005 Hz
	Power factor	0.5%
	Energy	IEC 62053-22/23 (0,2S)
Data update rate		0.5 cycle or 1 second (depending on value)
Input-voltage characteristics	Measured voltage	57V to 277V autoranging (9S) 120V to 480V autoranging (35S)
	Impedance	5 MΩ /phase (phase-Uref/Ground)
	Inputs	V1, V2, V3, VREF
Input-current characteristics	Rated nominal/current class	5 A and/or 10 A (Standard, class 10/20) 1 A, 2 A and 5 A (Optional, class 1/10)
	Measurement range	0.005 - 20 A autoranging (standard range) 0.001 - 10 A autoranging (optional range)
	Permissible overload	500A rms for 1 second, non-recurring (standard) 200A rms for 1 second, non-recurring (optional)
	Impedance	0.002 Ω per phase (Standard IEC 5 A and 10 A) 0.015 Ω per phase (Optional IEC 1 A to 10 A)
	Burden	Low current switchboard: 0.025VA per phase at 1A; Standard switchboard - 0.20VA per phase at 5A; All socket mounts - 0.05VA per phase at 5A
Power supply	Standard power supply, 120-277 VAC	120-277 VLN RMS (-15%/+20%) 47-63 Hz or 120-480 VLN RMS (-15%/+20%) 47-63 Hz (35S)
	Standard (low voltage) power supply, 57-70 VAC	57-70 (-15%/+20%) VLN RMS, 47-63 Hz 35S unavailable
	Auxiliary power cable assembly, 65-120 VAC	AC: 65-120 (+/- 15%) VLN RMS, 47-63 Hz DC: 80-160 (+/- 20%) VDC
	Auxiliary power cable assembly, 160-277 VAC	AC: 160-277 (+/- 20%) VLN RMS, 47-63 Hz DC: 200-350 (+/- 20%) VDC
	Ride-through time, 120-277 VAC (Standard power supply)	Min 100 ms (6 cycles at 60 Hz at 96 VAC), 200 ms (12 cycles at 60 Hz at 120 VAC), 800 ms (48 cycles at 60 Hz at 240 VAC)
	Ride-through time, 57-70 VAC (Standard low voltage power supply)	Min 100 ms or 6 cycles 60 Hz at 46 VAC
Input/outputs	Digital outputs (Form C)	4 Solid state relay outputs (130 V AC/ 200 V DC) 100 mA AC/DC
	Digital outputs (Form A)	4 Solid state relay outputs (with optional I/O Expander)
	Digital inputs	4 Solid state digital inputs (supported through optional I/O Expander)
Mechanical characteristics		
Weight		7.0 kg
IP degree of protection	Socket	Front IP65, back IP51
	Switchboard	Front IP50, back IP30
Dimensions	Socket	178 x 237 mm
	Switchboard	285 x 228 x 163 mm
Environmental conditions		
Operating temperature		-40°C to +85°C
Display operating range		-20°C to +60°C
Storage temperature		-40°C to +85°C
Humidity rating		5 to 95 % RH non-condensing
Pollution degree		2
Installation category		Cat III
Dielectric withstand		2.5kV, 50Hz, 1 min
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		IEC 61000-4-5
Immunity conducted		IEC61000-4-6
Damped oscillatory waves immunity		IEC61000-4-12
Conducted and radiated emissions		CISPR 22 (class B)
Safety		
Europe		As per IEC62052-11
North America		As per ANSI C12.1

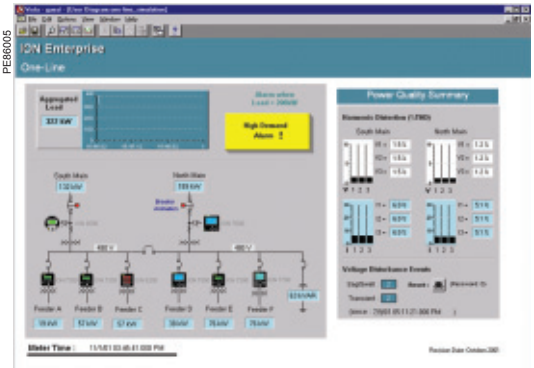
ION8600
Functions and characteristics (cont.)

PE86004



Example embedded webserver page (WebMeter) showing realtime values.

PE86005



Communication	
ANSI 12.18 Type II optical port	Up to 19200 bauds
RS 485 port	Up to 57600 bauds, Modbus, direct connection to a PC or modem
RS 232 / RS 485 port	300 - 115,200 bauds (RS485 limited to 57,600 bps); protocols: ION, Modbus/RTU, DNP 3.0, GPSTRUETIME/ DATUM
Internal modem port	300 bps-56k bps (automatic detection supported)
Ethernet port	10/100 BaseTX, RJ45 connector, 100 m link, protocols: DNP TCP, ION, Modbus TCP, Modbus Master
Fiber-optic Ethernet link	100 Base FX, LC duplex 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	Up to 31 slave devices via serial portsat 10Mbytes/sec.
ModemGate	Up to 31 slave devices
Embedded web server (WebMeter)	4 standard pages, up to 5 customisable pages
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. Can log data only during critical event to conserve memory
Harmonic distortion	Up to 127th harmonic for all voltage and current inputs (feature set A, via ION Enterprise operations software)
Dip/swell detection	Analyse severity/potential impact of dips 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 (1s) or high-speed (1/2 cycle) measurements, including true rms per phase / total 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 are user configurable: - 800 channels via 50 data recorders (feature set A), - 320 channels via 20 data recorders (feature set B), - 32 channels via two data recorders (feature set C). Configure for historical trend recording of energy, demand, voltage, current, power quality, other measured parameter. Recorders can trigger on time interval basis, calendar schedule, alarm/event condition, manually.
Waveform captures	Simultaneous capture of all voltage and current channels - sub-cycle disturbance capture (16 to 256 samples/ cycle) - maximum cycles is 214,000 (16 samples/cycle x 96 cycles, 10Mbytes memory)
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 priviledges.
Transformer correction	Correct for phase / magnitude inaccuracies in current transformers (CTs), potential transformers (PTs)
Memory	2 Mbytes (C), 4 Mbytes (B), 10 Mbytes (A)
Firmware update	Update via the communication ports
Display characteristics	
Type	FSTN transreflective LCD
Backlight	LED
Languages	English

(1) *All the communication ports may be used simultaneously.*

ION8600
Functions and characteristics (cont.)

PE86043

Example product part number.

1 *Model.*
2 *Feature set.*
3 *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.*

PE86132

PowerLogic ION8600 meter with switchboard case

Part Numbers

Item		Code	Description
1	Model	M8600	Schneider Electric advanced tariff meter.
2	Feature Set	A	10MB memory, 50 data recorders (800 channels), waveform recorders and transient detection.
		B	4MB memory, 20 data recorders (320 channels), Modbus mastering.
		C	2MB memory, 2 data recorders (32 channels), dip/swell detection
3	Form Factor	0	Form 9S Base: 57-277 V (autoranging) 3-Element, 4-Wire
		1	Form 35S Base: 120-480 V (autoranging) 2-Element, 3-Wire
		2	Form 36S Base: 57-277 V (autoranging) 2 1/2-Element, 4-Wire
		3	Form 39S with neutral current input (15 Terminal Base): 57-277 V (autoranging) 3-Element, 4-Wire
		N	Form 76S with neutral current input (15 Terminal Base): 57-277 V (autoranging) 2 1/2-Element, 4-Wire
		4	Form 9 FT21 Switchboard (meter + case) with breakouts
		5	Form 35 FT21 Switchboard (meter + case) with breakouts
		6	Form 36 FT21 Switchboard (meter + case) with breakouts
		7	Form 9 FT21 Switchboard (meter + case) with breakouts
		8	Form 35 FT21 Switchboard (meter + case) with breakouts
		9	Form 36 FT21 Switchboard (meter + case) with breakouts
4	Current Inputs	C	5 Amp nominal, 20 Amp full scale (50 Amp fault capture, start at 0.005A, accurate from 0.05 - 20A rms)
		E	1 Amp nominal, 10 Amp full scale (24 Amp fault capture, start at 0.001A, accurate from 0.01 - 20A rms)
5	Voltage Inputs	0	Standard (see Form Factor above)
6	Power Supply	E	Form 9S, 36S, 39S, 76S (socket) and Form 9, 36 (FT21 switchboard): 120-277 VAC. Form 35S (socket) and Form 35 (FT21 switchboard): 120-480 VAC. Powered from the meter's voltage connections.
		G	Form 9S, 36S (socket) and Form 9, 36 (FT21 switchboard): 57-70 VAC. Powered from the meter's voltage connections. NOT AVAILABLE on Form 35S and Form 35 - you must select the auxiliary power pigtail.
		H	Auxiliary Power Pigtail: 65-120 VAC or 80-160 VDC (power from external source)
		J	Auxiliary Power Pigtail: 160-277 VAC or 200-350 VDC (power from external source)
7	System Frequency	5	Calibrated for 50 Hz systems.
		6	Calibrated for 60 Hz systems.
8	Communications	A0	RS 232/RS 485 port, RS 485 port, infrared port.
		C1	Ethernet (10BaseT), 56k universal internal modem (RJ11), infrared optical port. RS 232/485 port (note this port is not available with feature set C).
		C2	Same as C1, but with RJ31 connector for the modem.
		E0	Ethernet (10BaseT), RS 232/485 port, infrared optical port, RS 485 port (note this port is not available with feature set C).
		F0	Ethernet (10BaseFL), RS 232/485 port, infrared optical port, RS 485 port (note this port is not available with feature set C) This option is not available with FT21 switchboard form factors (form factor options 4 through 9).
		M1	5 samples/cycle 56k universal internal modem (RJ11), RS 232/485 port, infrared optical port, RS 485 port (note this port is not available with feature set C).
9	Onboard I/O	A	None.
		B	4 Form C (KYZ) digital outputs and 3 Form A digital inputs.
10	Security	0	Password protected, no security lock*
		1	Password protected with security lock enabled (requires removal of outer cover to configure billing parameters)
		3	RMICAN (Measurement Canada approved)
		4	RMICAN-SEAL (Measurement Canada approved, and factory sealed)**
11	Special Order	A	None
		B	IRIG-B GPS time synchronisation port
		K	Customer supplied template (frameworks) installed at the factory.**
		L	Customer supplied template (frameworks) and IRIG-B GPS time synchronisation port.**

** NOT AVAILABLE in Canada*
*** For Special Order "K" and "L", you must also order the part number CUST-TEMP-SETUP (see ION8600 Related Items section). When the template (framework) is received, the factory will issue a 5-digit code that will be appended to the ION8600 part number.*

ION8600
Functions and characteristics (cont.)

PE86044

Example order code. Use this group of codes when ordering the I/O Expander.

1 *Digital / Analog I/O.*
2 *I/O option.*
3 *Cable option.*

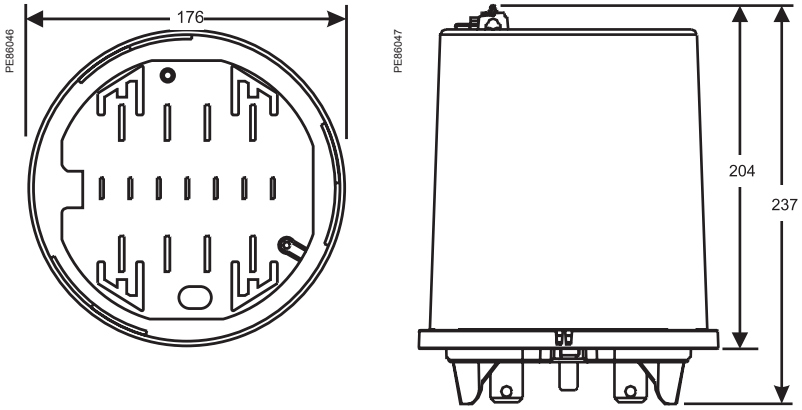
PE86131

Part numbers (cont.)

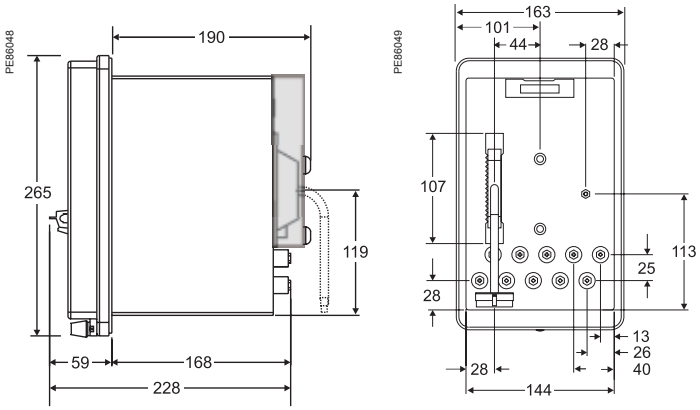
I/O Expander		
Digital/Analog I/O	**P850E**	Schneider Electric I/O Expander for ION8600 meters: Inputs and Outputs for energy pulsing, control, energy counting, status monitoring, and analog interface to SCADA.
I/O option	**A**	External I/O box with 8 digital inputs and 8 digital outputs (4 Form A, 4 Form C)
	B	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (0 to 20mA)
	C	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (-1mA to 1mA)
	D	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (two -1 to 1 mA, and two 0 to 20 mA outputs)
Cable option	**0**	No cable
	1	5ft extension cable, 24-pin male to 24-pin female Molex connector (not for use with breakout panel E8, F8 & G8 form factors)
	2	15ft extension cable, 24-pin male to 24-pin female Molex connector (not for use with breakout panel E8, F8 & G8 form factors)
	3	6ft connector cable, 24-pin male to 14-pin male Molex connector (for breakout panel E8, F8 & G8 form factors)
A-base adapters		
A-BASE-ADAPTER-9		Form 9S to Form 9A adapter
A-BASE-ADAPTER-35		Form 35S to Form 35A adapter
A-BASE-ADAPTER-39		Form 39S to Form 39A adapter
A-BASE-ADAPTER-76		Form 76S to Form 76A adapter
Optical communication interface		
OPTICAL-PROBE		Optical communication interface
Connector cables		
CBL-8X00BRKOUT		5ft Breakout Cable: 24-pin female Molex connector to one DB9 female connector for RS 232, and 2 sets of twisted pair wires for two RS 485 port connections
CBL-8X00IOE5FT		5ft extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin female Molex connector on the I/O Expander box (not for use with breakout panel E8, F8 & G8 form factors)
CBL-8X00IOE15FT		15ft extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin female Molex connector on the I/O Expander box (not for use with breakout panel E8, F8 & G8 form factors)
CBL-8XX0-BOP-IOBOX		6ft connector cable, 24-pin male to 14-pin male Molex connector for connecting an ION8600 meter with breakout panel to an I/O Expander Box

ION8600
Installation and connections

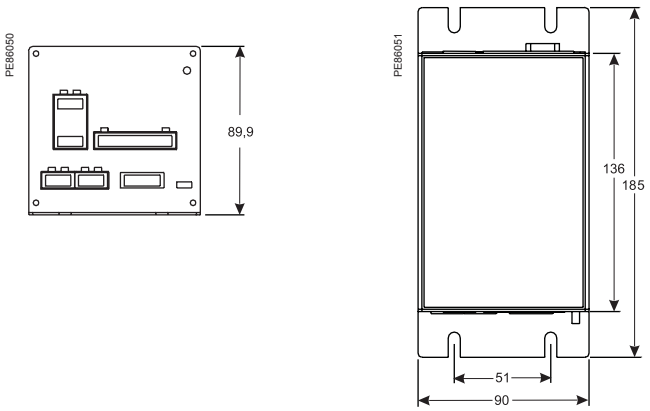
ION8600 socket dimensions



ION8600 switchboard dimensions

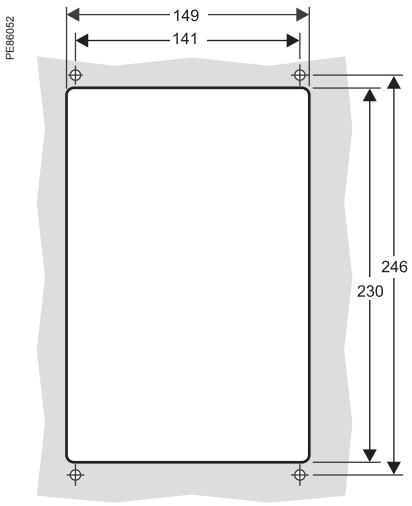


I/O Expander dimensions

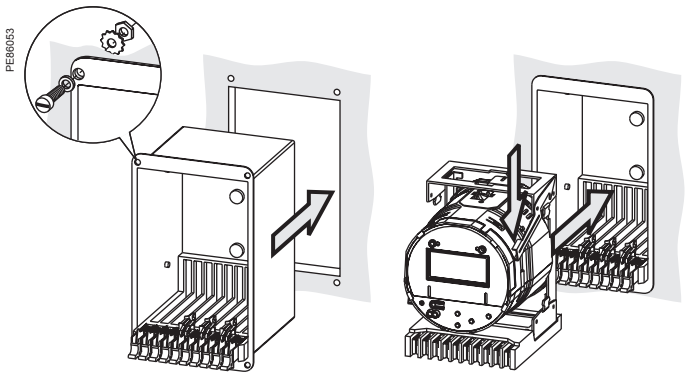


ION8600
Installation and connections (cont.)

ION8600 suggested switchboard mounting dimensions

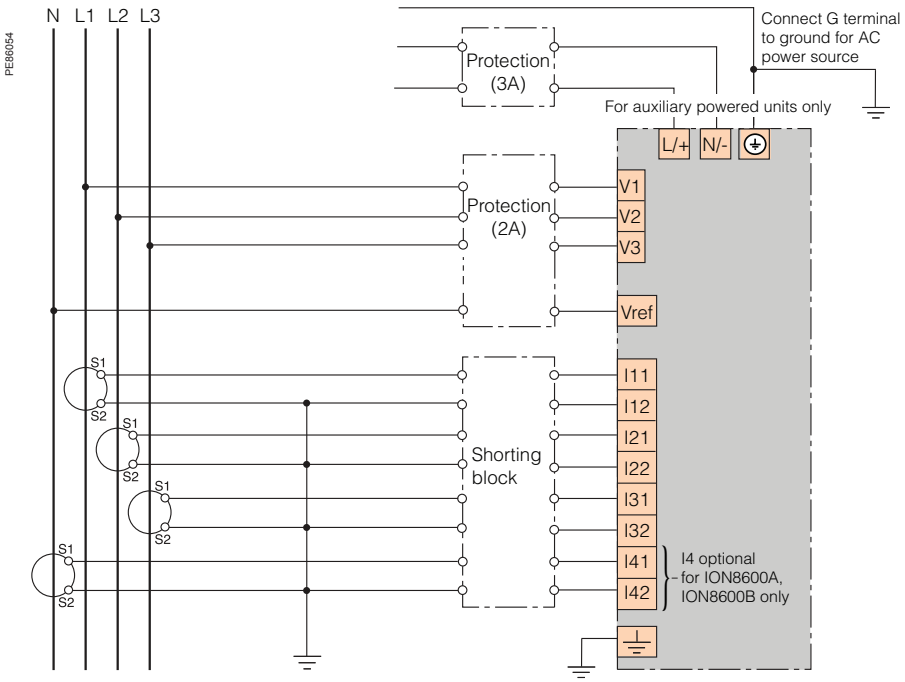


ION8600 switchboard mounting



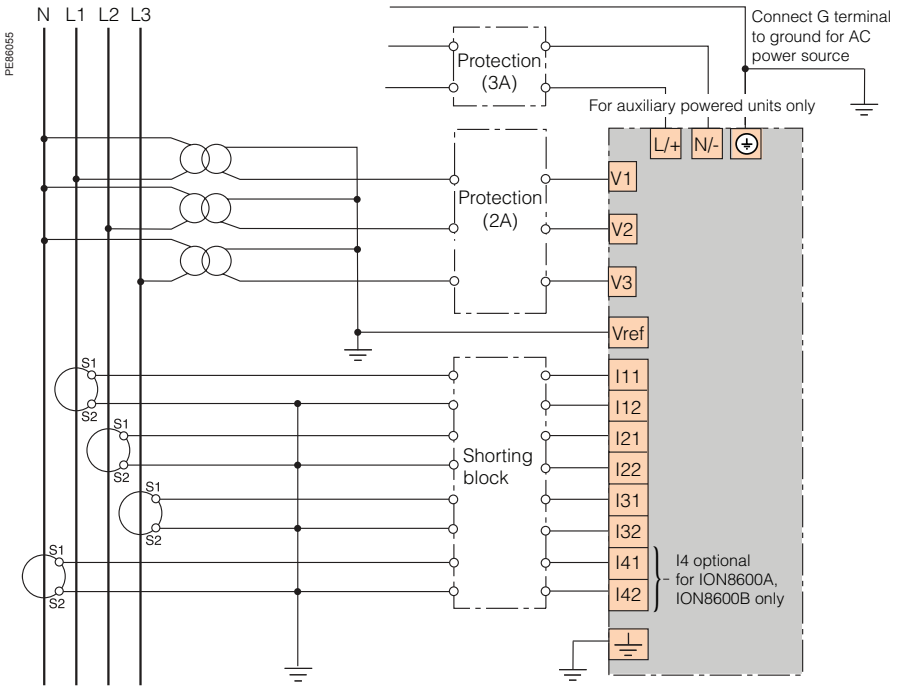
ION8600
Installation and connection (cont.)

4-Wire 3 element direct connection



Connection representation only. Other types of connection are possible. See product installation guide for complete wiring and communication connection details.

4-Wire 3 element, 3 PT connection



Connection representation only. Other types of connection are possible. See product installation guide for complete wiring and communication connection details.

ION8800
Functions and characteristics

PE86176

PowerLogic™ ION8800.

Providing high accuracy and a wide range of features for transmission and distribution metering, the ION8800 is the world's most advanced power and energy meter with the flexibility to change along with your needs.
The ION8800 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 meter with your existing wholesale settlement system, use ION Enterprise™, or share operations data with SCADA systems through multiple communication channels and protocols.

Applications
Transmission and distribution metering.
IEC 62053-22/23 Class 0,2S accuracy for settlements and customer billing.
Extensive power quality monitoring and analysis.
Digital fault recording.
Contract optimisation and compliance verification.
Instrument transformer correction.
Transformer/line loss compensation.

Main characteristics
IEC 19-inch rack mount design to DIN 43862 standard
Essailec connectors with common measurement and energy pulsing pin-out for easy retrofit into existing systems

Accurate metering
For interconnection points on medium, high, and ultra-high voltage networks in compliance with IEC 62053-22/23 Class 0,2S

Power quality compliance monitoring
Monitor compliance with internationl quality-of-supply standards (IEC 61000-4-30 class A, EN 50160, IEC 61000-4-7, IEC 61000-4-15, CBEMA/ITIC)

Digital fault recording
Simultaneous capture of voltage and current channels for sub-cycle disturbance transients

Complete communications
IEC1107 optical port, optional communications module supports concurrent Ethernet (10BaseFL or 10BaseT), serial, and modem communications

Multiple tariffs and time-of-use
Apply tariffs, seasonal rate schedules to measure energy and demand values for time periods with specific billing requirements

Multiple setpoints for alarm and control functions
Total of 65 setpoints for single/multi-condition alarms and control functions; 1 second response

Power quality summary
Consolidation of all the power quality characteristics into a single trendable index

Integrate with software
Easily integrate with ION Enterprise or other energy management systems; MV90, UTS

Transformer/line loss compensation
Determine technical system losses in real time

Instrument transformer correction
Save money and improve accuracy by correcting for less accurate transformers

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

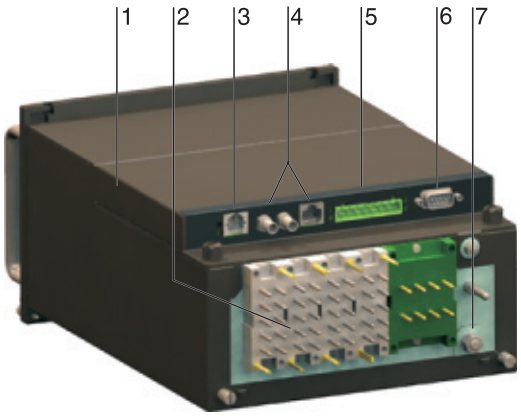
Part numbers[(1)]

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

[(1)]Representative part numbers only. See page 97 for complete part number descriptions.

ION8800
Functions and characteristics (cont.)

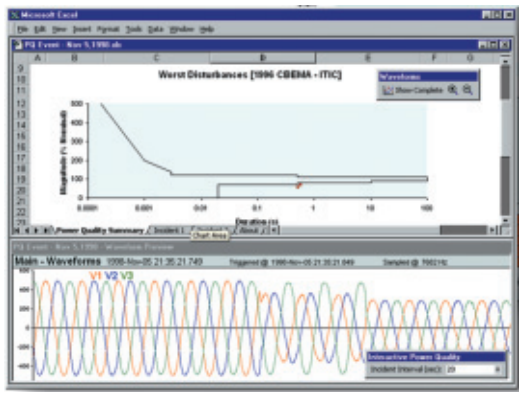
PE86001



PowerLogic ION8800

1 *Optional communications module.*
2 *Essailec connectors.*
3 *Internal modem.*
4 *Optional 10BaseT or 10BaseFL communications.*
5 *Selectable RS 485 serial port.*
6 *Selectable RS 232 or RS 485 serial port.*
7 *Ground terminal.*

PE86002



Sample power quality report.

Selection guide		ION8800A ION8800B	ION8800C
General			
Use on MV and HV systems		■	■
Current accuracy (1A to 5A)		0.1 % reading	0.1 % reading
Voltage accuracy (57V to 288V)		0.1 % reading	0.1 % reading
Power accuracy		0.2 %	0.2 %
Nbr of samples/cycle or sample frequency		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 (low-current option)		0.001 - 10A	0.001 - 10A
Current measurement range (high-current option)		0.005 - 10A	0.005 - 10A
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current		■	■
Active, reactive, apparent		■	■
Predicted active, reactive, apparent		■	■
Setting of calculation mode (block, sliding, thermal, predicted)		■	■
Power quality measurements			
Detection of voltage sags and swells		■	■
Symmetrical components: zero, positive, negative		■	-
Transient detection, microseconds (1)		20 (2)	-
Harmonics: individual, even, odd, total up to		63rd	63rd
Harmonics: magnitude, phase and inter-harmonics		50th	-
Flicker (IEC 61000-4-15)		■	-
Configurable for IEEE 519 - 1992, IEE159, SEMI		■	-
Programmable (logic and math functions)		■	■
Data recording			
Min/max logging for any parameter		■	■
Historical logs	Maximum # of cycles	800 (2) 640 (3)	32
Waveform logs	Maximum # of cycles	96 (2)	-
Timestamp resolution in seconds		0.001	0.001
Setpoints, minimum response time		½ cycle	½ cycle
Number of setpoints		65	65
GPS time synchronisation		■	■
Memory expandable up to		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 via email (MeterM@ail)		■	■
Logged data via e-mail (MeterM@il)		■	■
Embedded web server (WebMeter)		■	■

(1) *For 50 Hz line frequency.*
(2) *ION8800A only.*
(3) *ION8800B only.*

ION8800
Functions and characteristics (cont.)

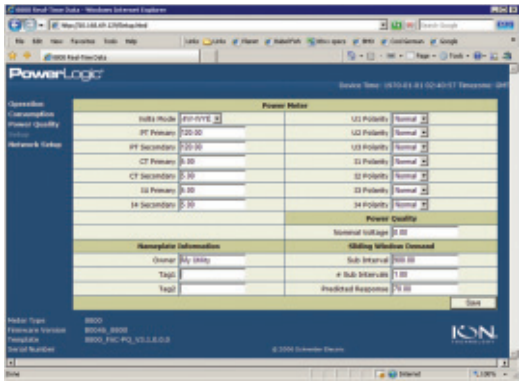
PE86003

PowerLogic ION8800 with optional communications module.

Electrical characteristics		
Type of measurement		True rms Up to 1024 samples per cycle
Measurement accuracy	Current and voltage	0.1 % reading
	Power	0,2%
	Frequency	±0.005 Hz
	Power factor	0.5%
	Energy	IEC 62053-22/23 Class 0.2 S
Data update rate		½ cycle or 1 second (depending on value)
Input-voltage characteristics	Measured voltage	Autoranging 57 - 288V LN (500 LL) inputs
	Measurement range	57-288VLN AC rms (99-500VLL AC rms)
	Impedance	5 MΩ /phase (phase-Uref/Ground)
	Inputs	V1, V2, V3, Vref
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 at 1A, 0.25 VA per phase at 5 A
Power supply	AC	85 - 240 VAC (+/- 10%), 47-63 Hz
	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)
Input/outputs	Mechanical alarm relay	1 Form C digital output (250 V AC / 125 V DC, 1 A AC / 0.1 A DC max)
	Digital outputs (Form C)	4 Solid state relay outputs (210 V AC / 250 V DC) 100 mA AC/DC
	Digital outputs (Form A)	8 Solid state relay outputs (210 V AC / 250 V DC) 100 mA AC/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		
Operating temperature		-25°C to +55°C
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		III
Dielectric withstand		2 kVAC, 50 Hz, 1 min
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

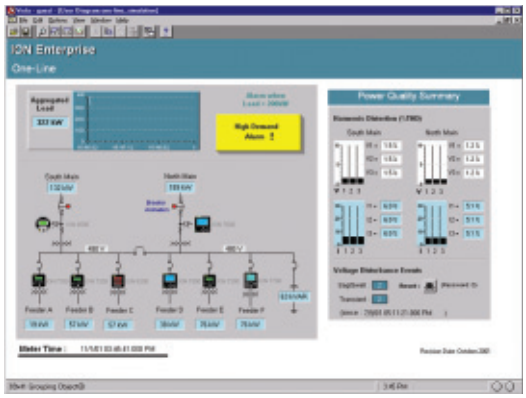
ION8800
Functions and characteristics (cont.)

PE86004



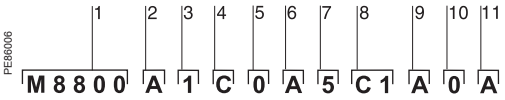
Example embedded webserver page (WebMeter) showing realtime values.

PE86005



Communication	
IEC 1107 optical port	2/4 wires, up to 19200 bauds
RS 485 port	Up to 57600 bauds, Modbus, direct connection to a PC or modem
Communications module (optional)	
RS 232/485 port	300 - 115,200 bauds (RS 485 limited to 57,600 bauds); protocols: ION, Modbus RTU, Modbus Master, DNP 3.0, GPSTRUETIME/DATUM, DLMS
Internal modem port	300 bauds - 56000 bauds
Ethernet port	10 BaseTX, RJ45 connector, 100 m link; protocols: DNP TCP, ION, Modbus TCP, Modbus Master
Fiber-optic Ethernet link	100 Base FL, LC duplex 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
Embedded web server (WebMeter)	5 customisable pages, new page creation capabilities, HTML/XML compatible
Firmware characteristics	
High-speed data recording	Up to ½-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 63rd 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 (1s) or high-speed (½ cycle) measurements, including true rms per phase / total 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 measureable 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 priviledges.
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

ION8800
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 series meter with integrated display, V1-V3 wide-range voltage inputs (57-288 VAC L-N or 99-500 VAC L-L). I1-I3 current inputs with additional I4. Supports ION, Modbus-RTU, DNP 3.0 and DLMS protocols. English and French documentation ships with every meter. For onboard I/O see comments below.
2 Feature Set	A	Feature Set B + power quality analysis (waveforms and transient capture with 1024 samples/cycle resolution).
	B	Feature Set C plus EN50160 compliant 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.
4 Current Inputs	C	(I1-I3): Configured for 5 A nominal, 10 A full scale, 14 A fault capture, 0.005 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 110-300 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).
	M1	Standard communications plus 56k universal internal modem (RJ11).
9 Onboard I/O and communications (not field serviceable, part of base unit)	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).
	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).
10 Security	0	Password protected, no security lock.
	1	Password protected with security lock enabled.
11 Special Order	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.*

ION8800
Functions and characteristics (cont.)

PE86007

Optional ION8800 communications module.

Part Numbers (cont.)

ION8800 communications module for field retrofit installations

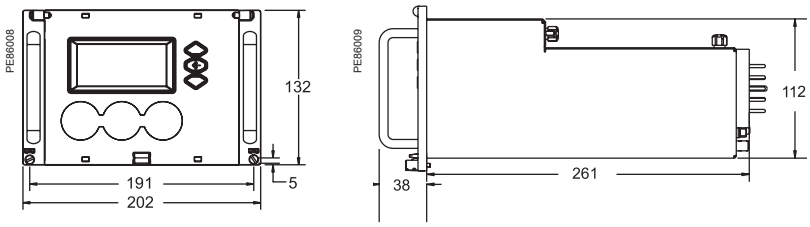
Item	Code	Description
P880C	A0	Standard communications: 1 RS-232/RS-485 port, 1 RS-485 port (COM2)(1).
	C1	Standard communications plus 10Base-T Ethernet (RJ45), 56k universal internal modem (RJ11).
	D1	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL Ethernet Fiber, 56k universal internal 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.*

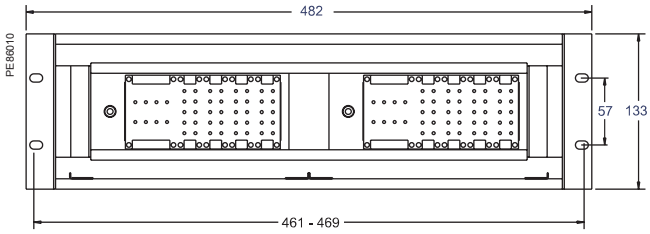
Note: *The part number above should conform to the following format: P880C A0 A.*

ION8800
Installation and connections

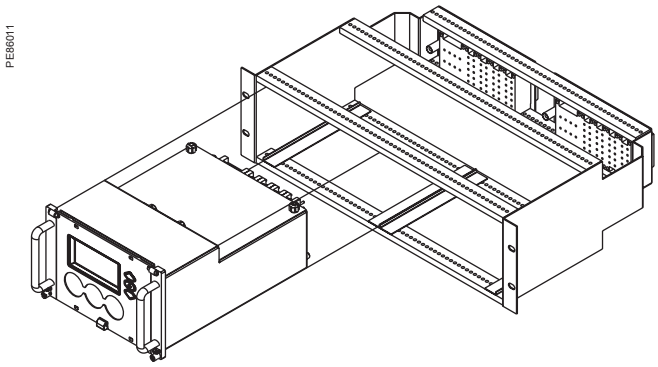
ION8800 dimensions



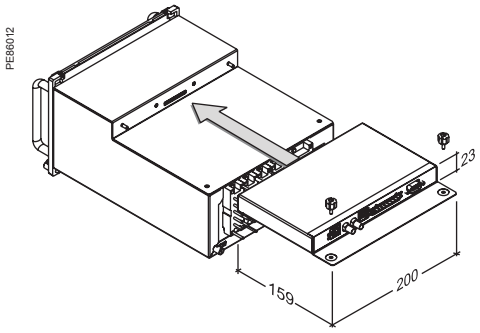
ION8800 Essailec rack dimensions



Rack mounting the ION8800

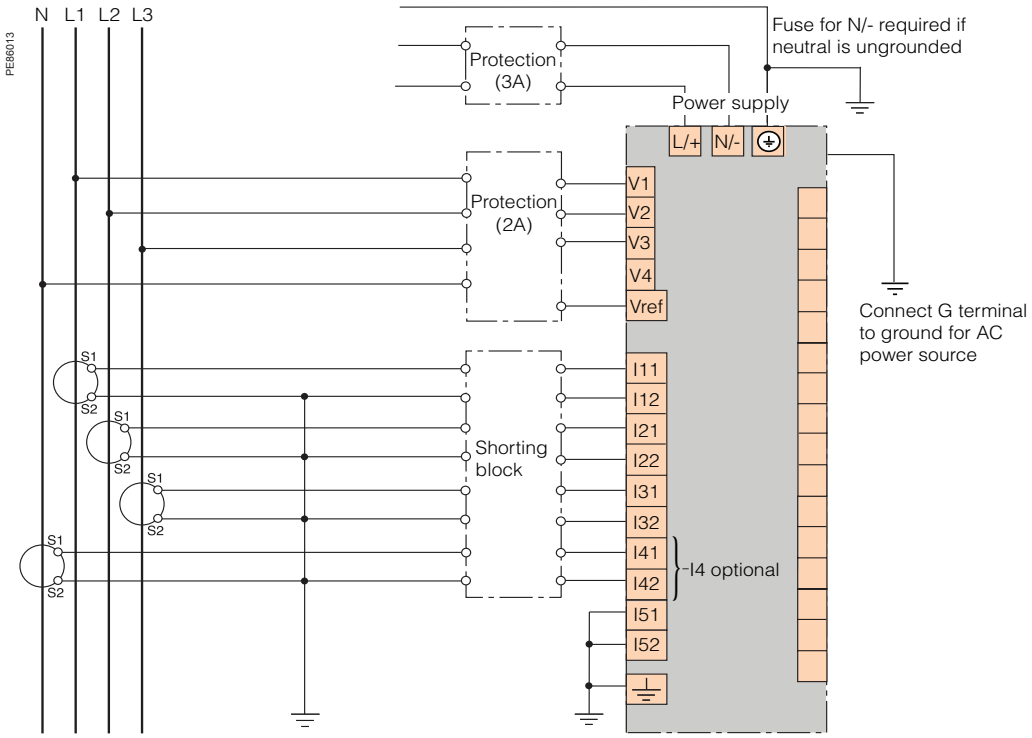


ION8800 communication module dimensions



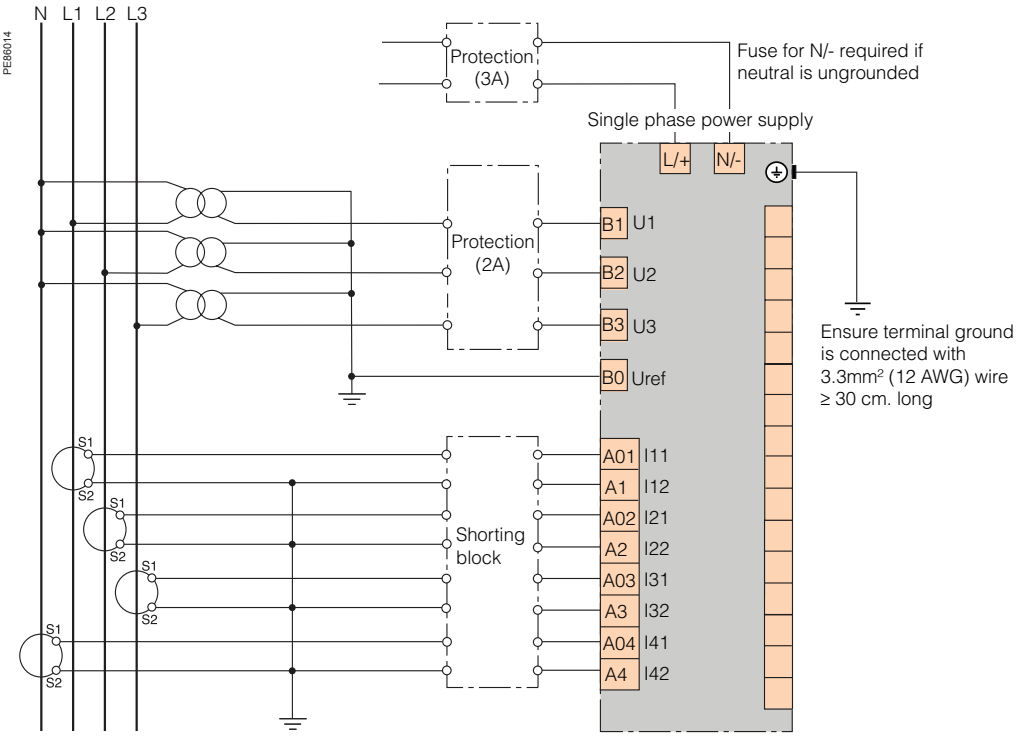
ION8800
Installation and connection (cont.)

4-wire 3 element direct connection



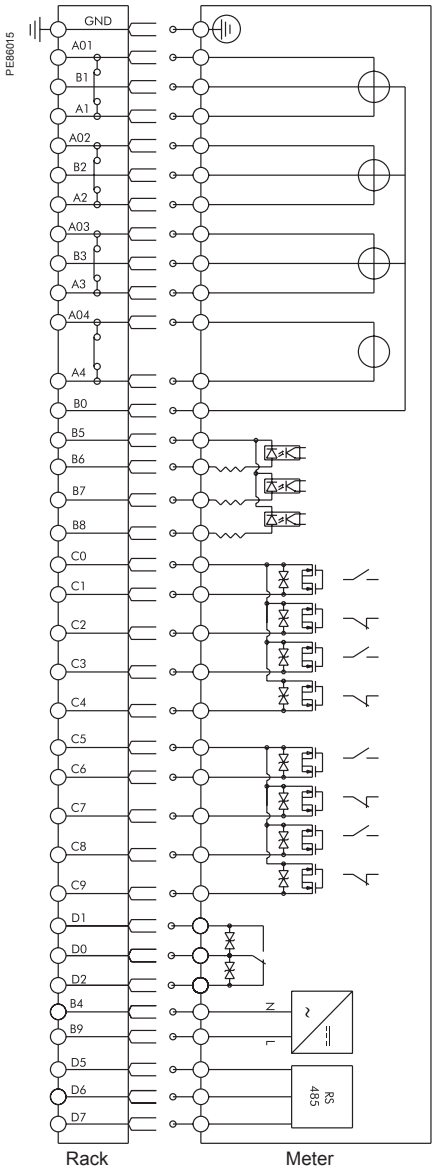
Connection representation only. See product installation guide for complete wiring and communication connection details.

4-wire 3 element 3 PT connection



Connection representation only. See product installation guide for complete wiring and communication connection details.

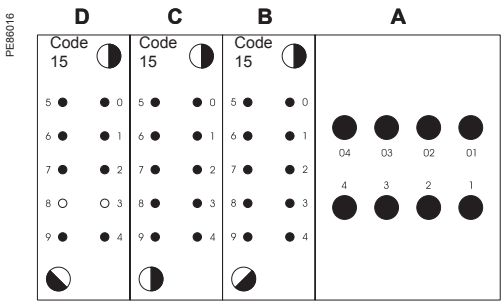
ION8800
Installation and connection (cont.)



Item	Meter port	Essailec pin	Description
Current measurement inputs	I11	A01	standard
	I12	A1	standard
	I21	A02	standard
	I22	A2	standard
	I31	A03	standard
	I32	A3	standard
	I41	A04	optional
	I42	A4	optional
Voltage measurement inputs	Vref	B0	standard
	V1	B1	standard
	V2	B2	standard
	V3	B3	standard
Digital inputs	DI-SCOM	B5	standard; common
	DI1	B6	standard
	DI2	B7	standard
	DI3	B8	standard
Power supply inputs (AC/DC)	Power supply N/-	B4	Power supply neutral (-)
	Power supply L/+	B9	Power supply line (+)
Form C solid-state relays	DO1 & DO2 K	C0	standard; common
	DO1	C1	standard; NO
	DO1	C2	standard; NC
	DO2	C3	standard; NO
	DO2	C4	standard; NC
	DO3 & DO4 K	C5	standard; common
	DO3	C6	standard; NO
	DO3	C7	standard; NC
	DO4	C8	standard; NO
	DO4	C9	standard; NC
Form C mechanical relay	Alarm K	D0	standard; common
	Alarm	D1	standard; NO
	Alarm	D2	standard; NC
	-	D3	Unused
RS 485 com	RS 485 Shield	D5	RS 485 shield
	RS 485 +	D6	RS 485 +
	RS 485 -	D7	RS 485 -
	-	D8	Unused
IRIG-B clock synchronization input (1)	IRIG-B input common	D4	optional; clock synch input Common
	IRIG-B input	D9	optional; clock synch input

(1) *Option not currently available.*

Essailec representation only. See product installation guide for complete Essailec rack wiring and communication connection details.



Communication interfaces and associated services

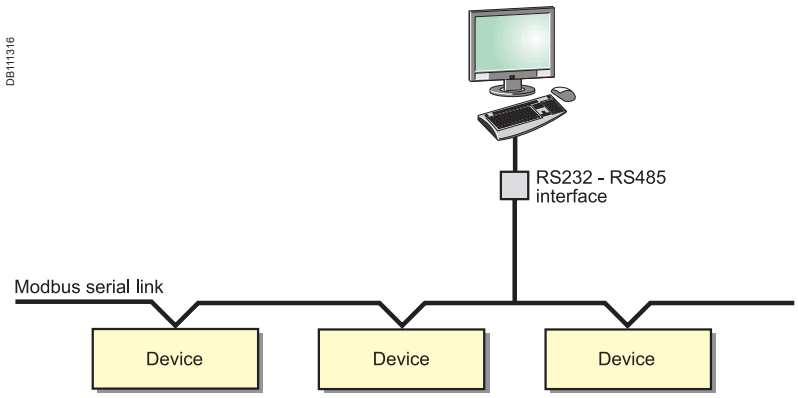
Switchboard-data acquisition and monitoring make it possible to anticipate events. In this way, they reduce customer costs in terms of operation, maintenance and investment.

Serial link

With communication technology, it is no longer necessary to be physically present at the site to access information. Data is transmitted by networks.

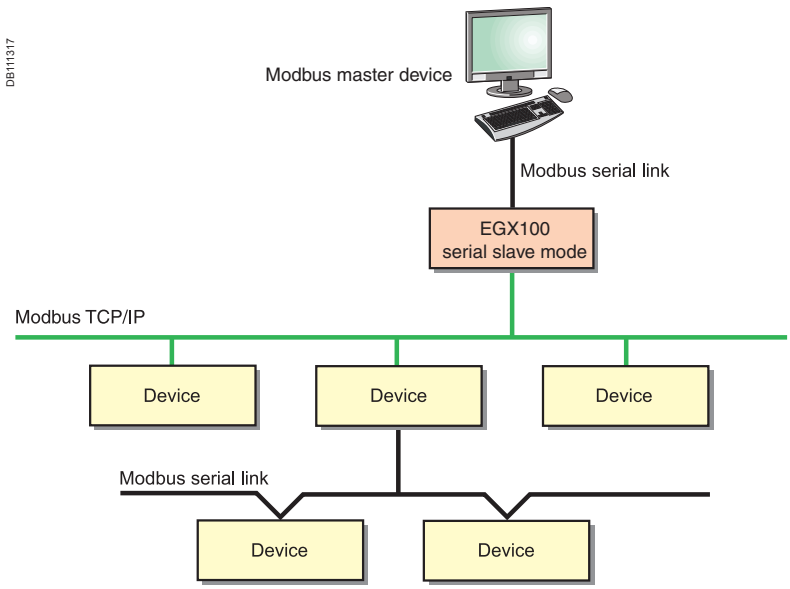
In all architectures, the communication interface serves as the link between the installation devices and the PC running the operating software. It provides the physical link and protocol adaptation. Adaptation is required because the communication systems used by the PC (Modbus via RS232 and/or Ethernet) are generally not those used by the installation devices (e.g. the Modbus protocol via RS485).

Dedicated application software prepares the information for analysis under the best possible conditions.



Modbus communication architecture.

In addition, an EGX100 in serial port slave mode allows a serial Modbus master device to access information from other devices across a Modbus TCP/IP network.



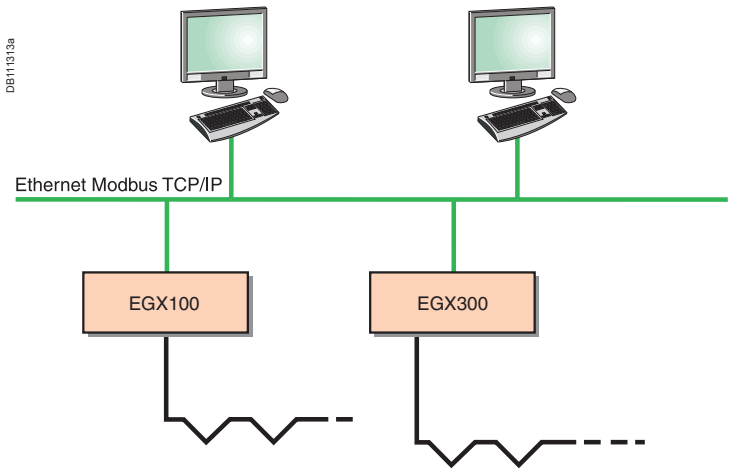
Modbus communication across Ethernet network

Communication interfaces and associated services (cont.)

Ethernet link

Using modern Web technologies, the operator can access information from monitoring and protection devices using any PC connected to the network, with all the required security.

The Ethernet EGX100 gateway or the EGX300 integrated gateway-servers provide connectivity between Modbus RS485 and Ethernet Modbus TCP/IP.



Ethernet communication architecture.

The services available with these technologies considerably simplify the creation, maintenance and operation of these supervision systems.

The application software is now standardised: the web interface into the system does not require custom web pages to be created. It is personalised by simply identifying the components in your installation and can be used as easily as any internet application.

The first step in this approach is the EGX300 integrated gateway-server with HTML pages. Power management software (ION Enterprise, System Manager or PowerView), running on a PC, provide broader coverage for more specific needs.

PowerLogic EGX100
Ethernet gateway

PE86138

PowerLogic EGX100

Function

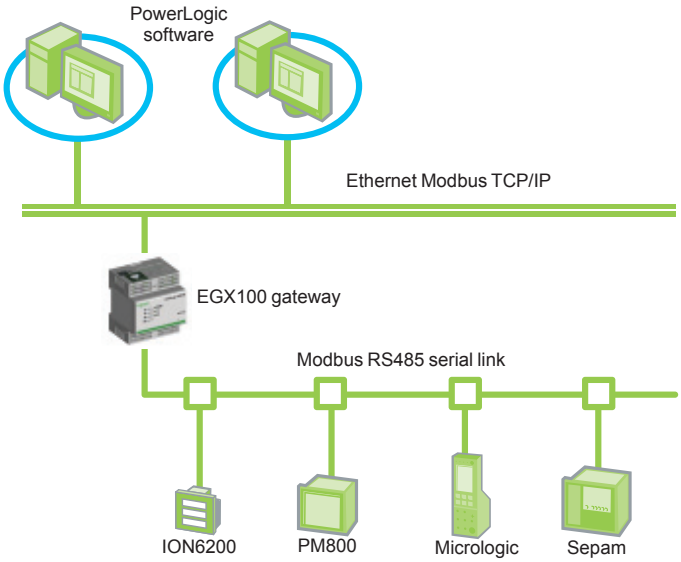
The EGX100 serves as an Ethernet gateway for PowerLogic system devices and for any other communicating devices utilising the Modbus protocol. The EGX100 gateway offers complete access to status and measurement information provided by the connected devices via PowerLogic software installed on a PC.

PowerLogic software compatibility

PowerLogic software is recommeded as a user interface because they provide access to all status and measurement information. They also prepare summary reports. The EGX100 is compatible with:

- PowerLogic ION EEM enterprise enery management software
- PowerLogic ION Enterprise power management software
- PowerLogic System Manager power management software
- PowerLogic PowerView power monitoring software

Architecture



Setup

Setup via an Ethernet network

Once connected to an Ethernet network, the EGX100 gateway can be accessed by a standard internet browser via its IP address to:

- specify the IP address, subnet mask and gateway address of the EGX gateway
- configure the serial port parameters (baud rate, parity, protocol, mode, physical interface and timeout value)
- create user accounts
- create or update the list of the connected products with their Modbus or PowerLogic communication parameters
- configure IP filtering to control access to serial devices
- access Ethernet and serial port diagnostic data
- update the firmware
- specify the user language

Setup via a serial connection

Serial setup is carried out using a PC connected to the EGX100 via an RS232 link. This setup:

- specifies the IP address, subnet mask and gateway address of teh EGX gateway
- specifies the language used for the setup session

Part numbers

Powerlogic EGX100	
EGX100	**EGX100MG**

PowerLogic EGX100
Ethernet gateway

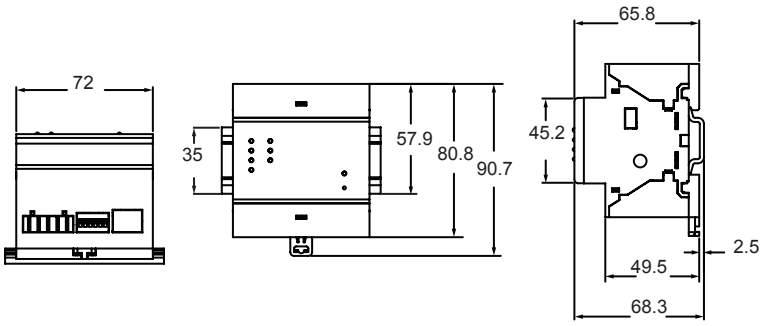
PE86138

PowerLogic EGX100

Characteristics	
	EGX100
Weight	170g
Dimensions (HxWxD)	91 x 72 x 68 mm
Mounting	Din rail
Power-over-Ethernet (PoE)	Class 3
Power supply	24 Vdc if not using PoE
Operating temperature	-25 to 70ºC
Humidity rating	5 to 95% relative humidity (without condensation) at +55ºC
Regulatory/standards compliance for electromagenetic interference	
Emissions (radiated and conducted)	EN55022/EN55011/FCC class A
Immunity for industrial environments:	EN 61000-6-2
- electrostatic discharge	EN 61000-4-2
- radiated RF	EN 61000-4-3
- electrical fast transients	EN 61000-4-4
- surge	EN 61000-4-5
- conducted RF	EN 61000-4-6
- power frequency magnetic field	EN 61000-4-8
Regulatory/standards compliance for safety	
International (CB scheme)	IEC 60950
USA	UL508/UL60950
Canada	cUL (complies with CSA C22.2, no. 60950)
Europe	EN 60950
Australia/New Zealand	AS/NZS25 60950
Serial ports	
Number of ports	1
Types of ports	RS232 or RS485 (2-wire or 4-wire), depending on settings
Protocol	Modbus RTU/ASCII, PowerLogic (SY/MAX), Jbus
Maximum baud rate	38400 or 57600 baud depending on settings
Maximum number of directly connected devices	32
Ethernet port	
Number of ports	1
Types of ports	One 10/100 base TX (802.3af) port
Protocol	HTTP, Modbus TCP/IP, FTP, SNMP (MIB II), SNTP, SMTP
Baud rate	10/100 MB

Installation

Din rail mounting



PowerLogic EGX300
Integrated gateway-server

PE86181

PowerLogic EGX300

Function

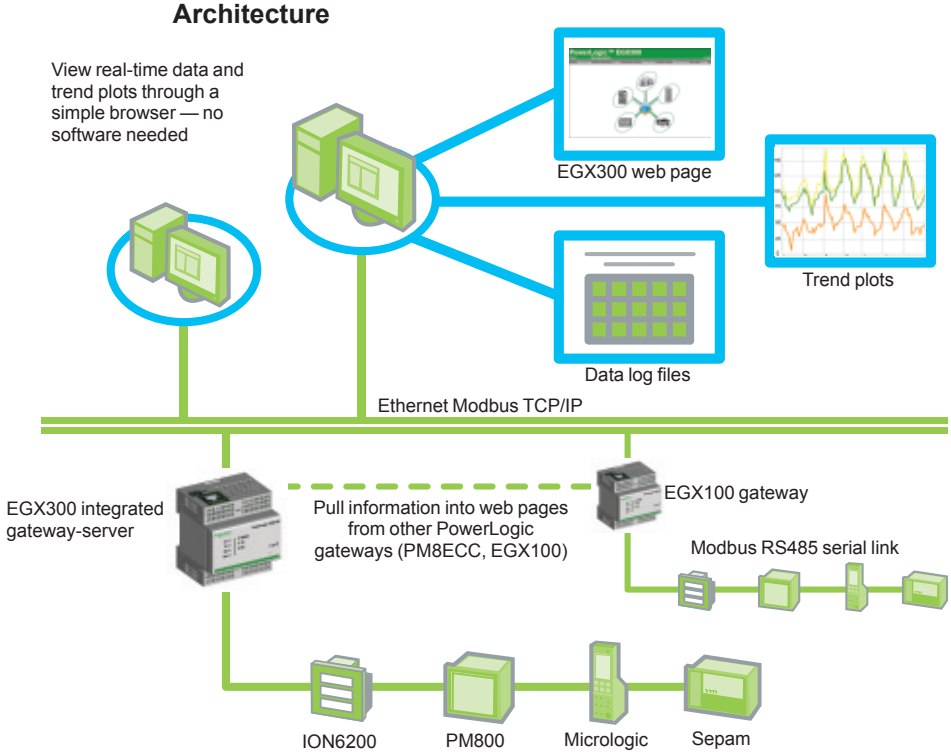
The EGX300 integrated gateway-server uses only a simple web browser and Ethernet network to access, log and display real-time data and trend plots from up to 64 PowerLogic system devices, including other gateway devices on the same network. The EGX300 embedded web page function and 512 Mb of onboard memory allow users to create pages for viewing data from their electrical system and store third-party web pages and documents such as instruction bulletins or equipment and system diagrams.

PowerLogic software compatibility

Combine the EGX300 with PowerLogic software for extensive analysis and additional functionality. The EGX300 is compatible with:

- PowerLogic ION EEM enterprise energy management software
- PowerLogic ION Enterprise power management software
- PowerLogic System Manager power management software
- PowerLogic PowerView power monitoring software

Architecture



Features

- View real-time and historical information from multiple locations via any Microsoft-compatible web browser
- Automatically detect networked devices for easy setup
- Automatically email or FTP selected logged data to your PC for additional analysis
- Select the logging intervals and topics you want logged
- Ensures data and system security through password protection and controlled network access to individual web pages
- Simplifies installation by receiving control power through the Ethernet cable utilising Power-over-Ethernet and offers the option to utilise 24 Vdc control power

Part numbers

Powerlogic EGX300	
EGX300	**EGX300**

PowerLogic EGX300
Integrated gateway-server

PE86181

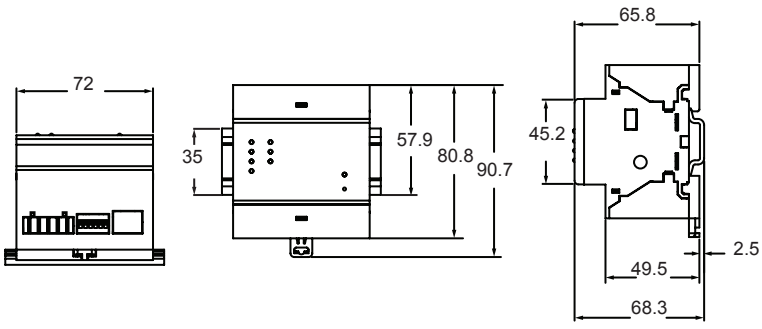
PowerLogic EGX300

Characteristics

	EGX300
Weight	170g
Dimensions (HxWxD)	91 x 72 x 68 mm
Mounting	Din rail
Power-over-Ethernet (PoE)	Class 3
Power supply	24 Vdc if not using PoE
Operating temperature	-25 to 70ºC
Humidity rating	5 to 95% relative humidity (without condensation) at +55ºC
Regulatory/standards compliance for electromagenetic interference	
Emissions (radiated and conducted)	EN55022/EN55011/FCC class A
Immunity for industrial environments:	EN 61000-6-2
- electrostatic discharge	EN 61000-4-2
- radiated RF	EN 61000-4-3
- electrical fast transients	EN 61000-4-4
- surge	EN 61000-4-5
- conducted RF	EN 61000-4-6
- power frequency magnetic field	EN 61000-4-8
Regulatory/standards compliance for safety	
International (CB scheme)	IEC 60950
USA	UL508/UL60950
Canada	cUL (complies with CSA C22.2, no. 60950)
Europe	EN 60950
Australia/New Zealand	AS/NZS 60950
Serial ports	
Number of ports	1
Types of ports	RS232 or RS485 (2-wire or 4-wire), depending on settings
Protocol	Modbus RTU/ASCII, PowerLogic (SY/MAX), Jbus
Maximum baud rate	57600
Maximum number of connected devices	64
Ethernet port	
Number of ports	1
Types of ports	One 10/100 base TX (802.3af) port
Protocol	HTTP, Modbus TCP/IP, FTP, SNMP (MIB II), SNTP, SMTP
Baud rate	10/100 Mb
Web server	
Memory for custom HTML pages	512 Mb

Installation

Din rail mounting



ION7550RTU
Functions and characteristics

PE86117

PowerLogic ION7550RTU.

The PowerLogic ION7550RTU (remote terminal unit) is an intelligent web-enabled device ideal for combined utilities metering of water, air, gas, electricity and steam (WAGES). When combined with PowerLogic software, the ION7550RTU offers a seamless, end-to-end WAGES metering solution. Featuring a large, high-visibility display and overall versatility of the PowerLogic system, the ION7550RTU provides extensive analog and digital I/O choices and is a cost-effective dedicated WAGES solution when compared to a traditional meter. The device automatically collects, scales and logs readings from a large number of connected meters or transducers and delivers information to one or more head-end systems through a unique combination of integrated Ethernet, modem or serial gateways. As part of a complete enterprise energy management solution, the ION7550RTU can be integrated with PowerLogic ION Enterprise software, or other SCADA, information and automation systems.

Applications

WAGES metering.
Data concentration through multi-port, multi-protocol communications.
Equipment status monitoring and control.
Programmable setpoints for out-of-limit triggers or alarm conditions.
Integrated utility metering with advanced programmable math functions.

Main characteristics

Increase efficiency
Reduce waste and optimise equipment operation to increase efficiency.

Easy to operate
Screen-based menu system to configure meter settings. Bright LCD display with adjustable contrast.

Integrate with software
Easily integrated with PowerLogic or other energy management enterprises, including SCADA systems.

Transducer and equipment condition monitoring
Versatile communications, extensive I/O points, clock synchronization, event logging and sequence of events recording capabilities for transducer and equipment condition and status monitoring at utility substations.

Set automatic alarms
Alarm setpoint learning feature for optimum threshold settings.

Up to 10 Mbytes of memory
For archiving of data and waveforms.

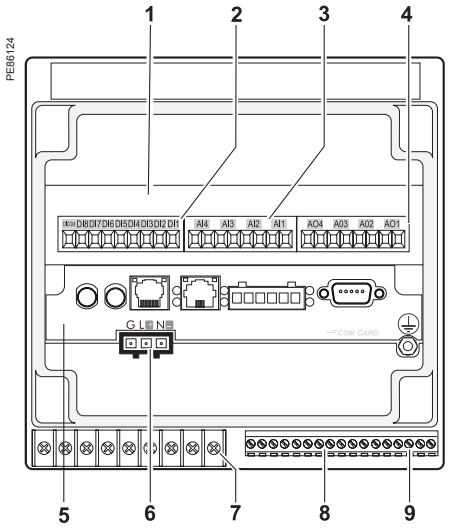
Notify alarms via email
High-priority alarms sent directly to the user's PC. Instant notification of power quality events by email.

Part numbers

ION7550RTU	
ION7550	**M7550**

See page 112 for order code explanations.

ION7550RTU
Functions and characteristics (cont.)



PowerLogic® ION7550RTU.

1 *I/O expansion card.*
2 *Digital inputs.*
3 *Analog inputs.*
4 *Analog outputs.*
5 *Communications card.*
6 *Power supply.*
7 *Form C digital outputs.*
8 *Digital inputs.*
9 *Form A digital outputs.*

Selection guide	ION7550RTU
Data recording	
Min/max of instantaneous values	■
Data logs	■
Event logs	■
Trending/forecasting	■
SER (Sequence of event recording)	■
Time stamping	■
GPS synchronisation (1 ms)	■
Memory (in Mbytes)	10
Display and I/O	
Front panel display	■
Pulse output	1
Digital or analogue inputs(max)	24
Digital or analogue outputs (max, including pulse output)	30
Communication	
RS 485 port	1
RS 485 / RS 232 port	1
Optical port	1
Modbus protocol	■
Ethernet port (Modbus/TCP/IP protocol)	1
Ethernet gateway (EtherGate)	1
Alarms (optional automatic alarm setting	■
Alarm notification via email (Meterm@il)	■
HTML web page server (WebMeter)	■
Internal modem	1
Modem gateway (ModemGate)	■
DNP 3.0 through serial, modem, and I/R ports	■

ION7550RTU
Functions and characteristics (cont.)

PE86117

PowerLogic ION7550RTU.

Electrical characteristics		
Data update rate		1/2 cycle or 1 second
Power supply	AC	85-240 V AC ±10% (47-63 Hz)
	DC	110-300 V DC ±10%
	DC low voltage (optional)	20-60 V DC ±10%
	Ride-through time	100 ms (6 cycles at 60 Hz) min. at 120 V DC
	Burden	Standard: typical 15 VA, max 35 VA Low voltage DC: typical 12 VA, max 18 VA
Input/outputs(1)	Standard	8 digital inputs (120 V DC) 3 relay outputs (250 V AC / 30 V DC) 4 digital outputs (solid state)
	Optional	8 additional digital inputs 4 analog outputs, and/or 4 analog inputs
Mechanical characteristics		
Weight		1.9 kg
IP degree of protection (IEC 60529)		IP52
Dimensions	Standard model	192 x 192 x 159 mm
	TRAN model	235.5 x 216.3 x 133.1 mm
Environmental conditions		
Operating temperature	Standard power supply	-20 to +70ºC
	Low voltage DC supply	-20 to +50ºC
	Display operating range	-20 to +70ºC
Storage temperature	Display, TRAN	-40 to +85ºC
Humidity rating		5 to 95% non-condensing
Installation category		III (2000m above sea level)
Dielectric withstand		As per EN 61010-1, IEC 62051-22A(2)
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 surges		IEC 61000-4-5
Conducted and radiated emissions		CISPR 22
Safety		
Europe		IEC 61010-1

(1) Consult the ION7550 / ION7650 installation guide for complete specifications.
(2) IEC 62051-22B with serial ports only.

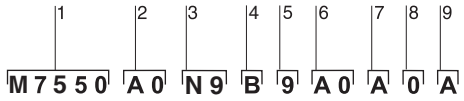
ION7550RTU
Functions and characteristics (cont.)

Communication	
RS 232/485 port (1)	Up to 115,200 bauds (57,600 bauds for RS 485), ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master
RS 485 port (1)	Up to 115,200 bauds, ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master
Infrared port(1)	ANSI type 2, up to 19,200 bauds, ION, Modbus, DNP 3.0
Ethernet port	10BaseT, 100BaseTX. RJ45 connector, 10/100 m link
Fibre-optic Ethernet link	100Base FX, SC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link
Protocol	ION, Modbus, TCP/IP, DNP 3.0, Telnet
EtherGate	Communicates directly with up to 62 slave devices via available serial ports
ModemGate	Communicates directly with up to 31 slave devices
WebMeter	5 customisable pages, new page creation capabilities, HTML/XML compatible
Firmware characteristics	
High-speed data recording	Down to 5ms interval burst recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined setpoint, or from external equipment.
Load profiling	Channel assignments (800 channels via 50 data recorders) are configurable for any measurable parameter. Trigger recorders based on time interval, calendar schedule, alarm/event condition, or manually.
Trend curves	Access historical data at the front panel. Display, trend and continuously update historical data with date and timestamps for up to four parameters simultaneously.
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 is possible using the operators NAND, OR, NOR and XOR
Advanced security	Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user privileges
Memory	5 to 10 Mbytes (specified at time of order)
Firmware update	Update via the communication ports
Display characteristics	
Integrated display	Back lit LCD, configurable screens
Languages	English

(1) All the communication ports may be used simultaneously.

ION7550RTU
Functions and characteristics (cont.)

PE86118

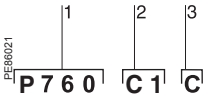


Sample ION7550RTU part number.

Part numbers

	Item	Code	Description
1	Model	7550	ION7550 device
2	Form Factor	A0	Integrated display with front optical port, 5 MB logging memory, and 512 samples/cycle resolution.
		B0	Integrated display with front optical port, 10 MB logging memory, and 512 samples/cycle resolution.
		T0	Transducer (no display) version, with 5 MB logging memory.
		U0	Transducer (no display) version, with 10 MB logging memory.
3	RTU option	N9	RTU option
4	Power Supply	B	Standard power supply (85-240 VAC, ±10%/47-63 Hz / 110-330 VDC, ±10%)
		C	Low voltage DC power supply (20-60 VDC)
5	Internal use	9	This field for internal use only
6	Communications	A0	Standard communications (1 RS-232/RS-485 port, 1 RS-485 port). Integrated display models also include 1 ANSI Type 2 optical communications port.
		C1	Standard communications plus 10BASE-T/100BASE-TX Ethernet (RJ-45), 56k universal internal modem (RJ-11). Ethernet, modem gateway functions each use a serial port.
		D7	Standard comms plus 10BASE-T/100BASE-TX Ethernet (RJ-45) and 100BASE-FX Ethernet Fiber, 56k universal internal modem (RJ-11). Ethernet and modem gateway functions each use a serial communications port.
		E0	Standard communications plus 10BASE-T/100BASE-TX Ethernet (RJ-45). Ethernet gateway function uses serial port.
		F1	Standard communications plus 10BASE-T/100BASE-TX Ethernet (RJ-45) and 100BASE-FX (SC fiber optic connection). Ethernet gateway uses a serial port.
		M1	Standard communications plus 56k universal internal modem (RJ-11). Modem gateway uses serial communications port.
7	I/O	A	Standard I/O (8 digital inputs, 3 Form C relays, 4 Form A solid-state outputs)
		D	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 1 mA analog inputs)
		E	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog inputs)
		H	Standard I/O plus Expansion I/O card (8 additional digital inputs & four -1 to 1 mA analog outputs)
		K	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog outputs)
		N	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog inputs and four 0 to 20 mA outputs)
		P	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 1 analog inputs and four -1 to 1 mA analog outputs)
8	Security	0	Password protected, no hardware lock
9	Special Order	A	None
		C	Tropicalisation treatment applied

ION7550RTU
Functions and characteristics (cont.)



Example order code. Use this group of codes when ordering the PowerLogic ION7550RTU communication or I/O card.

1 Communications or I/O card.
2 Type.
3 Special order.

	Communications Card		
	Item	**Code**	**Description**
1	Comm card	P765C	ION7550RTU communication card for field retrofit installations
2	Type	A0	Standard communications (1 RS-232/RS-485 port, 1 RS-485 port). Front optical port support for meters with integrated display.
		C1	Standard communications plus 10BASE-T/100BASE-TX Ethernet (RJ-45), 56k universal internal modem (RJ-11; the modem port is shared with the front optical port). Ethernet and modem gateway functions each use a serial communications port.
		D7	Standard communications plus 10BASE-T/100BASE-TX Ethernet, 100BASE-FX Ethernet Fiber, 56k universal internal modem (RJ-11; the modem port is shared with the front optical port). Ethernet and modem gateway functions each use a serial communications port.
		E0	Standard communications plus 10BASE-T/100BASE-TX Ethernet. Ethernet gateway function uses a serial communications port.
		F1	Standard communications plus 10BASE-T/100BASE-TX Ethernet, 100BASE-FX Ethernet Fiber (SC fiber optic connection). Ethernet gateway function uses a serial communications port.
		M1	Standard communications plus 56k universal internal modem (RJ-11; the modem port is shared with the front optical port). Modem gateway function uses a serial communications port.
3	Special order	A	None
		C	Tropicalization treatment applied

ION7550RTU
Functions and characteristics (cont.)

Part numbers (cont'd)

Input/Output expansion card

Item	Code	Description
I/O card	P760A	Expansion I/O for field retrofit installations.
Type	D	Expansion I/O card with eight digital inputs, four 0 to 1 mA analog inputs
	E	Expansion I/O card with eight digital inputs, four 0 to 20 mA analog inputs
	H	Expansion I/O card with eight digital inputs, four -1 to 1 mA analog outputs
	K	Expansion I/O card with eight digital inputs, four 0 to 20 mA analog outputs
	N	Expansion I/O card with eight digital inputs, four 0 to 20 mA analog inputs & four 0 to 20 mA outputs
	P	Expansion I/O card with eight digital inputs, four 0 to 1 analog inputs and four -1 to 1 mA analog outputs
Special Order	A	None
	C	Tropicalization treatment applied

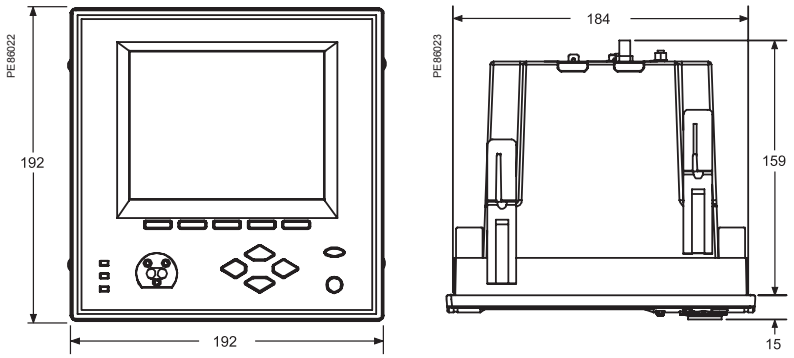
OpenDAC rack, controllers, power supply	
70LRCK16-48	OpenDAC rack. Holds up to 8 OpenLine modules to provide up to 16 I/O points. Requires communications controller
72-MOD-4000	OpenDAC OpenDAC RS-485 serial module. Communications controller for use in a Modbus RTU network. Supports up to 2 70LRCK16-48 OpenDAC racks
72-ETH-T000	OpenDAC Ethernet network module for use on an Modbus/TCP Ethernet network. Supports up to 2 OpenDAC racks
PS-240-15W	85-264VAC/110-370VDC 15 Watt power supply. Required for applying power to the racks and controllers

OpenLine digital I/O modules	
70L-IAC	digital input, 120VAC
70L-IACA	digital input, 220VAC
70L-IDC	digital input, 3-32VDC
70L-IDCB	digital input, fast switching
70L-IDCNP	digital input, 15-32VAC/10-32VDC
70L-IDC5S	dry contact closure-sensing DC input
70L-ISW	input test module
70L-OAC	digital output, 120VAC
70L-OACL	digital output, 120VAC inductive loads
70L-OACA	digital output, 220VAC
70L-OACAL	digital output, 220VAC inductive loads
70L-ODC	digital output, 3-60VDC fast
70L-ODCA	digital output, 4-200 VDC
70L-ODCB	digital output, fast switching
70L-ODC5R	digital output, dry contact

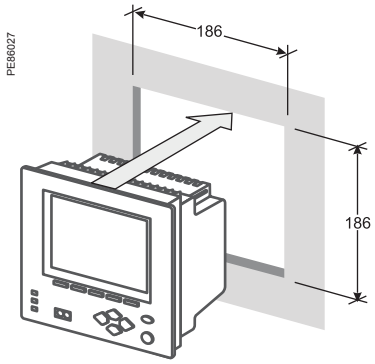
OpenLine analog I/O modules	
73L-II020	analog input, current, 0-20mA
73L-II420	analog input, current, 4-20mA
73L-ITCJ	analog input, temperature, J-type TC
73L-ITCK	analog input, temperature, K-type TC
73L-ITCT	analog input, temperature, T-type TC
73L-ITR100	analog input, temperature, RTD
73L-ITR3100	analog input, temperature, 3wire RTD
73L-ITR4100	analog input, temperature, 4wire RTD
73L-IV1	analog input, voltage, 0-1VDC
73L-IV10	analog input, voltage, 0-10VDC
73L-IV10B	analog input, voltage, -10 to 10VDC
73L-IV100M	analog input, voltage, 0-100VDC
73L-IV5	analog input, voltage, 0-5VDC
73L-IV5B	analog input, voltage, -5 to 5VDC
73L-IV50M	analog input, voltage, 0-50mV
73L-OI020	analog output, current, 0-20mA
73L-OI420	analog output, current, 4-20mA
73L-OV10	analog output, voltage, 0-10VDC
73L-OV10B	analog output, voltage, -10 to 10VDC
73L-OV5	analog output, voltage, 0-5VDC
73L-OV5B	analog output, voltage, -5 to 5VDC

ION7550 RTU
Installation and connection

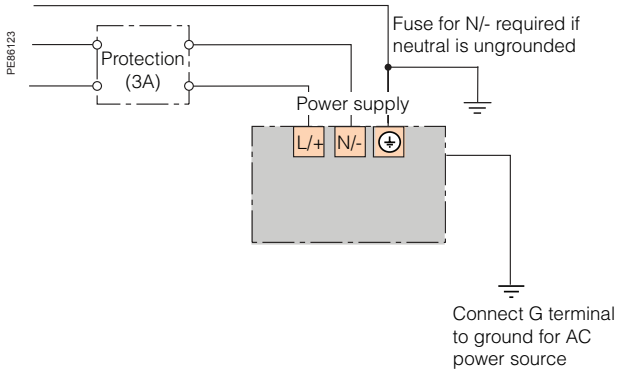
ION7550RTU dimensions



Front-panel mounting



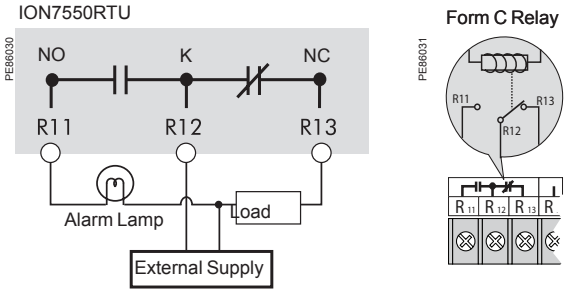
Power supply



Note: *the current and voltage terminal strip (I52, I51, I42, I41, I32, I31, I22, I21, I12, I11, V4, V3, V2, V1, Vref) is not present on the RTU.*

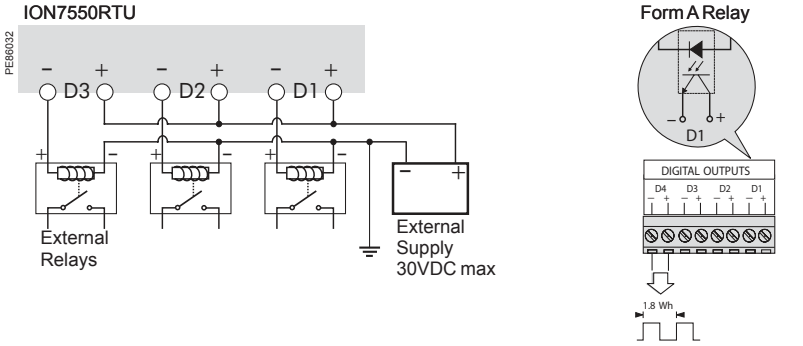
ION7550 RTU
Installation and connection (cont.)

Form C digital outputs: mechanical relays R1 - R3



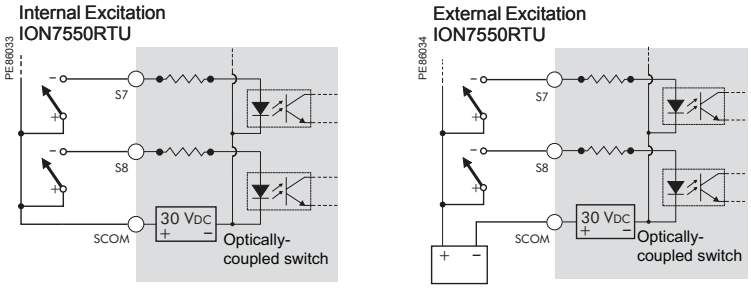
Note: Mechanical relays should always be protected by external fuses

Form A digital outputs: solid state relays D1 - D4



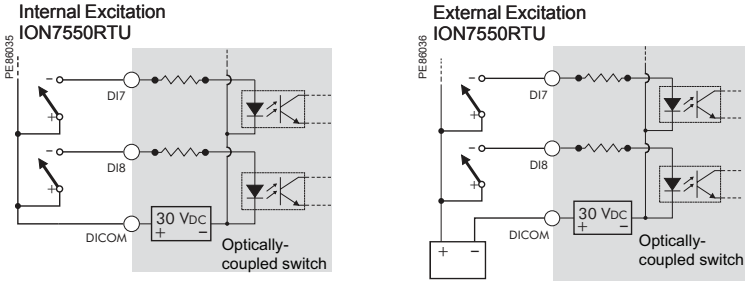
Note: D4 output is factory-configured to pulse once every 1.8 Wh for Class 20 meters, or once every 0.18Wh for Class 2 meters (for calibration testing purposes).

Digital inputs: S1 - S8



Note: External Supply = 130 VDC max

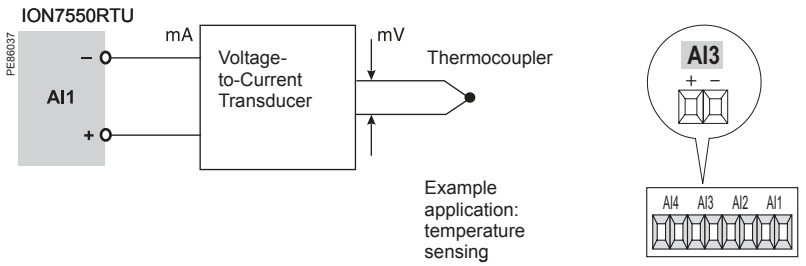
Digital inputs: DI1 - DI8 (option)



Note: External Supply = 50 VDC max

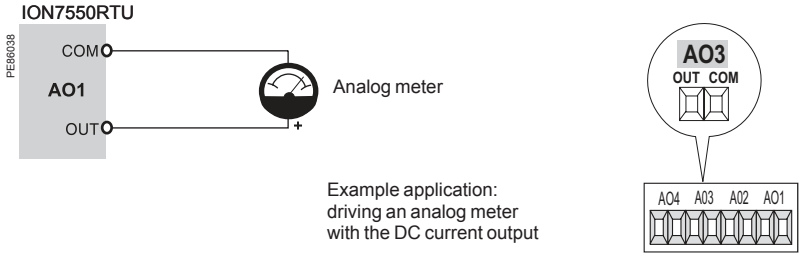
ION7550 RTU
Installation and connection (cont.)

Analog inputs: AI1 to AI4 (option)



Note: do not connect the analog inputs of the I/O card to the analog outputs on the same I/O card.

Analog outputs: AO1 to AO4 (option)



Note: do not connect the analog inputs of the I/O card to the analog outputs on the same I/O card.

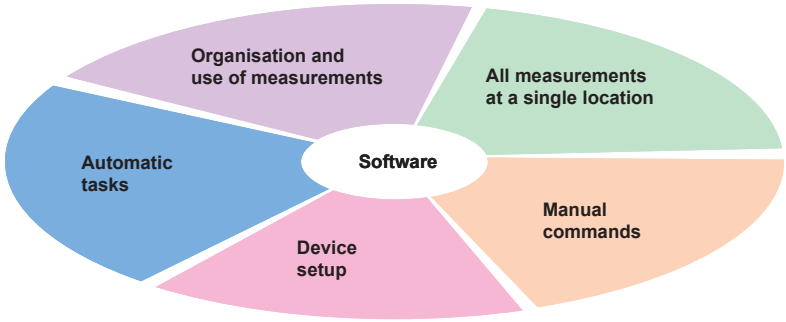
General information on power-monitoring software

Software, a tool serving site operation.
A site can be compared to a living organism.
The power system manager has no control over the changes that affect this organism, but must ensure that it continues to receive the energy it requires.
Similar to a doctor, the power system manager must carry out preventive measures and diagnose and remedy any problems that occur. The goal is to maintain the site in a healthy state, without generating any secondary effects.
Software enables managers to diagnose the causes of most problems encountered on electrical systems.

More and more devices are capable of communicating.
The number of available measurements is also on the rise, creating the need for a tool to successfully manage all the information.
The main purpose of software is to simplify complex sites so that they can be managed by humans:
- make the site and its operation intelligible
- make the power system tangible and visible.

The role of software

DB122552



All measurements at a single location

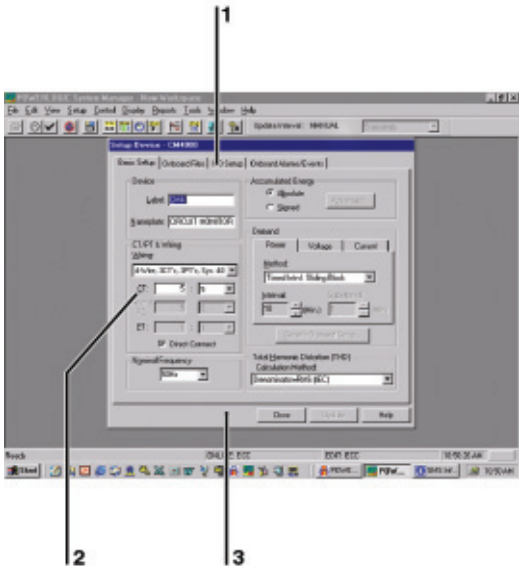
All measured values may be accessed via a PC.

Organisation and use of measurements

Before they may be used, certain measurements must be organised, processed or integrated in special tools.

Examples
- organisation:
  - organisation in tables
  - visual presentation (bar charts, meters)
  - etc.
- processing:
  - classing of events from different devices in chronological order
  - etc.
- tools:
  - display in curve form (selection of intervals, magnifying glass, changes in presentation, etc.).

DB101064



Circuit Monitor setup.

1 *Tabs for access to advanced-function settings.*
2 *CT and VT settings.*
3 *Setup screen for Circuit Monitor basic settings.*

Device setup

Simple devices may be set up on their front panels.
For devices with advanced functions, local setup is often difficult and even impossible for some functions.
Software greatly facilitates device setup.

General information on power-monitoring software (cont.)

Automatic tasks

Software can execute tasks automatically, triggered by:
- a date
- an event
- an alarm.

These tasks may concern devices (reset, start of a particular function) or system users (transmission of an e-mail, etc.).

Manual commands

Power-monitoring software can also be used to control devices (e.g. open or close a circuit breaker).
Certain control/monitoring functions (automatic action on electrical-distribution system) are carried out by PLCs integrated in the PowerLogic System architecture.

Access via the Web

Information must be adapted to user needs and then made available to them.
Software can handle the adaptation by preparing custom reports.
These reports can then be accessed by any PC on the site using a standard Web browser.

Software and architecture

Software must be capable of meeting a large number of needs:
- single-user or multi-user operation
- data organisation according to user profiles
- adaptation to different site topologies
- data exchange with other systems
- etc.

This set of constraints means that a single product is not sufficient; a range of software products is required.

PowerView

PE86106-c

PowerLogic™ PowerView™.

PowerLogic™ PowerView™ v2.0 is an easy-to-use, entry-range power monitoring solution ideally suited for small system applications. The software polls the network for compatible PowerLogic devices, simplifying system and device configuration. Connection and data logging begins automatically at factory preset intervals, settings which are easily changed by the user. PowerView allows users to track real-time power conditions and perform remote monitoring of electrical equipment or installations at key distribution points across an electrical network.

Use logged values to reveal energy waste, unused capacity and historical trends. The software's Report Builder includes time of use configurations, allowing the user to create reports with energy and demand values for time periods with specific billing requirements. Power costs can be allocated to departments or processes. Generated reports publish in Microsoft Excel for easy data access and custom reporting. PowerView is a cost-effective power monitoring solution and a key first step towards a comprehensive energy intelligence strategy.

PowerView is compatible with the following devices:
PM9C, PM710, PM750, PM800 series and Enercept meters, as well as circuit breaker trip units Micrologic A, P, H, and Compact NSX A and E.

See page 123 for details of actual parameters logged.

Applications

■ Power consumption monitoring: use historical data for trend information; plan expansion based on actual usage; avoid over-design and use an electrical system to its full capacity.
■ Cost allocation: track power-related costs for building, process, or tool; create time-of-use energy profiles.
■ Equipment monitoring: monitor electrical equipment or installations at key distribution points across the network; monitor for pending problems or scheduled maintenance.
■ Strategic planning: use logged values of current, voltage, power, power factor, energy, demand power, demand current to develop strategies to avoid interruptions.
■ Preventative maintenance: proactively manage the power system; base maintenance schedule on actual operating history.

Functions

■ PowerView offers a wide range of functions:
■ Automated data acquisition from compatible devices
■ Real time viewing of data
■ Historical tabular data into Microsoft Excel
■ Historical trending
■ Reporting
■ TCP/IP, serial communications
■ Pre-defined meter onboard data log retrieval
■ Microsoft SQL2005 Express-Advanced data warehouse
■ Backup/restore database management.

Part numbers

PowerView software (1)	
English	**PLVDEVKITENG**
French	**PLVDEVKITFRA**
Spanish	**PLVDEVKITESP**

(1) These are the internal part numbers Schneider Electric country organizations should use when ordering PowerView.

PowerView (cont.)

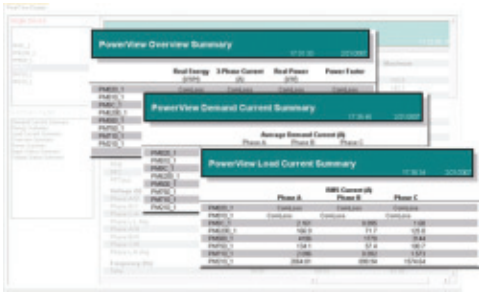
PE86192-c

Automatically detect and add up to 32 compatible PowerLogic devices.

Automatic device acquisition and data integration

■ PowerLogic PowerView uses industry-standard Modbus TCP/IP and RS-485 (2 wire or 4 wire) protocols to interface with devices.
■ Easy-to-use device setup component polls the network and detects supported devices; select up to 32 devices to add to the system – or manually add/delete device connections.
■ Onboard meter or PC-based historical logging (depending upon device capabilities) begins automatically at default or user-defined intervals.
■ Microsoft SQL2005 Express-Advanced database with backup/restore capabilities for reliable database management.

PE86109-c



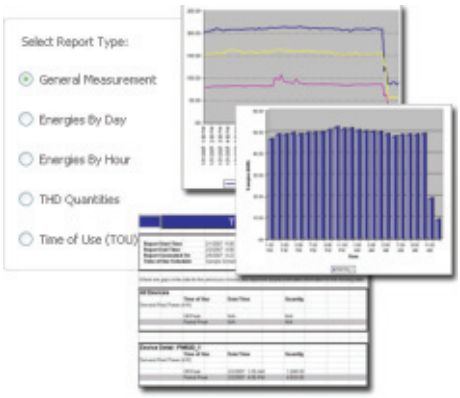
Desktop access to power system information from any department, building or region. Graphical views of relevant, actionable information.

Real-time monitoring

■ Real Time Display shows data from devices monitoring key distribution points in the electrical system. Measured quantities include current, voltage, power, power factor, energy, demand power, demand current, and total harmonic distortion (THD).
■ Display real-time power and energy measurements and historical trends.
■ View data by single device or view and compare real time data from multiple devices.
■ Real-time summary views:
□ Demand current – view the amount of electricity consumed over time.
□ Energy – view measured kilowatt-hours for sub-billing or comparison purposes.
□ Load current – measure the current required to supply load demands.
□ Overview – view the real energy (kWH), 3-phase current (A), real power (kW) and power factor of connected devices.
□ Power – measure the rate energy is drawn from electrical system (watts).
□ Input status summary – check the input status of I/O-capable devices.
□ Output status summary – check the output status of I/O-capable devices.

PowerView (cont.)

PE86110-c

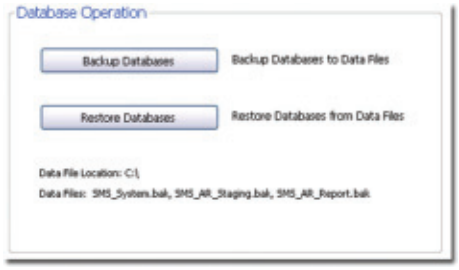


Support load studies or expansion planning, optimize equipment use by maximizing capacity or balancing loads. Reveal critical trends, expensive processes or energy waste.

Reporting

■ Use Report Builder to build and generate reports in a few clicks.
■ Standard reports include:
□ General measurement – trend patterns for electrical energy usage, power demand or any other logged parameter. These reports include the referenced data points of the trend. Leverage these values in Excel to create detailed reports, enable further analysis and reveal true business conditions.
□ Energies by day; energies by hour – analyze measured kilowatt-hours for cost allocation or comparison purposes.
□ THD quantities – measure, analyze and compare total harmonic distortion
□ Time of Use (TOU) – define up to 3 TOU schedules each with 10 periods for energy accumulation; supports weekends, special days, holidays.
■ Report Builder publishes the reports in Microsoft Excel.

PE86111-c



PowerView includes robust Microsoft SQL2005 Express-Advanced database management.

Database management

■ Microsoft SQL2005 Express-Advanced database management includes:
■ Database backups
■ Database restores
■ Historical database management
■ Maintained below 2.9GB in size.

Computer requirements

■ 5 GB Hard Drive free space.
■ 512M RAM Memory.
■ 800MHz Pentium 3 class (or equivalent).

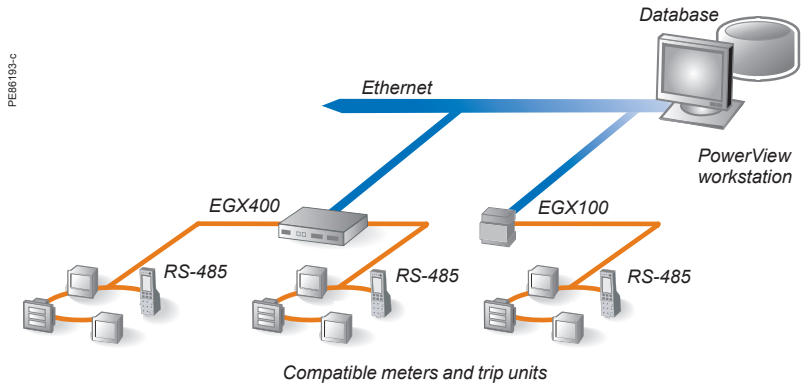
Microsoft Windows operating systems supported

■ MS Windows 2000 Workstation Edition SP4.
■ MS Windows XP Professional Edition SP2.
■ MS Vista.

Microsoft Office required

PowerLogic PowerView requires one of the following versions of MS Office installed on each workstation running PowerView:
■ Office 2000
■ Office XP
■ Office 2003
■ Office 2007

PowerView (cont.)

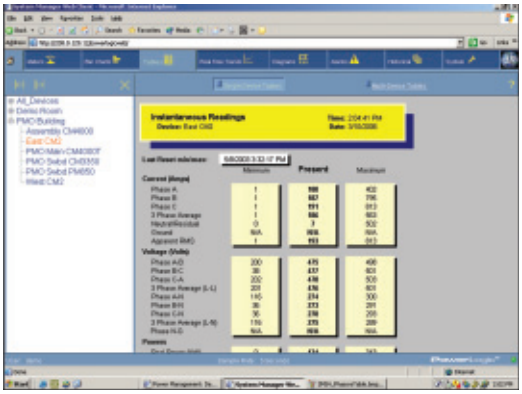


Compatible meters and trip units

Parameters	PM9C	PM200	Micrologic A, P, H	PM500	ION6200	PM750 PM710	PM800 series	Enercept	Compact NSX
Phase current (A, B, C)	■	■	■	■	■	■	■	■	■
Phase voltage (AN, BN, CN)	■	■	■	■	■	■	■	■	■
Line voltage (AB, BC, CA)	■	■	■	■	■	■	■	■	■
Power factor total	■	■	■	■	■	■	■	■	■
Real energy (kWh)	■	■	■	■		■	■	■	■
Reactive energy (kVARh)	■	■	■	■		■	■		■
Real power total (kVAR)	■	■	■	■	■	■	■	■	■
Apparent power total (kVA)	■	■	■	■	■	■	■		■
Demand real power total (kWd)	■	■	■	■	■	■	■		■
Demand reactive power total (kVARd)		■	■	■	■	■	■		■
Demand apparent power total (kVAd)		■	■	■	■	■	■		■
Demand current (A, B, C)		■	■	■	■	■	■		■
Neutral current	■			■	■	■	■		■
Apparent energy (kVAh)		■	■	■	■	■	■		■
THD phase voltage (AN, BN, CN)				■	■	■	■		■
THD current (A, B, C)				■	■	■	■		■

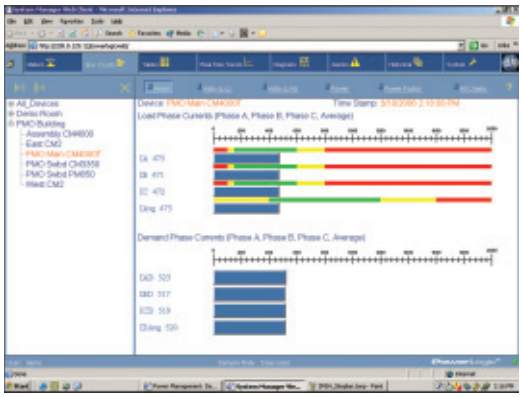
System Manager Software

DB119014



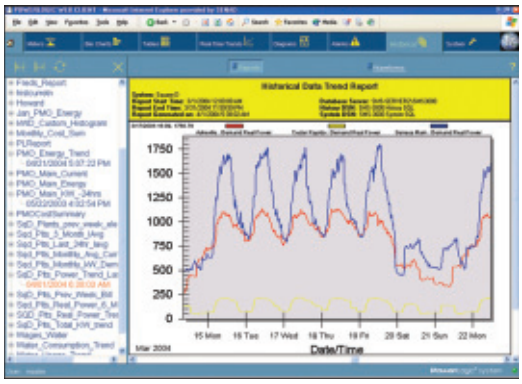
Tables: instantaneous readings.

DB119015



Bar charts: load phase currents.

DB119016



Historical: data trend report.

DB119017

Alarms.

PowerLogic® System Manager Software (SMS) is a full featured, web-enabled product family. With standard intuitive views, SMS ensures a consistent power and utility monitoring experience. Upon installation, the system is online and ready to display and record monitored information in a wide variety of predefined views, including over 50 real-time tables, analog meters and bar charts, an alarm log with waveform links, pre-engineered power quality and utility cost reports, and more. You can also tailor SMS to meet your own needs, with customised screens, trends and reports that are automatically incorporated into the tabbed navigational user interface.

- Simultaneous remote connections from any browser-equipped computer on your network - no client software required
- Intuitive tabbed interface for quick system navigation
- Real-time data and report sharing with secure access to information
- Remote alarm notification to email, pagers, and other remote devices
- Distributed monitoring and automatic data collection to eliminate nuisance data gaps
- Open system architecture with industry standard protocols and support for a plethora of intelligent monitoring devices.

System Manager Software Product Family

The System Manager software product family is comprised of three, full-featured software applications designed to meet the power monitoring needs of small-systems, with fewer than sixteen devices, to large, enterprise systems with hundreds of devices.

System Manager DL (SMSDL)

- Web-enabled product for small systems
- One browser connection (upgradeable to 6) for local or remote data display
- 16 device limit (upgradeabe to 32)
- 4 Gigabyte SQL Express database
- Information Manager reports.

System Manager Standard (SMSSE)

- Intermediate level product for intermediate systems (typically 64 or fewer devices)
- One browser connection (upgradeable to 6) for local or remote data display
- Unlimited devices
- 4 Gigabyte SQL Express database
- Information Manager reports.

System Manager Professional (SMSPE)

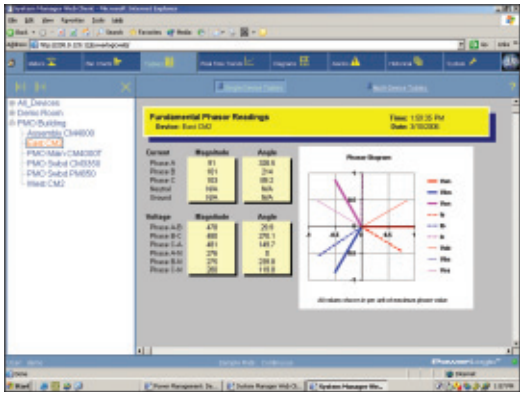
- Enterprise level product for large systems
- 10 simultaneous browser connections
- Local and remote system and device setup
- Unlimited devices
- SMS Advanced Reports for web-based viewing and creation of reports
- SQL Server 2005 database (no size constraint).

Part numbers

Core Software Products	
System Manager DL 4.2 (16 device support; 1 browser client; 4 Gbytes data storage)	**SMSDL**
System Manager standard 4.2 (no device limit; 1 browser client; 4 Gbytes data storage)	**SMSSE**
System Manager Professional 4.2 (no device limit; 10 browser clients; unlimited data storage)	**SMSPE**
Add-on Products	
OPC server application for SMS 4.2	**SMSOPC**
Extension Products	
Adds five additional web client connections to SMSDL, SMSSE and SMSPE	**SMSWebXTR**
Extends SMSDL device limit to 32	**SMSDL32U**
Upgrade SMSDL to SMSSE	**SMSDL2SE**

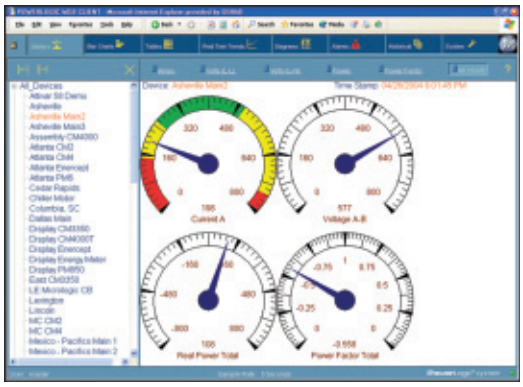
System Manager Software (cont.)

DB119018



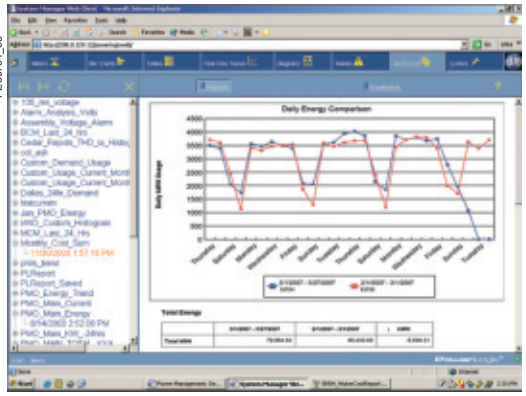
Tables: fundamental phasor readings.

DB119019



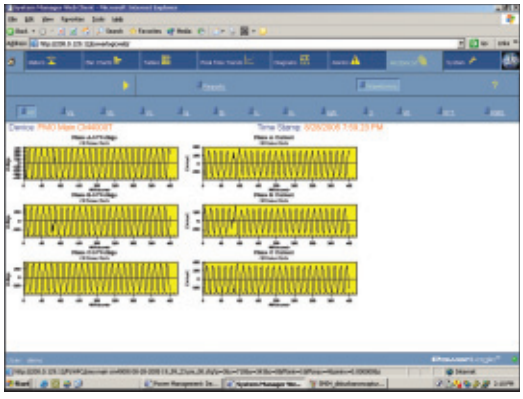
Meters: analog meters.

PE50764_68



Historical: electrical cost summary.

DB119020



Historical: disturbance capture.

Functions

SMS offers a wide range of functions:

- ■ simple pre-configured functions:
- □ data tables and real-time trending charts
- □ meters and bar charts
- □ historical logging and trending
- □ display of waveforms
- □ harmonic analysis
- □ event logging
- □ min/max resetting
- □ control
- □ device setup
- ■ advanced functions that the users can customise:
- □ user-defined tables and reports
- □ setup of automatic tasks
- □ graphic interface customised

Data tables, meters and bar charts

SMS can supply a wide range of measurements in real time via tables, bar charts or meters.
SMS is pre-configured to accept and display the data supplied by the devices.
Users can also create their own customised tables and run-time trends.
Simply select one or more devices, the desired measurements, and the table is created automatically.

Historical logging and trending

SMS automatically saves the data from the devices to a central data base.
The data can be retrieved, displayed or printed as tables, trend curves or reports.

Waveform display and harmonic analysis

The data is presented in graphs.
The current and voltage waveforms may be viewed simultaneously or individually, and can be printed.
If the waveform capture is over four cycles, it is possible to display the percentage of each harmonic order and the total harmonic distortion (THD).

Event logging

SMS logs all events including alarms.
Events may be of any type, from power outages to configuration changes.
All user action on the system is recorded and can be displayed, printed or deleted at all times.
For each event, the following fields are displayed on the screen:

- ■ device
- ■ date and time
- ■ type of event
- ■ user name.

This make it possible to recover all the necessary information for system diagnostics.

SMS can be used to link alarms to digital and analog inputs in addition to those that can be set up directly on certain devices.
User-set values can be used as alarm conditions.
The alarm parameters can be set with a number of security levels.
Each level corresponds to audio and visible indications, a password and actions.
Each level can be set up with different sounds, colours, actions, etc.

Management of user rights

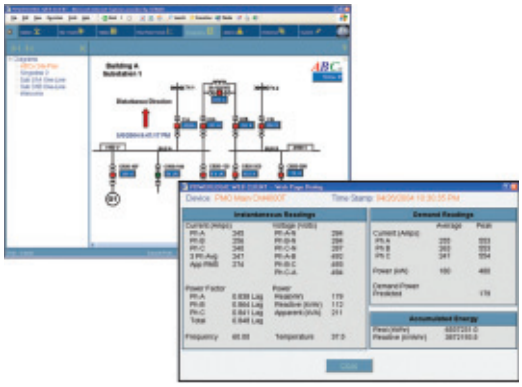
SMS can handle an unlimited number of users, each with their own name and password.
In addition, SMS manages different levels of user rights to restrict access to strategic functions.

Control

SMS can be used to control devices (e.g. opening and closing of circuit breakers).
To avoid accidental and unauthorised use, only users with appropriate rights can access this function.
SMS can also be used to reset min/max values stored in the devices.

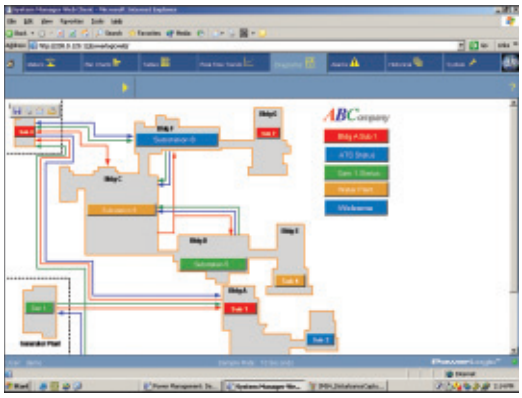
System Manager Software (cont.)

DB119021



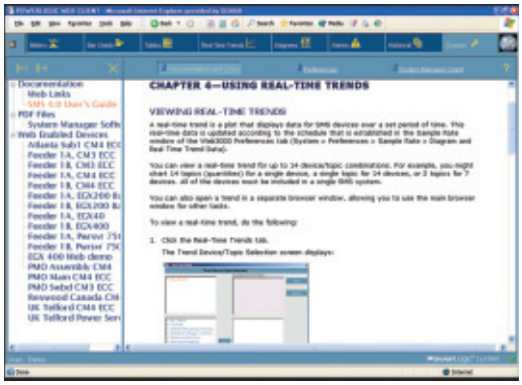
Diagrams: single-line diagram and device summary.

DB119022



Diagrams: building diagram.

DB119023



System: documentation and links.

Creation of custom reports with SMSDL, SMSSE and SMSPE
SMS can be used to create reports from all types of data, including real-time values. SMS can use standard or user-customised report formats.

Creation of Advanced Reports with SMSPE
Advanced Reports supports multitude of standard output formats including Adobe, Word, Excel, Crystal Reports and HTML.
From a remote computer, run, schedule, edit, export, e-mail and manage historical reports via the PowerLogic Web interface.
Use the easy wizard for report creation and access on-demand report templates.
Advanced Reports auto-builds queries to the Microsoft SQL Server database, so no database experience is required.
Quickly access specific energy efficiency reports, pre-defined energy analysis reports and reports by shift, per circuit reports, multiple location reports, time of use reports or cost summary reports.

Automatic tasks
The available tasks include launching programs, resetting devices, sending e-mail, data acquisition and waveform capture.
A task may be launched when an alarm is detected or at a precise time set by the user.

Animated graphics
The GFX interactive graphics component offers a wide range of presentations, including single-line diagrams, electrical switchboards and site and building diagrams.
GFX offers complete customisation functions for these graphic presentations.

Organisation in groups
The devices can be organised in groups which makes it possible to select them according to function or the organisation of the electrical-distribution system.
This function makes it possible to logically structure the devices and data, e.g. by building, by voltage level, by function, etc.

Device setup, example of a Circuit Monitor
Simple devices may be set up on their front panel.
For devices with advanced functions, local setup is difficult and even impossible for some functions.
Software greatly facilitates device setup.

OPC option
SMS integrates data from building automation and other systems via the OPC options.

Help system
SMS comprises a complete, on-line help system that takes into account the screen where help is needed.
The help is divided into chapters that may be printed. Most of the configuration dialog boxes include a help button offering direct access to the information on the concerned dialog.

System Manager Software (cont.)

Selection guide

Products features	SMSDL	SMSSE	SMSPE
Devices			
System Support: PowerLogic and Modbus™/ Modbus TCP compatible devices	■	■	■
Number of device conections	16 (up to 32 with SMSDL32U)	Virtually unlimited	Virtually unlimited
System and device setup: PowerLogic metering and monitoring devices	Local	Local	Local and remote
Data acquisition			
Database	SQL Express	SQL Express	SQL Server
Data storage limit	4 Gbytes	4 Gbytes	Unlimited
Automatic onboard file upload	■	■	■
Web-Enabled Monitoring			
Pre-defined meters, tables and bar chart real time displays	■	■	■
Real time trend, trending/forecasting and power quality pass//fail analysis	■	■	■
Historical trending and pre-defined reports	■	■	■
Alarm notification with disturbance direction detection	■	■	■
Waveform capture analysis-transient detection, disturbance, FFT, RMS	■	■	■
Viewing and emailing pre-defined and user-defined reports	■	■	■
Report creation and scheduling	Local	Local	Local and remote
Control outputs	Local	Local	Local and remote
Interactive graphics	■	■	■
Advanced reports	-	-	■
Add-on products			
Extension of SMSDL to 32 devices connections (with SMSDL32U)	Add-on	-	-
Extra Web client: five additional connections (with WEBXTR)	Add-on	Add-on	-
OPC server for SMS 4.2 (with SMSOPC)	Add-on	Add-on	Add-on
Upgrade SMSDL to SMSSE (with SMSDL2SE)	Add-on	-	-
Web-enabled			
Secure login to protect information misuse	■	■	■
No training required, browser interface - provides access information remotely through any computer with network access	■	■	■
Full featured viewing capabilities with simultaneous browser connections	1 (up to 6 with WEBXTR)	1 (up to 6 with WEBXTR)	10 (1)

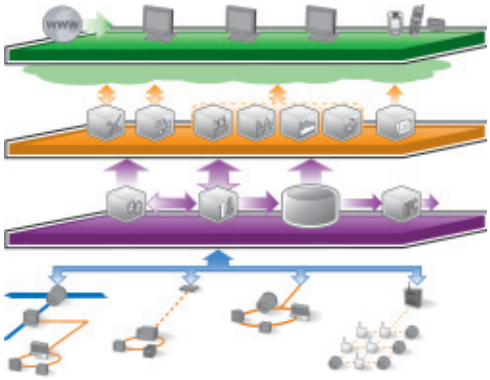
(1) Licensed for 10 browser connections. Additional licenses can be purchased. SMSPE has been tested for 30 simultaneous browser connections.

ION Enterprise®
Functions and characteristics

PE86096

PowerLogic® ION Enterprise®.

PE86097



Functional components of ION Enterprise.

PowerLogic ION Enterprise software is a complete power management solution for utility, industrial or commercial operations. Engineering and management personnel can cut energy-related costs, avoid downtime, and optimise equipment operations by using the information provided by PowerLogic ION Enterprise software. PowerLogic ION Enterprise also enables tracking of real-time power conditions, analysis of power quality and reliability, and quick response to alarms to avoid critical situations. The software forms a layer of energy intelligence across your facility, campus, service area, or your entire enterprise, acting as a unified interface to all electrical and piped utilities.

Typical applications

PowerLogic ION Enterprise software has many applications:

- Enterprise-wide energy consumption management.
- Cost allocation and bill estimation.
- Demand and power factor control.
- Load studies and circuit optimisation.
- Preventive maintenance.
- Equipment monitoring and control.
- Power quality and reliability analysis.

Software architecture

Data presentment

PowerLogic ION Enterprise offers enterprise-wide, multi-user data and control access through a local server interface, a thin-client web browser, or terminal services with tiered security.

Functional components

The functional components of the PowerLogic ION Enterprise software can reside on the main server or on one or more workstations.

- Management Console
  - Use this component to configure your PowerLogic ION Enterprise network, including communication paths, devices and logical groups.
- Designer
  - Designer allows you to customise the modular functionality of your ION devices and Virtual Processors.
- Vista
  - Offers real-time displays of measurements and status indicators; power quality analysis; historical trending; alarms; and manual control.
- Reporter
  - Produces predefined or custom reports and offers support for third-party reporting tools.

Data acquisition and management

- Virtual Processor
  - The Virtual Processor performs multi-site aggregation; coordinated control; complex calculations and alarming; and logging for non-recording devices (e.g. interval kWh).
- Site Server
  - Continuous or scheduled retrieval of data from up to hundreds of remote devices over Internet, Ethernet, telephone, serial, wireless, or satellite connections.
- SQL ODBC-compliant databases
  - SQL Server 2005 SP2 (Standard Edition, Express Edition). Log device data, system data and events with accurate meter synchronisation (+ 16 ms or +1 ms using GPS) for precise event timestamping, power quality analysis and revenue billing. This data is accessible using industry-standard database tools and you can add distributed databases and servers for load balancing.
- OPC DA (client), OPC DA Server (optional), and PQDIF Exporter (optional)
  - Supports data import/export with compliant devices and systems.

ION Enterprise®
Functions and Characteristics (cont.)

PE86098

Connect to meters, sensors, controllers, web services and other systems. Extract values from spreadsheets to combine with dynamic power and energy calculations.

Functions

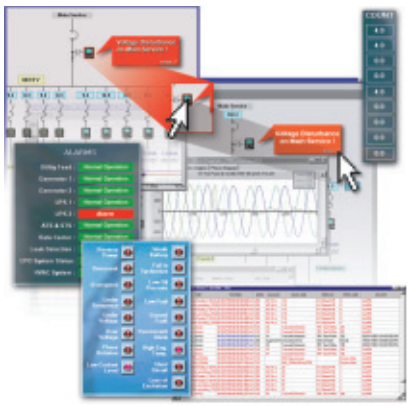
PowerLogic ION Enterprise offers a wide range of functions:

- Data acquisition and integration.
- Alarms and events.
- Manual and automated control.
- Real-time monitoring.
- Reporting.
- Trend analysis.
- Power quality analysis.
- Patented ION® technology.

Data acquisition and integration

Integrate metering of electricity and other consumed services such as gas, steam, air, and water. Native, out-of-the-box support for all PowerLogic ION series, PowerLogic PM800 series, PM750, PM710 and PM210 power and energy meters as well as PowerLogic CM3250, CM3350, CM4000, CM4250, CM4000T, circuit monitors, Micrologic Compact NSX Type A and Type E breakers, MicroLogic A, P and H circuit breaker control units, and the PowerLogic BCPM, branch circuit power meter. Also supports legacy ACM series meters. Enables access to meter data, control of on-board relays and digital outputs, remote configuration and firmware upgrading. Interface with third-party meters, transducers, PLCs, RTUs and power distribution or mitigation equipment. Quickly add and configure direct communications with remote devices over Modbus RTU or Modbus TCP protocols using easy-to-use device templates. Scalable platform enables remote devices and user clients to be added as needs grow while maintaining your original investment. Integrate with other energy management or automation systems (e.g. SCADA, BAC, DCS, ERP) through ODBC, XML, OPC, email, FTP, CSV and PQDIF compliance; integrate with web services through XML.

PE86099



Respond to a notification, then click an on-screen indicator to retrieve the time, location, and nature of the event. Click again to study waveforms, tolerance curves or a report.

Alarms and events

PowerLogic ION Enterprise software allows you to receive alerts to outages or impending problems that could lead to equipment stress, failures, or downtime. You can configure alarms to trigger on power quality events, power thresholds, or equipment conditions. Meter-based alarms can be immediately pushed to the software without waiting for system polls and can be annunciated through operator workstations, pagers, email, cell phones or PDAs using messages customised for the task. The software logs complete information on an event, including related coincident conditions, all with accurate timestamps. You can schedule maintenance based on operating history, events, and alarms.

PE86125

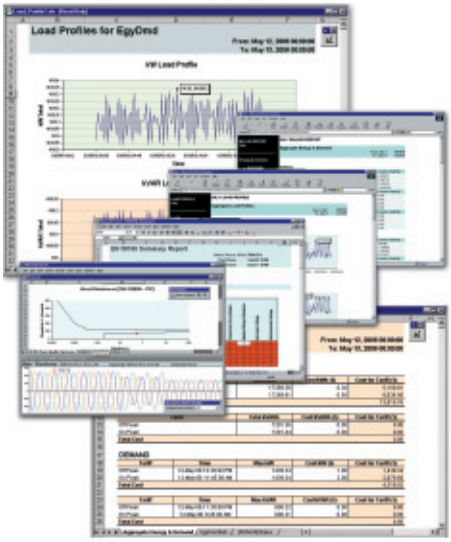
Control loads, generation, and power quality mitigation equipment across your enterprise or service area. Optimise switching with the latest status and base loading data.

Manual and automated control

Perform fast, manual control operations by clicking on-screen trigger buttons, and operate remote breakers, relays, and other power distribution and mitigation equipment. The Virtual Processor gathers data from multiple devices and incorporates process variables, as well as initiates automatic, coordinated control actions if predefined thresholds are exceeded. PowerLogic ION Enterprise software supports a wide range of applications. It allows you to manage distributed generation assets, as well as to shed loads or start up peak-shaving generators in response to interruptible rates, real-time pricing, or to avoid setting a new peak demand. You can gain control over capacitor banks to correct power factor, and improve energy efficiency and avoid penalties. The software also allows you to start fans to prevent transformer overheating if total harmonic distortion is too high.

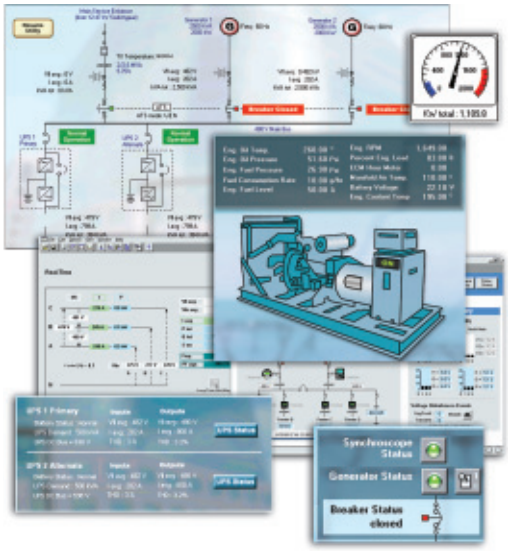
ION Enterprise®
Functions and characteristics (cont.)

PE86101



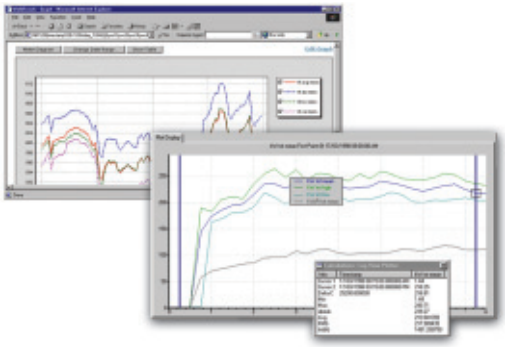
Desktop access to power system information from any department, building or region. Graphical views of relevant, actionable information customised for each user.

PE86102



Allocate costs, consolidate billing or negotiate contract volume pricing. Assure compliance with PQ standards and verify the results of operational improvements.

PE86103



Support load studies or expansion planning, optimise equipment use by maximising capacity or balancing loads. Reveal critical trends, expensive processes or energy waste.

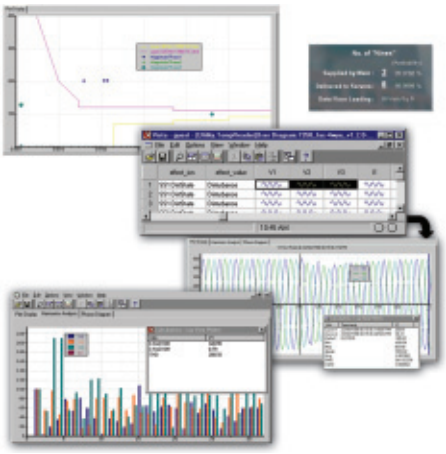
Real-time monitoring
View, from any local or globally located workstation, key distribution points across one or more facilities or substations. Display real-time power and energy measurements, historical trends and data logs, alarm conditions, equipment status (on/off, temperature, pressure, etc.), control triggers, and analysis tools. Use the Virtual Processor to perform sophisticated data computations, then display and log derived values. Select pre-configured diagrams or easily create customised views comprising digital readouts, dials, bar or trend graphs, one-line or elevation diagrams, maps, photos, and animation. Set up hyper-links between diagrams, then use easy point-and-click navigation to reveal deeper layers of detail. Group relevant measurements, indicators and controls into a library of convenient views, and easily extract and analyse selected ranges of information from the database using a query wizard.

Reporting
Reports can be generated manually, on schedule or event-driven. Distribute automatically as email or HTML. Generate reports through Microsoft Excel™ using a fast and convenient report wizard interface. Standard reports include: aggregate energy and demand reports, which combine multiple feeds and costs for each tariff period over requested intervals, matched to utility billing structures, with multi-year scheduling and time-of-use activity profiles; aggregate load profile reports, which show system-wide usage patterns over the specified date range, including timestamps and peak usage; IEC 61000-4-30 and EN50160 compliance reports, with pass/fail indicators to help you quickly assess system power quality levels, including flicker; and power quality analysis reports, which show disturbance waveforms, voltage tolerance curves, and harmonic histograms.

Trend analysis
Use PowerLogic ION Enterprise software to generate one or more trend graph overlays for interpretation of data using simple visual analyses. Perform trending on any measured parameter: voltage, current, power factor, demand, predicted demand, energy, harmonics, temperature, etc., and create usage profiles to reveal demand peaks, dangerous trends or unused capacity. Graph aggregate load profiles from multiple metering points or compare related parameters from across your enterprise. Track system-wide energy-related costs for each building, feeder, process, or tool.

ION Enterprise®
Functions and characteristics (cont.)

PE86104



Minimise equipment damage and downtime by pinpointing the source of disturbances, verifying the effect of system upgrades, and validating compliance with power quality standards.

Power quality analysis

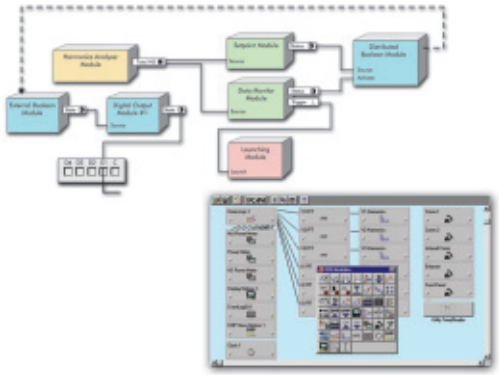
PowerLogic ION Enterprise software allows continuous, wide-area monitoring and data capture for power quality and reliability conditions. IEC 61000-4-30 and EN50160 compliance reporting verifies power quality performance to international standards and allows you to quickly review power quality indices as numeric charts or graphic profiles (requires PowerLogic ION7650 meters or other devices that support compliance monitoring). Display harmonic histograms, odd/even harmonics, THD, K-factor, crest factor, phasor diagrams, and symmetrical components. Plot waveforms of up to many seconds in duration, with overlays that correlate phase-to-phase relationships between voltages, currents, and cascading failures. Plot sags, swells, short duration transients and other disturbance events on industry-standard voltage tolerance curves, including ITIC (CBEMA) and SEMI. For any event, you can display a list of associated time-stamped incidents, then click on any incident to see more detailed information. PowerLogic ION Enterprise supports a wide range of applications:

- Diagnosis and isolation of the cause of power quality-related equipment or process problems
- Proactive assessment of current power quality conditions and trends
- Identification of equipment vulnerabilities and verify reliable operation of power distribution and mitigation equipment
- Benchmarking of power quality performance and comparison of service areas, facilities, or processes
- Setting of a performance baseline and verification of the results of system changes or equipment upgrades

Patented ION® technology

PowerLogic ION Enterprise software and a variety of PowerLogic ION metering products feature the unique ION architecture. The modular, flexible architecture offers extensive customisation of functionality using a simple “building block” approach. The technology uniquely addresses advanced monitoring and control applications and adapts to changing needs, avoiding obsolescence.

PE86105



Use drag-and-drop icons to quickly create customised ION metering, logging, or control functionality within your software or hardware.

Part numbers

New systems and add-ons	**IONE56-BASE**	PowerLogic ION Enterprise base software
	IONE56-DL(1)	PowerLogic ION Enterprise device licence(1)
	IONE56-CL(2)	PowerLogic ION Enterprise client licence
Options	**IONE-SQL-2005**	Integrated SQL Server 2005 Option – Server Licence for 1 CPU
	IONE-SQL-2005-CPU	Additional CPU License for Integrated SQL Server 2005
	IONE-OPC-V1	OPC server version 1.0
	IONE-PQDIF-V1	PQDIF Exporter version 1.0
Upgrades from PowerLogic ION Enterprise 5.0	**IONE56-UPGRADE**	PowerLogic ION Enterprise base upgrade
	IONE56-DLUPG	PowerLogic ION Enterprise device upgrade
	IONE56-CLUPG	PowerLogic ION Enterprise client licence upgrade
PowerLogic ION Enterprise documentation	**CD-TECHDOC**	Compact disc containing the latest version of technical documentation

(1) *A device licence (IONE56-DL) is required for each meter or device connected to your PowerLogic ION Enterprise system. Device licences have a minimum order quantity of five (5).*
(2) *A client licence is required for each workstation that is used to connect to your primary PowerLogic ION Enterprise server.*

ION Enterprise®
Functions and characteristics (cont.)

Features	Standard	Optional
Automated data acquisition from sites/devices	■	-
SQL 2005 Express Edition database	■	-
SQL 2005 Standard Edition database	-	■
Web-enabled real-time monitoring	■	-
Reporting	■	-
Trend analysis	■	-
Power quality analysis, compliance reporting	■	-
Alarms and events	■	-
Manual and automated control	■	-
OPC DA client	■	-
OPC DA server	-	■
PQDIF data export	-	■

Minimum system requirements
Please consult your local Schneider Electric representative for complete system requirements and commissioning information for PowerLogic ION Enterprise. The following are minimum requirements to support 1 to 25 meters with factory default settings.
■ *Server hardware:* CPU requirements are dependent on number of devices and clients to be supported; minimum is 2 GHz CPU, 1 GB RAM, 40 GB disk drive, CDROM drive and Ethernet port.
■ *Server software:* 32-bit only; for applications with a single primary server and single client, server can run Windows XP SP2 Professional; Windows Server 2003; Windows Vista SP1 Business, Enterprise or Ultimate edition, both limited to standalone, 25 devices, MSDE or Express.
■ *Client software requirements:* 32-bit Windows XP Professional or Windows Server 2003, Microsoft Excel 2003, Microsoft Excel 2007.
■ *Modem support:* For dial-up connections, supports any modem compatible with the WinModem standard.

Supported devices

PowerLogic power and energy meters:
■ ION8800
■ ION8600
■ ION7650/7550 series
■ PM800 series
■ ION7300 series
■ PM710, PM750
■ ION6200
■ PM210

PowerLogic circuit monitors:
■ CM3250, CM3350
■ CM4000, CM4250, CM4000T

PowerLogic branch circuit power meters:
■ BCPM

Circuit breaker control units
■ MicroLogic A, P and H devices
■ Micrologic Compact NSX Type A and Type E

Power Measurement power and energy meters:
■ ION8500/8400/8300
■ ION7700
■ ION7600/7500 series
■ ACM3720
■ ACM3710
■ ACM3300

Other
■ Modbus-compatible devices
■ Other devices through OPC

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