Electrical network management

PowerLogic System

Energy management, revenue metering and power quality monitoring

Catalogue
2013

Schneider Electric

PowerLogic System is…

PowerLogic technology forms one part of your total energy management solution from Schneider Electric. As the global energy management specialist, we offer end-to-end power, building and process management solutions that help you optimise energy use and costs, improve performance, enhance comfort and safety, and deliver uninterrupted service while taking responsible care of our planet.

Our expert services can help you audit your energy use and build your energy action plan. From power factor correction systems, harmonic filtering and variable speed drives to HVAC and lighting controls, we offer a complete range of energy efficient technologies.

Schneider Electric believes every business can increase productivity while consuming less and achieving energy savings of 10% to 30%.

Saving energy reduces costs and pollution, but you need the tools to uncover all opportunities, avoid risks, track progress against goals, and verify success. Schneider Electric provides these tools via the world's most advanced energy intelligence technology: PowerLogic.

The PowerLogic range of meters and software help manage all energy assets, every second of the day. A PowerLogic system enables all stakeholders, from CEO to facility and engineering managers, to respond quickly to potential problems and manage energy in financial and environmental terms.

PowerLogic technology delivers the key performance indicators and analytics that you need to strategically balance emissions, efficiency, reliability and cost.

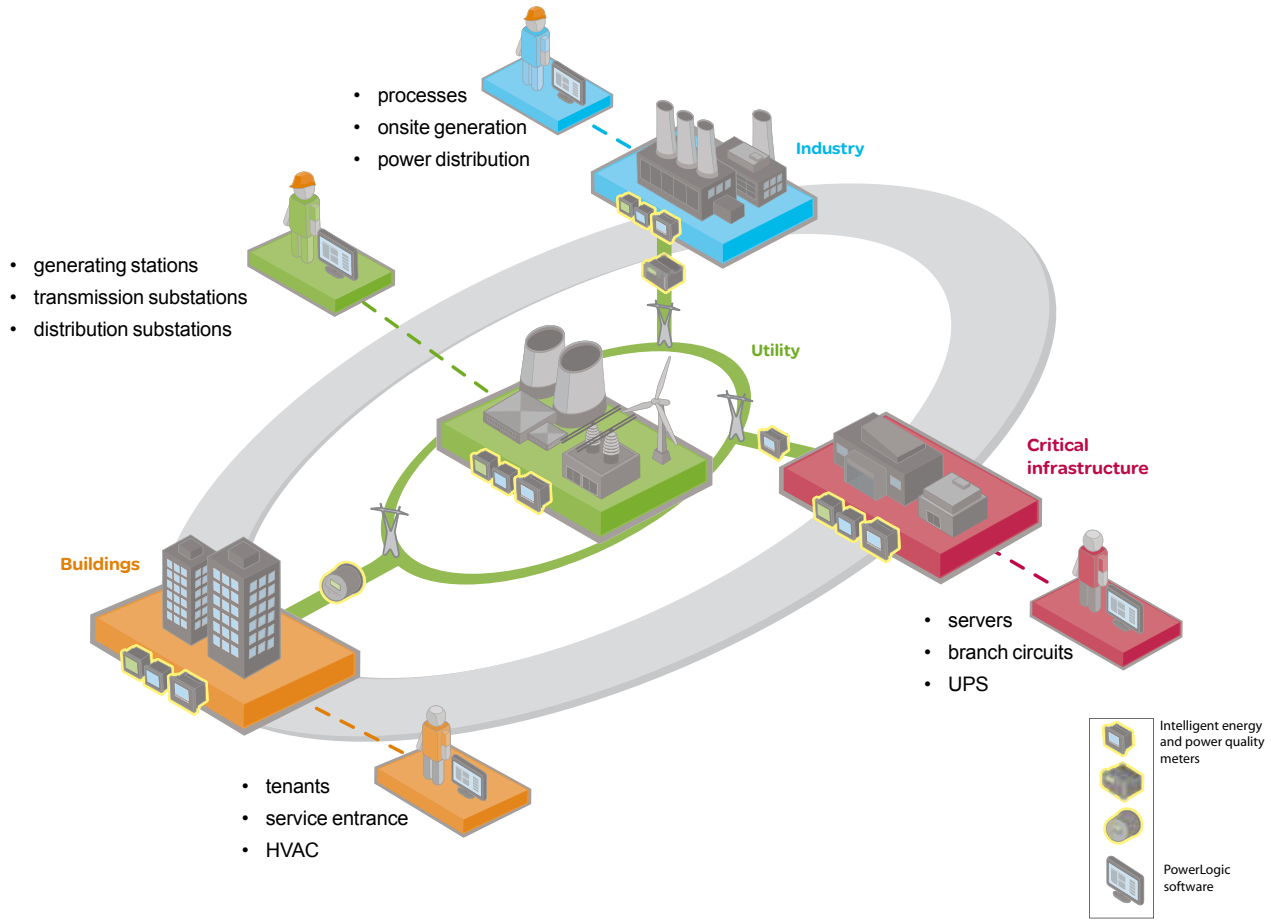
General contents

Gain energy insight and control with PowerLogic™

PowerLogic energy and power management systems

Energy insight = energy control

PowerLogic solutions help energy consumers and suppliers world-wide make the most of their energy. They enable businesses to improve their competitiveness by giving them a complete understanding their organisation's unique energy landscape. PowerLogic technology also provides hands-on tools to improve energy efficiency, reduce operating costs, enhance productivity, and increase power system reliability. Comprising metering, communication hardware and advanced analysis software, a PowerLogic solution acts like a layer of intelligence across all of your energy assets. It monitors key energy points and inputs 24 hours a day, then processes and delivers that data as timely and relevant information to everyone that needs it.



The PowerLogic advantage

PowerLogic solutions are the world's largest and most advanced range of energy management products. Thousands of organisations world-wide choose PowerLogic systems because of key advantages:

- A fast, quantifiable return on investment through both a low total cost of ownership and rich functionality that returns multiple financial benefits
- A comprehensive portfolio of modular, scalable components that enable affordable system expansion as needs dictate and budgets allow
- End-to-end interoperability offering seamless integration with business, accounting, BAS and SCADA applications
- A complete range of compatible, complementary, single-sourced Schneider Electric power and automation solutions
- Support for numerous global metering accuracy and power quality monitoring standards.

Gain energy insight and control with PowerLogic™ (cont.)

Cutting-edge technology to increase profitability

PowerLogic technology converts the complex dynamics governing the relationship between power generation and distribution on the utility side, and energy consumption, cost and reliability on the consumer side, into timely, easily understood information. Businesses can use this powerful to improve tactical actions and strategic decision making.

From a single facility to an entire enterprise, PowerLogic meters monitor key distribution points 24 hours a day. Whether from generators, substations, service entrances, mains, feeders, loads or 3rd party equipment and systems, PowerLogic technology tracks, records and reports all real-time conditions and historical performance data. Intuative web-based interfaces give stakeholders access to this data as well as advanced analytics, alarm annunciation and control capabilities. It supports comprehensive energy management programs by tracking performance and empowering you to make effective decisions.

Applications

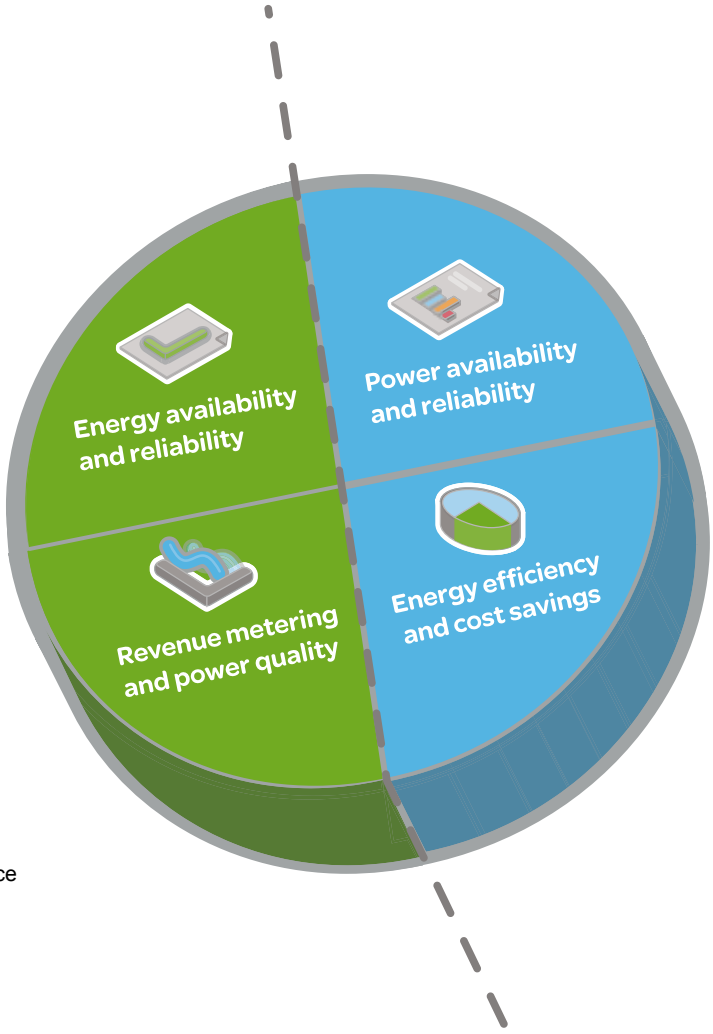
SUPPLY

Energy availability and reliability

- Improve T&D network reliability
- Enhance substation automation
- Maximise the use of your existing infrastructure

Revenue metering and power quality

- Maximise metering accuracy at all interchange points
- Verify compliance with new power quality standards
- Analyse and isolate the source of power quality problems



DEMAND

Power availability and reliability

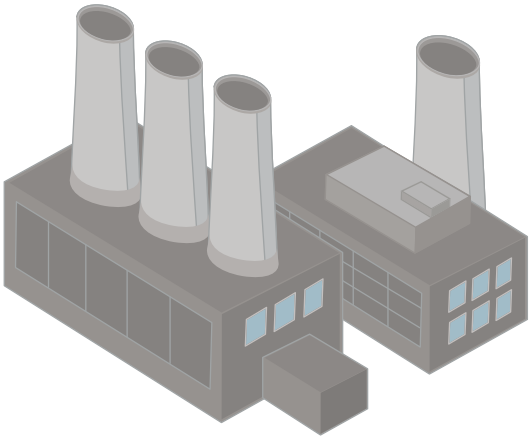
- Validate that power quality complies with the energy contract
- Verify the reliable operation of power and mitigation equipment
- Improve response to power-related problems
- Leverage existing infrastructure capacity and avoid over-building
- Support proactive maintenance to prolong asset life

Energy efficiency and cost savings

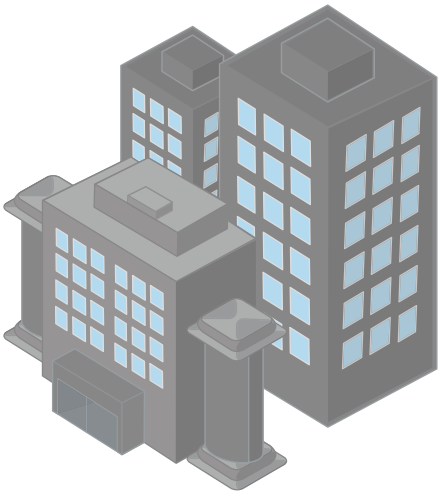
- Measure efficiency, reveal opportunities and verify savings
- Manage green house gas emissions
- Allocate energy costs to departments or processes
- Reduce peak demand and power factor penalties
- Enable participation in load curtailment programs (e.g. demand response)
- Strengthen rate negotiation with energy suppliers
- Identify billing discrepancies
- Sub-bill tenants for energy costs

Industry

From finance to engineering, PowerLogic technology gives industry professionals the energy intelligence and control they need to support strategic decisions and establish best energy practices. It will help you reduce operational costs and meet new emissions standards without compromising production schedules or product quality. Key points are monitored throughout your power distribution, building and backup systems. Enterprise-level software helps you maximise the use of your existing energy assets, increase energy efficiency and avoid demand or power factor penalties. Use it to uncover hidden power problems that can shorten equipment life or cause costly downtime.



- cost allocation
- procurement optimisation
- power factor correction
- measurement and verification
- infrastructure optimisation
- power quality analysis



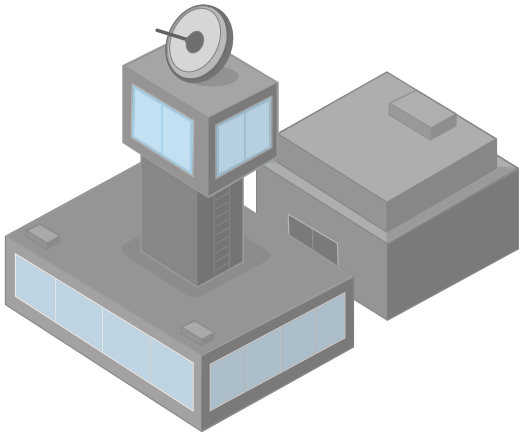
Buildings

Building managers through operations staff can cut energy and maintenance costs without effecting the comfort or productivity of their tenants, employees, students, patients or customers. A PowerLogic system will track all utilities and equipment conditions, and enterprise-level software will help you analyse and improve electrical reliability. You can forecast energy requirements, optimise multi-site contracts and accurately allocate or sub-bill costs. Key performance indicators help you find and sustain energy savings, reduce emissions and meet “green” building standards in order to increase asset value and attract or retain tenants.

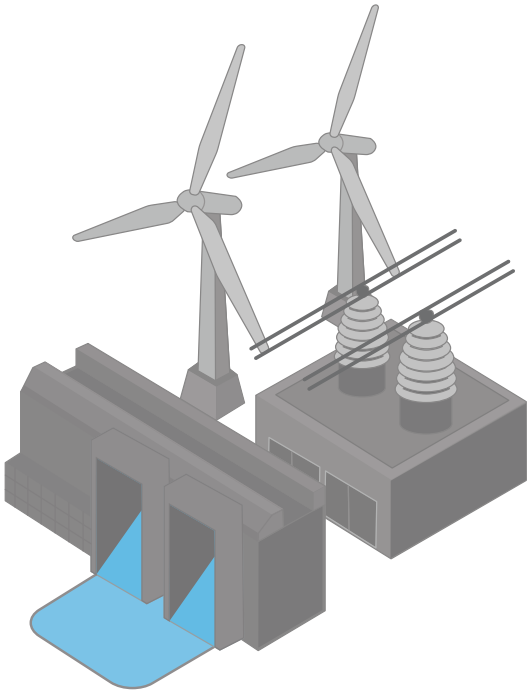
- tenant sub-billing
- cost allocation
- energy efficiency / benchmarking
- procurement optimisation
- power availability
- demand response / load curtailment

Critical infrastructure

PowerLogic technology helps keep your systems operating continuously and securely with an economical supply of energy. Whether you manage data, communication, transportation or environmental services, minimising the risk of power-related downtime and keeping costs under control is a priority. A PowerLogic solution monitors all power and cooling systems and accurately tracks their energy consumption. Enterprise-level software delivers insightful diagnostics and metrics to help verify the reliability of your backup systems and maximise the use of existing capacity to defer new capital investments. You can also reveal energy inefficiencies and strengthen energy procurement across multiple sites.



- infrastructure optimisation
- power quality analysis compliance
- alarming and event notification
- energy efficiency
- cost allocation
- procurement optimisation



- revenue metering
- power availability and reliability

Utilities

Today's energy market is more complex than ever before. Whether you generate, transmit or distribute electricity, more stakeholders need shared access to timely, accurate energy data from more exchange points and you need to maintain power availability and reduce price volatility in the face of rising demand and transmission congestion. A PowerLogic energy information system helps you meet all of these challenges by:

- Metering all key interchange points with the highest possible accuracy
- Improving the quality of power delivered to your customers
- Essuring the reliability and efficiency of your network and equipment.

From advanced energy and power quality metering systems to enterprise-level analytic software, PowerLogic solutions deliver business-critical information that conventional metering, SCADA and billing systems cannot. It gives you the energy intelligence and control needed to track performance, stay informed of critical conditions and empower you to make strategic decisions. It will help you increase reliability, maximise the use of resources and improve service.

Panorama of the PowerLogic range

Current transformers

CT
current transformer

Installation

- insulated cable, diameter 21 to 35 mm, through transformer
- busbar through transformer
- cable connections

Characteristics

- transformation ratio: 40/5 A to 6000/5 A
- accuracy: class 0.5 to 3
- maximum rated operational voltage: 720 V AC
- tropicalised

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Basic panel meters

Name	iAMP / iVLT		AMP / VLT
Function	ammeter, voltmeter		

Applications

Panel instrumentation			
Panel instrumentation	I / U		I / U
Energy efficiency and cost			
Sub billing and cost allocation			
Demand and load management			
Billing analysis			
Power availability and reliability			
Compliance monitoring			
Sag/swell, transient			
Harmonics			
Revenue metering			
Revenue meter			

Characteristics

Measurement accuracy	class 1.5	± 0.5 % ± 1 digit	class 1.5
Installation	DIN rail 4 x 18 mm modules	DIN rail 2 x 18 mm modules	flush mounted 72 x 72 mm 96 x 96 mm
Voltage measurement	VLT: 500 V AC direct or external VT	VLT: 600 V AC direct or external VT	VLT: 500 V AC direct or external VT
Current measurement	AMP: 30 A direct or external CT	AMP: 10 A direct or external CT	AMP: external CT
Communication ports			
Inputs / Outputs			
Memory capacity			

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Panorama of the PowerLogic range (cont.)

Basic energy meters





	iFRE	iCH / iCI	iEM2000 Series	iME1	iEM3000 Series
	frequency meter	hour counter pulse counter	kilowatt-hour meters		
	F	**hours /pulses**	**E**		
	± 0.5 % ± 1 digit		class 1		
	DIN rail 2 x 18 mm modules	CI, CH: DIN rail 2 x 18 mm modules CH: flush mount	DIN rail 1.2 or 4 x 18 mm modules		
	400 V AC direct		400 V AC direct		
			40 to 63 A direct or external CT		
	page 22	**page 27**	**page 31**	**page 31**	**page 34**

Panorama of the PowerLogic range (cont.)

	Multi-circuit metering		*Basic multi-function metering*		
					
Name	**BCPM**	**EM4800**	**ION6200**	**PM3000 Series**	**PM5100/PM5300/ PM5500**
Function	branch circuit monitor IEC 61036 Class 1	multi-circuit energy meter Class 0.5 ANSI C12.1, C12.20 Class 0.5S IEC 62053-22	metering & sub-metering Class 0.5S IEC 60687	metering & sub-metering Class 0.5S IEC 62053-22 Class 1 IEC 62053-21 Class 2IEC 62053-23	metering & sub-metering Class 0.5S IEC 62053-22 Class 0.2S (PM55xx) IEC 62053-22 Class 1/2 IEC 62053-24
Applications					
Panel instrumentation					
Panel instrumentation	**I, U, F, P, Q, S, PF, E (Power demand and current demand)**	**I, U, F, P, Q, S, PF, E (Power demand and current demand)**	**I, U, F, P, Q, S, PF, E (Power demand and current demand)**	**I, U, F, P, Q, S, PF, E (Power demand and current demand)**	**I, U, F, P, Q, S, PF, E (Power demand and current demand)**
Energy efficiency and cost					
Sub billing and cost allocation	■	■	■	■	■
Demand and load management					
Billing analysis					
Power availability & reliability					
Harmonics			■		■
Dip/swell, transient					
Compliance monitoring					
Revenue metering					
Revenue metering					
Characteristics					
Measurement accuracy (active energy)	class 1 (mains active energy)	Class 0.5S	Class 0.5	Class 0.5	Class 0.2S (PM55xx) Class 0.5S
Installation	Installed in panel or enclosure	Installed in panel or enclosure	Flush mount 106.7 mm x 106.7 mm	DIN rail	Flush mount 96 mm x 96 mm
Voltage measurement	90 – 277 V Line to Neutral voltage Inputs	80 - 480 V AC L-L without PTs, Up to 999 kV with external PTs	60 - 400 V AC L-N	50V to 330V AC (Ph-N) 80V to 570V AC (Ph-Ph) up to 1MV AC (ext VT)	20 V L-N / 35 V L-L to 277 V L-N /480 V L-L /600 V L-L (PM55xx)
Current measurement	CT strips for branch circuits and external CTs for mains	Split- or solid-core CTs	external CT	external CT	external CT
Communication ports	1 for main	2	1	1	2
Inputs / Outputs		2	2		4 I/O 6 I/O (PM55xx)
Memory capacity					256 kb 1.1 MB (PM55xx)
	page 42	**page 50**	**page 53**	**page 60**	**page 71**

Panorama of the PowerLogic range (cont.)

Intermediate metering					*Advanced metering*			*Advanced utility metering*					
													
PM810	**PM820/ PM850**	**PM870**	**ION7330/7350**		**ION7550**	**ION7650**	**CM4000T**	**ION8650**			**ION8800**		
								A	**B**	**C**	**A**	**B**	**C**
energy and basic PQ power meter IEC 61557-12 PMD/SD/K70/0.5 PMD/SS/K70/0.5 ANSI 12.20 Class 0.2S real energy			energy and basic PQ power meter IEC 61557-12 PMD/SD/K70/0.5 PMD/SS/K70/0.5 ANSI 12.20 Class 0.2S real energy		energy and power quality meter IEC 62052-11 IEC 62053-22/23 Class 0.2S IEC 61000-4-30 Class A		energy and power quality meter IEC 62053-22 ANSI 12.20 Class 0.2S real energy	energy and power quality meter IEC 62052-11 IEC 62053-22/23 Class 0.2S IEC 61000-4-30 Class A			energy and power quality meter IEC 62052-11 IEC 62053-22/23 Class 0.2S IEC 61000-4-30		
I, U, F, P, Q, S, PF, E, THD, Min/Max, harm, alarm, I/O (I, U unbalance, demand, clock/cal (PM810 w/ PM810LOG))			**I, U, F, P, Q, S, PF, E, THD, harm, alarm, I/O (Power demand and current demand)**		**I, U, F, P, Q, S, PF, E (demand, minimum and maximum values)**			**I, U, F, P, Q, S, PF, E (demand, minimum and maximum values)**					
w/PM810LOG													
		dip/swell											
	PM850 only												
ANSI 62053-22 Class 0.5S ANSI 12.20 Class 0.2S			Class 0.5S		Class 0.2S		Class 0.2S	Class 0.2S			Class 0.2S		
Flush & DIN rail mount 96 mm x 96 mm			Flush & DIN rail mount 96 mm x 96 mm TRAN 60 x 100 x 164.5 mm		DIN 192 standard cutout (186 x 186 mm)			ANSI socket mount 9S, 35S, 36S, 39S and 76S; FT21 switchboard case			DIN 43862 rack		
600 V AC L-L / 347 V AC L-N			50-347 VAC L-N 3P (87-600 L-L) 50-300 VAC L-N 1P (100-600 L-L)		57-347V L-N AC or 100-600V L-L AC		0 to 600 V AC 0 to 1200 kV AC (ext. VT)	57-277V L-N AC (9S, 36S); 120-480 V L-L AC (35S)			57-288V L-N AC or 99-500V L-L AC		
external CT	external CT	external CT	external CT	external CT	external CT		external CT	external CT			external CT		
3	3	3	3	3	5		3	5			5		
18 I/O	18 I/O	18 I/O	8 I/O	8 I/O	up to 32 I/O		up to 25 I/O	up to 22 I/O			up to 16 I/O		
80 kbytes with PM810 LOG	80 / 800 kbytes	800 kbytes	300 kbytes	300 kbytes	up to 10 MB		up to 32 MB	10 MB	4 MB	2 MB	up to 10 MB		
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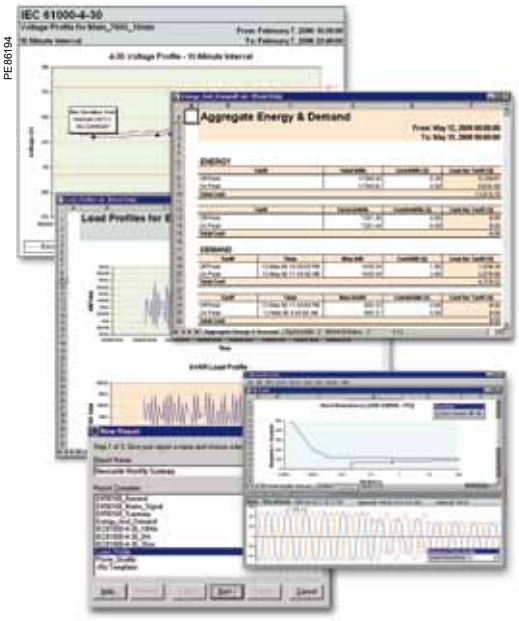
Panorama of the PowerLogic range (cont.)

	Communications				*Monitoring Software*	
						
Name	**Com'X 200**	**EGX100**	**EGX300**	**ION7550 RTU**	**StruxureWare Power Monitoring Expert**	**StruxureWare PowerSCADA Expert**
Function	Ethernet GPRS data logger	Ethernet gateway	Integrated gateway-server	Ethernet gateway-server + onboard I/O	Power management	Network protection and control
Features						
RS485 / Ethernet gateway		■	■	■		
Devices supported	EM3000 Series, iEM3000 Series, PM800 Series, ION6200, ION7300, Acti 9 Smartlink Masterpact, PM5000 Series, Compact NSX, iEM1, iEM2000, iEM3000, PM3000 Series	PM800 Series, CM4000 Series, Sepam Series	Acti 9 Smartlink, BCPM Series, CM Series PM800 Series, CM4000 Series, DM6000, DM6300, iEM3000 Series, ION6200, ION8600, ION8800, ION7550/7650, PM1000, PM200, PM300, PM5350, PM700, PM800,Sepam Series, Compact NSX, Vigilohm IM20/ IM20-H	ION8800, ION7550/7650, ION6200, Modbus devices	ION8800, ION8650, ION7550/7650, ION7550RTU, ION6200, PM800 Series, EM1200, EM5600, CM4000 Series, BCPM, Sepam Series, Compact NSX, Vigilohm IM20, Modicon Mementum M1 - TR8, Twido Modular PLC	Sepam Series 40 PM800 Series BCPM/BCM42 CM4000 Series
Web server with standard HTML pages	(Configuration only)	(Configuration only)	■	■	■	■
Web server with custom HTML pages			■		■	■
Real time data			■	■	■	■
Historical data	Export to Internet database server		■		■	■
Automatic notification				■	■	■
Alarm and event logs					■	■
Waveform display					■	■
Custom animated graphics					■	■
Manual/automatic reports	■				■	■
Characteristics						
Ethernet ports Modbus TCP/IP protocol	2	10/100 Base TX port	10/100 Base TX port	10/100 Base TX port		
RS485 (2-wire / 4-wire) ports Modbus protocol	1	1	1	1		
Number of devices connected directly	32 modbus devices 6 pulse meters (or dry contacts) – 2	32	64	64		
RS232 configuration ports		1	1	1		
Miscellaneous	Connectivity: WiFi, GPRS,or Ethernet	Serial line to Ethernet connectivity	Entry-level Energy Management in a box	modem port I/O (24 I/30 O max)		
Installation	DIN rail	DIN rail	DIN rail	DIN 192 cutout (186 x 186 mm)		
	page 125	page 127		page 129	page 139	page 145

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.



PE86194

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

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.

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.

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.

Index of catalogue numbers

Index of catalogue numbers (cont.)

Index of catalogue numbers

CT current transformers

16453.

16462.

16542.

16453 + 16550.

Sealable cover.

Function

The Ip/5A ratio current transformers deliver at the secondary a current of 0 to 5 A that is proportional to the current measured at the primary. They are available in two major families:

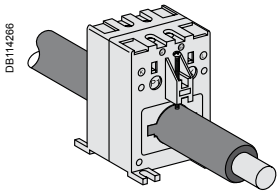
- cable current transformers
- bar current transformers.

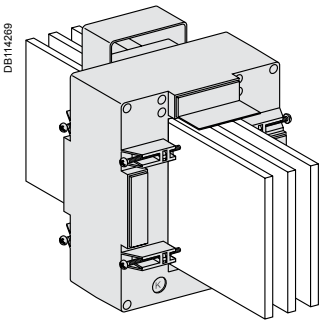
This allows them to be used in combination with measurement instruments: ammeters, kilowatt-hour meters, measurement units, control relays, etc.

Common technical data

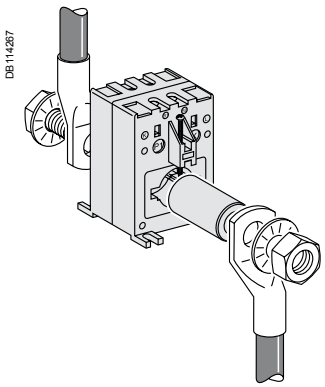
- Secondary current: 5 A
- Max. voltage rating Ue: 720 V
- Frequency: 50/60 Hz
- Safety factor (sf):
  - 40 to 4000 A: sf ⩽ 5
  - 5000 to 6000 A: sf ⩽ 10.
- Degree of protection: IP20
- Operating temperature: tropicalised range, -25°C to +60°C, relative humidity > 95 %
- Compliance with standards: IEC 60044-1 and VDE 0414
- Secondary connection (as per model):
  - by terminals for lug
  - by tunnel terminals
  - by screws.

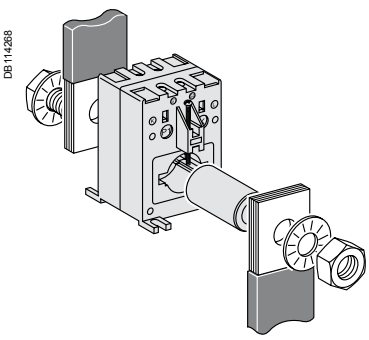
Connection





CT with let-through primary.





CT with primary connection by screw and nut.
Use of cylinder 16550 or 16551.

The three references 16482, 16483 and 16534 have a double connection output at the secondary: twice S1 and twice S2. The terminals are in parallel, as there is only one secondary winding.
The unused secondary outputs must not be connected.

CT current transformers (cont.)

Catalogue numbers

Rating Ip/5 A	Power (VA) Accuracy class: 0.5	1	3	Insulated cable: maximum diameter (1) (mm)	maximum cross-section (1) (mm^2)	Dimension opening for bars	Weight (g)	Cat. no. Tropicalised CT	Cylinder (2)	Sealable cover
40 A	-	-	1	21	120	-	200	**16500**	**16550** (3)	built-in
50 A	-	1.25	1.5	21	120	-	200	**16451**	**16550**	built-in
75 A	-	1.5	2.5	21	120	-	200	**16452**	**16550**	built-in
100 A	2	2.5	3.5	21	120	-	200	**16453**	**16550**	built-in
125 A	2.5	3.5	4	21	120	-	200	**16454**	**16550**	built-in
150 A	3	4	5	21	120	-	200	**16455**	**16550**	built-in
	1.5	5.5	6.5	22	150	30 x 10	270	**16459**	**16551** (4)	**16552**
200 A	4	5.5	6	21	120	-	200	**16456**	**16550**	built-in
	4	7	8.5	22	150	30 x 10	270	**16460**	**16551**	**16552**
	-	2	5	-	-	65 x 32	600	**16476**	**-**	built-in
250 A	6	9	11	22	150	30 x 10	270	**16461**	**16551**	**16552**
	2.5	5	8	35	240	40 x 10	430	**16468**	**-**	**16553**
	1	4	6	-	-	65 x 32	600	**16477**	**-**	built-in
300 A	7.5	11	13.5	22	150	30 x 10	270	**16462**	**16551**	**16552**
	4	8	12	35	240	40 x 10	430	**16469**	**-**	**16553**
	1.5	6	7	-	-	65 x 32	600	**16478**	-	built-in
400 A	10.5	15	18	22	150	30 x 10	270	**16463**	**16551**	**16552**
	8	12	15	35	240	40 x 10	430	**16470**	**-**	**16553**
	4	8	10	-	-	65 x 32	600	**16479**	-	built-in
500 A	12	18	22	22	150	30 x 10	270	**16464**	**16551**	**16552**
	10	12	15	35	240	40 x 10	430	**16471**	**-**	**16553**
	2	4	6	-	-	64 x 11 51 x 31	500	**16473**	**-**	built-in
	8	10	12	-	-	65 x 32	600	**16480**	-	built-in
600 A	14.5	21.5	26	22	150	30 x 10	270	**16465**	**16551**	**16552**
	4	6	8	-	-	64 x 11 51 x 31	500	**16474**	**-**	built-in
	8	12	15	-	-	65 x 32	600	**16481**	-	built-in
800 A	12	15	20	-	-	65 x 32	600	**16482**	-	built-in
1000 A	15	20	25	-	-	65 x 32	600	**16483**	-	built-in
1250 A	15	20	25	-	-	65 x 32	600	**16534**	-	built-in
	12	15	20	-	-	84 x 34	700	**16537**	**-**	built-in
	8	12	-	-	-	127 x 38	1500	**16540**	**-**	built-in
1500 A	20	25	30	-	-	65 x 32	600	**16535**	**-**	built-in
	15	20	25	-	-	84 x 34	700	**16538**	**-**	built-in
	10	15	-	-	-	127 x 38	1000	**16541**	**-**	built-in
2000 A	15	20	-	-	-	127 x 38	1000	**16542**	**-**	built-in
2500 A	20	25	-	-	-	127 x 38	1000	**16543**	**-**	built-in
	30	50	60	-	-	127 x 52	1300	**16545**	**-**	built-in
3000 A	25	30	-	-	-	127 x 38	1000	**16544**	**-**	built-in
	40	60	60	-	-	127 x 52	1300	**16546**	**-**	built-in
4000 A	50	60	60	-	-	127 x 52	1300	**16547**	**-**	built-in
5000 A	60	120	-	-	-	165 x 55	5000	**16548**	**-**	built-in
6000 A	70	120	-	-	-	165 x 55	5000	**16549**	**-**	built-in

(1) *Cable(s) that can be routed through the CT*
(2) For CT with primary connection by screw and nut.
(3) Cylinder with inner dia. 8.5 mm, L = 32 mm
(4) Cylinder with inner dia. 12.5 mm, L = 62 mm

Fastening mode

CT cat. no.	Adapter for DIN rail	Mounting plate	Insulated locking screw
16451...16456	■	■	-
16459...16471	■	■	■
16473 and 16474	-	■	■
16476...16483	-	-	■
16500	■	■	-
16534...16549	-	-	■

CT current transformers (cont.)

Choosing a current transformer

Choice of a CT depends on 2 criteria:
- the Ip/5 A ratio
- the installation type.

The Ip/5 A ratio

We recommend that you choose the ratio immediately higher than the maximum measured current (In).
Example: In = 1103 A; ratio chosen = 1250/5.
For small ratings from 40/5 to 75/5 and for an application with digital devices, we recommend that you choose a higher rating, for example 100/5.
This is because small ratings are less accurate and the 40 A measurement, for example, will be more accurate with a 100/5 CT than with a 40/5 CT.

The installation type

Choice of a CT model depends on the installation type:
- insulated cables
- mounting on bars.

Important precaution

Never open the secondary circuit of a current transformer when the primary circuit is energised.
Prior to working on the secondary circuit, the secondary terminals of the current transformer must be short-circuited.

Determining the accuracy class of a CT

The accuracy class depends on the apparent power (VA) of the transformer and on consumption of the complete measurement system.
The latter allows for consumption of all the devices and the connecting cables.
For a given accuracy class, consumption of the measurement system must not exceed apparent power (VA) of the CT transformer.

Copper cable cross-section (mm^2)	Power in VA per doubled meter at 20°C
1	**1**
1.5	**0.685**
2.5	**0.41**
4	**0.254**
6	**0.169**
10	**0.0975**
16	**0.062**

For each temperature variation per 10°C bracket, the power drawn up by the cables increases by 4 %.

Schneider Electric device	Consumption of the current input in VA
Ammeter 72 x 72 / 96 x 96	**1.1**
Analogue ammeter	**1.1**
Digital ammeter	**0.3**
PM800, CM4000	**0.15**

Example: consumption of a measurement system at 20°C

PM800		0.15 VA
4 meters of 2.5 mm^2 doubled wires	+	1.64 VA
i.e. a measurement system consumption	=	**1.79 VA**

Based on the result, the CT accuracy class is determined (see previous page):
- class 3 for a 75/5 ratio CT
- class 0.5 for a 100/5 ratio CT

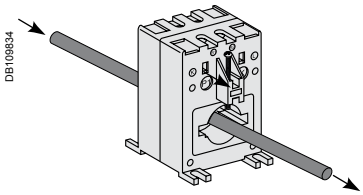
CT current transformers (cont.)

Specific case of the motor starter

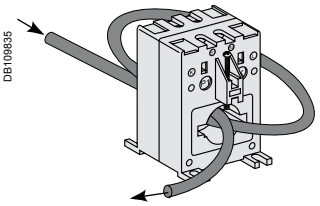
To measure motor starter current, you must choose a CT with primary current Ip = Id/2 (Id = motor starting current).

Practical advice

Use a current transformer to measure a nominal current of 50 A.



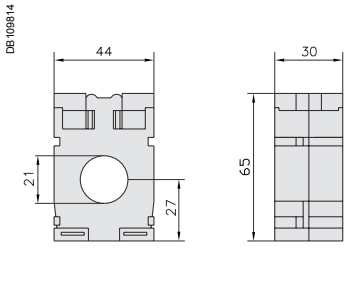
50/5 A CT: Imax = 50 A



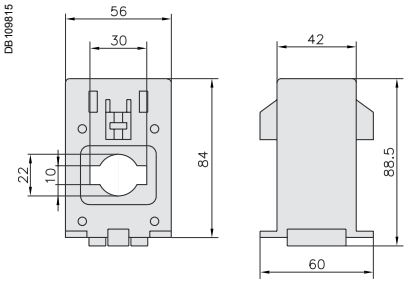
100/5 A CT, 2 cable openings: Imax = 50 A

To divide by 2 the nominal current of a transformer, you only need to pass the current to be measured twice through this transformer.

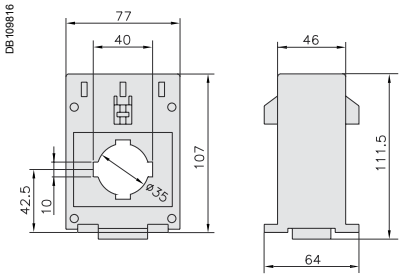
Dimensions



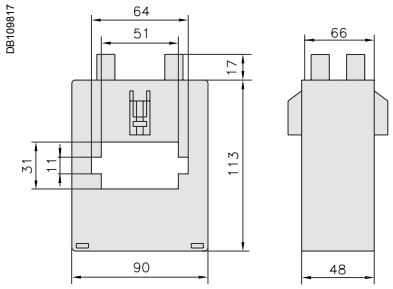
Cat. no. 16500, 16451 to 16456



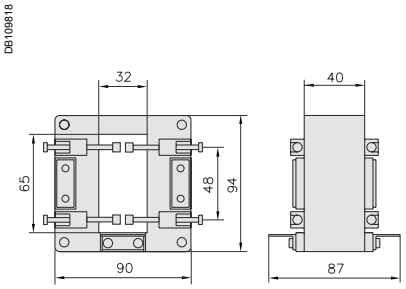
Cat. no. 16459 to 16465



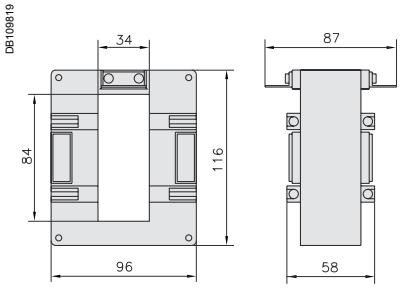
Cat. no. 16468 to 16471



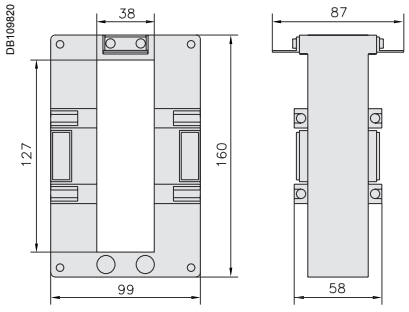
Cat. no. 16473 and 16474



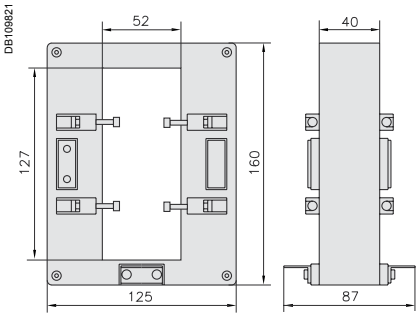
Cat. no. 16534 to 16535, 16476 to 16483



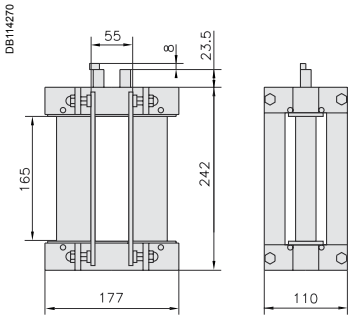
Cat. no. 16537 and 16538



Cat. no. 16540 to 16544

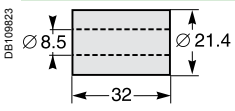


Cat. no. 16545 to 16547



Cat. no. 16548 and 16549

Cylinders



Cat. no. 16550

Cat. no. 16551

DIN rail analogue ammeters and voltmeters

DB119006

iAMP.

DB119005

iVLT.

Function

iAMP

Ammeters measure the current flowing through an electric circuit in amps.

iVLT

Voltmeters measure the potential (voltage) difference of an electric circuit in volts.

Common technical data

Accuracy: class 1.5.

- ■ Complies with standards IEC 60051-1, IEC 61010-1 and IEC 61000-4.
- ■ Ferromagnetic device.
- ■ Pseudo-linear scale over 90°.
- ■ Ammeters (except catalogue number 16029):
  - □ connection on CT, ratio In/5, to be ordered separately
  - □ interchangeable dials.
- ■ Temperature:
  - □ operating temperature: -25°C to +55°C.
  - □ reference temperature: 23°C.
- ■ Influence of temperature on accuracy: ±0.03 % /°C.
- ■ Utilisation frequency: 50/60 Hz.
- ■ Consumption:
  - □ AMP: 1.1 VA
  - □ VLT catalogue number 15060: 2.5 VA
  - □ VLT catalogue number 16061: 3.5 VA.
- ■ Permanent overload:
  - □ AMP: 1.2 In
  - □ VLT: 1.2 Un.
- ■ Maximum overload for 5 s:
  - □ AMP: 10 In
  - □ VLT: 2 Un.
- ■ Connection: tunnel terminals for 1.5 to 6 mm^2 rigid cables.

Catalogue numbers

Type	Scale	Connection with CT	Width in mod. of 9 mm	Cat. no.
iAMP with direct connection				
	0-30 A	no	8	**16029**
iAMP with connection on CT				
Basic device (delivered without dial)		X/5	8	**16030**
Dial	0-5 A			**16031**
	0-50 A	50/5		**16032**
	0-75 A	75/5		**16033**
	0-100 A	100/5		**16034**
	0-150 A	150/5		**16035**
	0-200 A	200/5		**16036**
	0-250 A	250/5		**16037**
	0-300 A	300/5		**16038**
	0-400 A	400/5		**16039**
	0-500 A	500/5		**16040**
	0-600 A	600/5		**16041**
	0-800 A	800/5		**16042**
	0-1000 A	1000/5		**16043**
	0-1500 A	1500/5		**16044**
	0-2000 A	2000/5		**16045**
iVLT				
	0-300 V		8	**16060**
	0-500 V		8	**16061**

DIN rail digital ammeters, voltmeter and frequency meter

iAMP.

iVLT.

iFRE.

Function

iAMP
Ammeters measure in amps the current flowing through an electric circuit.

iVLT
Voltmeters measure in volts the potential (voltage) difference of an electric circuit.

iFRE
The frequency meter measures in hertz the frequency of an electric circuit from 20 to 600 V AC.

Common technical data

Supply voltage: 230 V.
Operating frequency: 50/60 Hz.
Display by red LED: 3 digits, h = 8 mm.
Accuracy at full-scale: 0.5 % ±1 digit.
Consumption: max. 5 VA or rated 2.5 VA.
Degree of protection:
- IP40 on front face
- IP20 at terminal level.

Connection: tunnel terminals for 2.5 mm^2 cables.

Specific data

10 A direct reading ammeter
Minimum value measured: 4 % of rating.
Measurement input consumption: 1 VA.

Multi-rating ammeter
Ratings:
- in direct reading: 5 A
- by CT (not supplied) configurable on the front face of the ammeter: 10, 15, 20, 25, 40, 50, 60, 100, 150, 200, 250, 400, 500, 600, 800, 1000, 1500, 2000, 2500, 4000, 5000 A.

Minimum value measured: 4 % of rating.
Measurement input consumption: 0.55 VA.

Voltmeter
Direct measurement: 0...600 V.
Input impedance: 2 MΩ.
Minimum value measured: 4 % of rating.

Frequency meter
Minimum value measured: 20 Hz.
Maximum value measured: 100 Hz.
Full-scale display: 99.9 Hz.

Compliance with standards
Safety: IEC/EN 61010-1.
EMC electromagnetic compatibility: IEC/EN 65081-1 and IEC/EN 65082-2.

Catalogue numbers

Type	Scale	Connection with CT	Width in mod. of 9 mm	Cat. no.
Direct reading iAMP				
	0-10 A	No	4	**15202**
Multi-rating iAMP				
	0-5000 A	As per rating	4	**15209**
iVLT				
	0-600 V		4	**15201**
iFRE				
	20-100 Hz		4	**15208**

72 x 72 analogue ammeters and voltmeter

PB101118-30_c

AMP for standard feeder.

PB101119-30_c

AMP for motor feeder.

PB101116-30_c

VLT.

Function

The 72 x 72 measurement devices are designed for flush-mounted installation on doors, wicket doors and front plates of enclosures and cubicles.

AMP

The ammeters measure in amps the current flowing through an electrical circuit.

VLT

The voltmeter measure in volts the potential difference (voltage) of an electrical circuit.

Common technical data

- Accuracy: class 1.5.
- Compliance with standard IEC 60051-1, IEC 61010-1 and IEC 61000-4.
- Ferromagnetic device.
- Scale length: 62 mm over 90°.
- Mounting in enclosure or in cubicle.
- Degree of protection: IP52.
- Maximum operating position: 30° / vertical.
- Temperature:
  - operation: -25°C to +50°C
  - reference: 23°C.
- Influence of temperature on accuracy: ±0.003 % /°C.
- Utilisation frequency: 50/60 Hz.

AMP specific technical data

- Needs a In/5 CT to be ordered separately.
- Interchangeable dials to be ordered separately.
- Consumption: 1.1 VA.
- Permanent overload: 1.2 In.
- Maximum overload for 5 s: 10 In.

VLT specific technical data

- Consumption: 3 VA.
- Permanent overload: 1.2 Un.
- Maximum overload for 5 s: 2 Un.

Catalogue numbers

Type	Scale	Connection on CT	Cat. no.
AMP for standard feeder			
Basic device (delivered without dial)		X/5	**16004**
1.3 In dial	0-50 A	50/5	**16009**
	0-100 A	100/5	**16010**
	0-200 A	200/5	**16011**
	0-400 A	400/5	**16012**
	0-600 A	600/5	**16013**
	0-1000 A	1000/5	**16014**
	0-1250 A	1250/5	**16015**
	0-1500 A	1500/5	**16016**
	0-2000 A	2000/5	**16019**
AMP for motor feeder			
Basic device (delivered without dial)		X/5	**16003**
3 In dial	0-30-90 A	30/5	**16006**
	0-75-225 A	75/5	**16007**
	0-200-600 A	200/5	**16008**
VLT			
	0-500 V		**16005**

96 x 96 analogue ammeters and voltmeter

AMP for standard feeder.

AMP for motor feeder.

VLT.

Function

The 96 x 96 measurement devices are designed for flush-mounted installation on doors, wicket doors and front plates of enclosures and cubicles.

AMP

The ammeters measure in amps the current flowing through an electrical circuit.

VLT

The voltmeter measure in volts the potential difference (voltage) of an electrical circuit.

Common technical data

- Accuracy: class 1.5.
- Compliance with standard IEC 60051-1, IEC 61010-1 and IEC 61000-4.
- Ferromagnetic device.
- Scale length: 80 mm over 90°.
- Mounting in enclosure or in cubicle.
- Degree of protection: IP52.
- Maximum operating position: 30° / vertical.
- Temperature:
  - operation: -25°C to +50°C
  - reference: 23°C.
- Influence of temperature on accuracy: ±0.003 % /°C.
- Utilisation frequency: 50/60 Hz.

AMP specific technical data

- Needs a In/5 CT to be ordered separately.
- Interchangeable dials to be ordered separately.
- Consumption: 1.1 VA.
- Permanent overload: 1.2 In.
- Maximum overload for 5 s: 10 In.

VLT specific technical data

- Consumption: 3 VA.
- Permanent overload: 1.2 Un.
- Maximum overload for 5 s: 2 Un.

Catalogue numbers

Type	Scale	Connection on CT	Cat. no.
AMP for standard feeder			
Basic device (delivered without dial)		X/5	**16074**
1.3 In dial	0-50 A	50/5	**16079**
	0-100 A	100/5	**16080**
	0-200 A	200/5	**16081**
	0-400 A	400/5	**16082**
	0-600 A	600/5	**16083**
	0-1000 A	1000/5	**16084**
	0-1250 A	1250/5	**16085**
	0-1500 A	1500/5	**16086**
	0-2000 A	2000/5	**16087**
	0-2500 A	2500/5	**16088**
	0-3000 A	3000/5	**16089**
	0-4000 A	4000/5	**16090**
	0-5000 A	5000/5	**16091**
	0-6000 A	6000/5	**16092**
AMP for motor feeder			
Basic device (delivered without dial)		X/5	**16073**
3 In dial	0-30-90 A	30/5	**16076**
	0-75-225 A	75/5	**16077**
	0-200-600 A	200/5	**16078**
VLT			
	0-500 V		**16075**

48 x 48 CMA and CMV selector switches

CMA.

CMV.

Function

The 48 x 48 selector switches are designed for flush-mounted installation on doors, wicket doors and front plates of enclosures and cubicles.

CMA

The ammeter selector switch uses a single ammeter (by means of current transformers) for successive measurement of the currents of a three-phase circuit.

CMV

The voltmeter selector switch uses a single voltmeter for successive measurement of the voltages (phase-to-phase and phase-to-neutral) of a three-phase circuit.

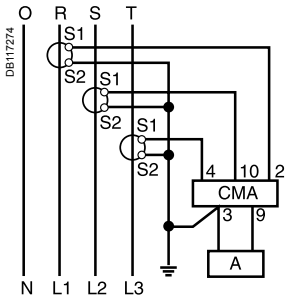
Common technical data

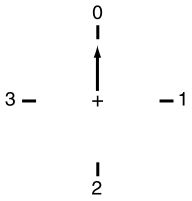
- ■ Durability:
  - □ electrical: 100 000 operations
  - □ mechanical: 2 000 000 operations.
- ■ AgNi contact.
- ■ Operating temperature: -25°C to +50°C.
- ■ Compliance with standards IEC/EN 60947-3.
- ■ Degree of protection:
  - □ IP65 on front face
  - □ IP20 at terminal level.

Catalogue numbers

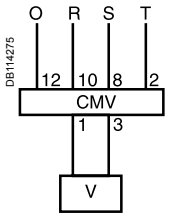
Type	Rating (A)	Voltage (V)	Number of positions	Cat. no.
CMA	20		4	**16017**
CMV		500	7	**16018**

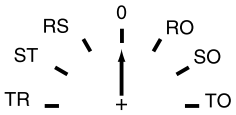
Connection





CMA.





CMV.

Reading 3 phase-to-earth voltages + 3 phase-to-phase voltages.

***Note**: when connecting do not remove the pre-cabling.*

DIN rail iCMA and iCMV selector switches

iCMA.

iCMV.

Function

iCMA

This 4-position ammeter selector switch uses a single ammeter (using current transformers) for successive measurement of the currents of a three-phase circuit.

iCMV

This 7-position voltmeter selector switch uses a single voltmeter for successive measurement of voltages (phase-to-phase and phase-to-neutral) of a three-phase circuit.

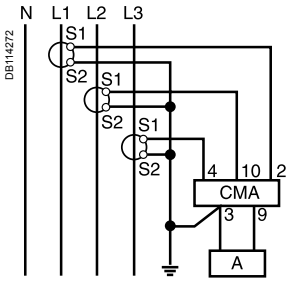
Common technical data

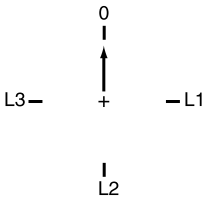
- ■ Rotary handle.
- ■ Maximum operating voltage: 440 V, 50/60 Hz.
- ■ Nominal thermal current: 10 A.
- ■ Operating temperature: -20°C to +55°C.
- ■ Storage temperature: -25°C to +80°C.
- ■ Mechanical durability (AC21A-3 x 440 V): 2 000 000 operations.
- ■ Degree of protection:
- □ IP66 on front face
- □ IP20 at terminal level.
- ■ Electrical durability: 1 000 000 operations.
- ■ Connection: jumper terminals with captive screws, for cables up to 1.5 mm^2.
- ■ Complies with standards: IEC/EN 60947-3.

Catalogue numbers

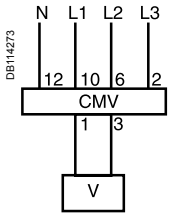
Type	Rating (A)	Voltage (V AC)	Width in mod. of 9 mm	Cat. no.
iCMA	10	415	4	**15126**
iCMV	10	415	4	**15125**

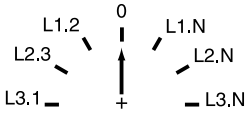
Connection





iCMA.





iCMV.

iCH hour counters

DB119002

iCH "DIN".

DB119003

CH "48 x 48".

Function

Electromechanical counter that counts the operating hours of a machine or piece of electrical equipment. Giving a precise indication of operating time, the counter is used to decide when to carry out preventive maintenance.

Common technical data

- Electromechanical display.
- Maximum display: 99999.99 hours.
- Display accuracy: 0.01 %.
- Without reset.
- Storage temperature: -25°C to +85°C.
- Connection: tunnel terminals for 2.5 mm^2 cable.

Specific technical data

iCH "DIN"

- Consumption: 0.15 VA.
- Operating temperature: -10°C to +70°C.
- Mounting on DIN rail.

CH "48 x 48"

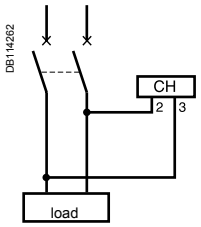
- Consumption:
  - 15607: 0.25 VA
  - 15608: 0.15 VA
  - 15609: 0.02 VA to 12 V and 0.3 VA to 36 V.
- Operating temperature: -20°C to + 70°C.
- Degree of protection: IP65 on front face.
- Mounting on front face of monitoring switchboards.

Catalogue numbers

Type	Voltage (V)	Width in mod. of 9 mm	Cat. no.
iCH "DIN"	230 V AC ± 10 %/50 Hz	4	**15440**
CH "48 x 48"	24 V AC ± 10 %/50 Hz		**15607**
	230 V AC ± 10 %/50 Hz		**15608**
	12 to 36 V DC		**15609**

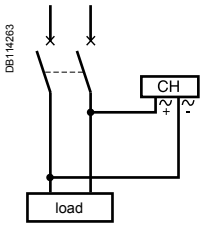
Connection

DB114262



iCH "DIN".

DB114263



CH "48 x 48".

iCI impulse counter

DB119004

Function

Electromechanical counter designed to count impulses emitted by: kilowatt hour meters, temperature overrun detectors, people meters, speed meters, etc.

Common technical data

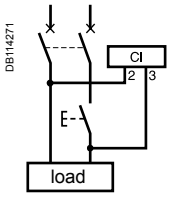
- Supply and metering voltage: 230 V AC ± 10 %, 50/60 Hz.
- Consumption: 0.15 VA.
- Maximum display: 9 999 999 impulses.
- Without reset.
- Metering data:
  - minimum impulse time: 50 ms
  - minimum time between 2 impulses: 50 ms.
- Storage temperature: -25°C to +85°C.
- Operating temperature: -10°C to +70°C.
- Connection: tunnel terminals for 2.5 mm^2 cable.

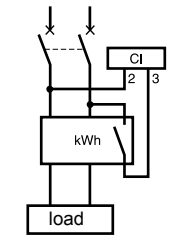
Catalogue number

Type	Width in mod. of 9 mm	Cat. no.
iCI	4	**15443**

Connection

DB114271

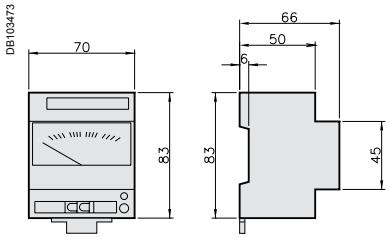




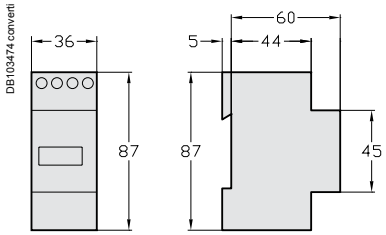
Dimensions

Ammeters, voltmeters, selector switches, impulse counter, hour counters

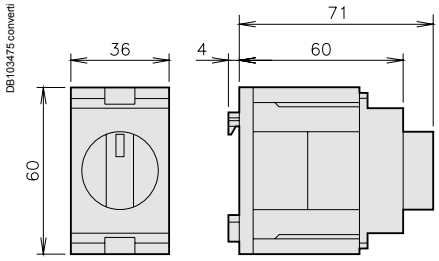
Analogue ammeters and voltmeters



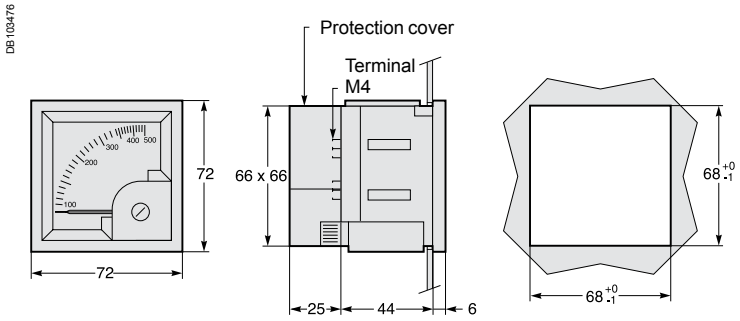
Digital ammeters, voltmeter and frequency meter



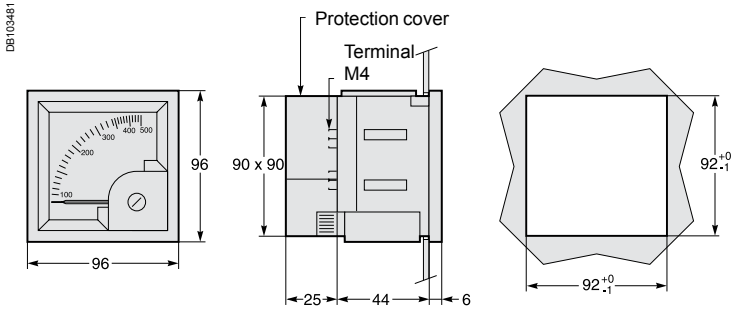
iCMA and iCMV selector switches



72 x 72 analogue ammeters and voltmeter



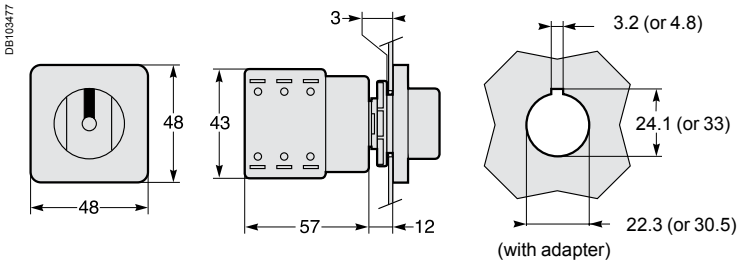
96 x 96 analogue ammeters and voltmeter



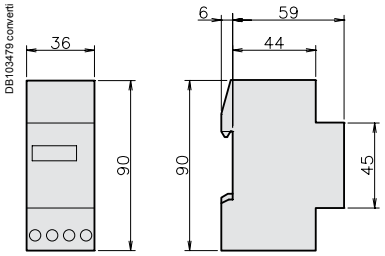
Dimensions (cont.)

Ammeters, voltmeters, selector switches, impulse counter, hour counters

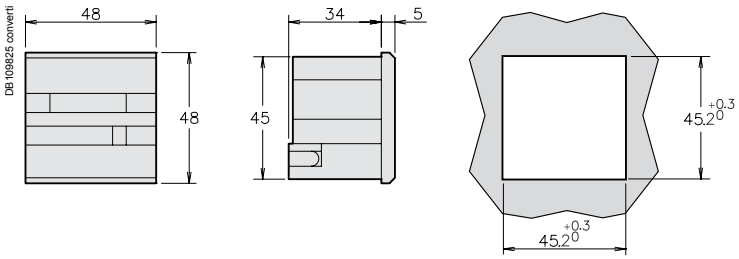
48 x 48 CMA and CMV selector switches



iCI impulse counter and iCH hour counter



48 x 48 CH hour counters



Kilowatt-hour meters

iEM2000T

iEM2000

iEM2010

iME1zr.

Function

Digital kilowatt-hour meters designed for sub-metering of active energy (rms) consumed by a single-phase or three-phase electric circuit with or without distributed neutral.

iEM2000T
40 A single-phase kilowatt-hour meter without display, with remote transfer of metering impulses (static output).

iEM2000
40 A single-phase kilowatt-hour meter.

iEM2010
40 A single-phase kilowatt-hour meter with remote transfer of metering impulses (static output).

iME1
Single-phase kilowatt-hour meter.

iME1z
Single-phase kilowatt-hour meter with partial meter.

iME1zr
Single-phase kilowatt-hour meter with partial meter and remote transfer of metering impulses (relay output).

Catalogue numbers

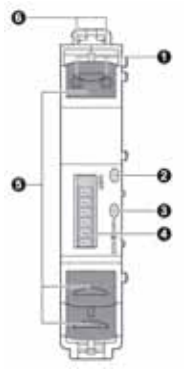
Type	Rating (A)	Voltage (V AC)	Tolerance (V AC)	Width in mod. of 9 mm	Cat. no.
Single-phase circuit (1L + N)					
iEM2000	40	230	±20	2	**A9MEM2000**
iEM2010	40	230	±20	2	**A9MEM2010**
iEM2000T	40	230	±20	2	**A9MEM2000T**
iME1	63	230	±20	4	**A9M17065**
iME1z	63	230	±20	4	**A9M17066**
iME1zr	63	230	±20	4	**A9M17067**

Main technical data

	iEM2000T	iEM2000/iEM2010	iME
Accuracy class	1	1	1
Frequency	48/62 Hz	48/62 Hz	48/62 Hz
Consumption	<10VA	<10VA	2.5 VA
Operating temp	-10°C to +55°C	-10°C to +55°C	-25°C to +55°C
Connection by tunnel terminals	Top terminals: 4 mm^2	Top terminals: 4 mm^2	Top terminals: 6 mm^2
	Bottom terminals: 10 mm^2	Bottom terminals: 10 mm^2	Bottom terminals: 16 mm^2
Compliance with standard	IEC 61557-12 : - PMD/DD/K55/1	IEC 61557-12 : - PMD/DD/K55/1	IEC 61557-12 : - PMD/DD/K55/1
	IEC 62053-21 (accuracy)	IEC 62053-21 (accuracy)	IEC 62053-21 (accuracy)
Sealable screw shield	Yes	Yes	Yes
MID Compliance	No	Yes	No

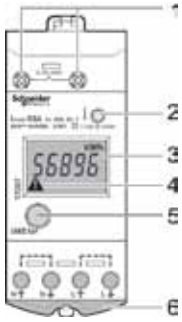
Kilowatt-hour meters (cont.)

DB115816



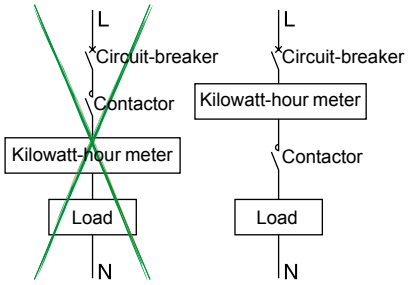
iEM2010

DB118760_i



iME1zr.

DB118815



Example: meter on a load switching

Description

iEM2000, iEM2010, iEM2000T

1 Remote transfer pulse output (iEM2000T, iEM2010).
2 Green power-on indicator light.
3 Yellow metering indicator light (flashing).
4 Display unit (iEM2000, iEM2010).
5 Seal.
6 Allow the comb busbar to pass.

iME1, iME1z, iME1zr

1 Pulse output for remote transfer (iME1zr).
2 Flashing meter indicator.
3 Total or partial meter display (iME1z, iME1zr).
4 Wiring error indicator.
5 Push-button: total or partial meter display, reset partial meter (ME1z, ME1zr).
6 Sealing connection.

Installation

- The front panel of the product is IP40 and its housing is IP20.
- Its installation must be appropriate to the operating conditions.
- The protection must not be less than IP65 for outdoor use.

Use with a contactor

A measurement instrument is normally continually supplied.
For a non-continuous supply (load switching), we recommend that you place the breaking device downstream from the measurement instrument to limit disturbances on the module inputs.
These disturbances, particularly on inductive loads, may result in early ageing of the device.
You must also place the measurement instrument at a distance from the breaking device to limit the risk of disturbance.

Kilowatt-hour meters (cont.)

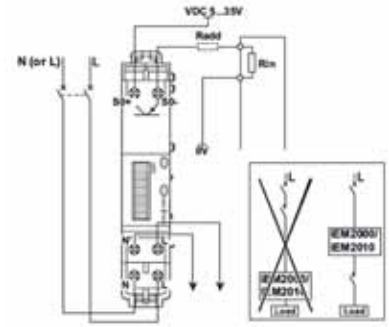
Specific technical data

iEM2000, iEM2010, iEM2000T, iME1, iME1z and iME1zr specific technical data						
	iEM2000	**iEM2010**	**iEM2000T**	**iME1**	**iME1z**	**iME1zr**
Direct measurement	Up to 40 A			Up to 63 A		
Metering and activity indicator light (yellow)	3,200 flashes per kWh			1,000 flashes per kWh		
Wiring error indicator	Yes					
Total meter (max. capacity) on one phase	999 999.9 kWh			999.99 MWh		
Total meter display	In kWh with 7 significant digits (not for iEM2000T)			In kWh or MWh with 5 significant digits. No decimal point in kWh; 2 digits after the decimal point in MWh		
Partial meter (max. capacity) on one phase with RESET	-			-	99.99 MWh	
Partial meter display	-			-	In kWh or MWh with 4 significant digits. No decimal point in kWh; 2 digits after the decimal point in MWh	
Remote transfer	-	By static output: - ELV insulation voltage: 4 kV, 50 Hz - 20 mA/35 V DC max. - 100 impulses of 120 ms per kWh		-	-	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 1 impulse of 200 ms (contact closing) per kWh

Connection

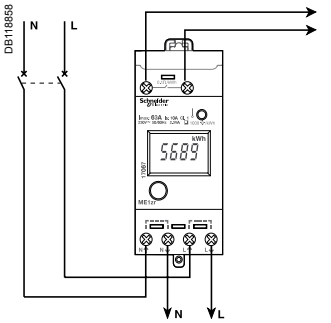
Single-phase circuit

DB118858



iEM2010

DB118858

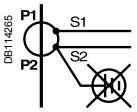


iME1 / iME1z / iME1zr.

Caution

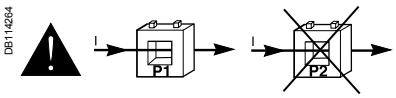
■ Do not earth the CT secondary (S2).

DB114265



■ You must comply with the routing direction of power cables in the current transformer primary. Cables enter in "P1" and leave in "P2" to the loads.

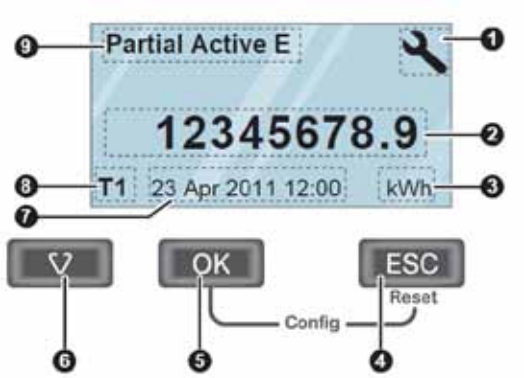
DB114264



Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

Acti 9 iEM3100 energy meter

Acti 9 iEM3255 energy meter



Front of meter parts
1 Configuration mode
2 Values and parameters
3 Unit
4 Cancellation
5 Confirmation
6 Selection
7 Date and time
8 Tariff currently used (iEM3235, iEM3255, iEM3265, iEM3275)
9 Functions/Measurements

- The Acti 9 iEM3000 Energy Meter Series offers a cost-attractive, competitive range of DIN rail-mounted energy meters ideal for sub-billing and cost allocation applications.

Combined with communication systems, like Smart Link, the Acti 9 iEM3000 Series makes it easy to integrate electrical distribution measurements into customer's facility management systems. It's the right energy meter at the right price for the right job.

Two versions are available: 63A direct measure (iEM3100 models) and current transformers associated meter (iEM3200 models). For each range, eight versions are available to satisfy basic to advanced applications:

- iEM3100/iEM3200: kWh meter with partial counter
- iEM3110/iEM3210: kWh meter with partial counter and pulse output. MID certified.
- iEM3115/iEM3215: multi-tariff meter controlled by digital input or internal clock, MID certified.
- iEM3135/iEM3235: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. M-Bus communication, digital I/O and MID certified.
- iEM3150/iEM3250: kWh meter with partial counter and current, voltage, power measurement. Modbus communication.
- iEM3155/iEM3255: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. Modbus communication, digital I/O, MID certified.
- iEM3165/iEM3265: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. BACnet communication, digital I/O and MID certified.
- iEM3175/iEM3275: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. LON communication, digital input and MID certified.

Innovative design makes the meters smart and simple:
- Easy to install for panel builders
- Easy to commission for contractors and installers
- Easy to operate for end users

Applications
Cost management applications
- Bill verification
- Sub-billing, including WAGES view (four user-defined tariffs)
- Cost allocation, including WAGES view

Network management applications
- Basic electrical parameters like current, voltage and power
- Onboard overload alarm to avoid circuit overload and trip
- Easy integration with PLC systems by input/output interface

Market segments
- Buildings & Industry
- Data centres and networks
- Infrastructure (airports, road tunnels, telecom)

Characteristics
- Self-powered meters
- Chain measurement (meters + CTs) accuracy class 1
- Compliance with IEC 61557-12, IEC 62053-21/22, IEC 62053-23, EN50470-3
- Compact, 5 module width
- Graphical display for easy viewing
- Onboard Modbus, LON, M-Bus or BACnet communication
- Easy wiring (without CTs) Acti 9 iEM3100 models
- Double fixation on DIN rail (horizontal or vertical)
- Anti-tamper security features ensure the integrity of your data
- MID compliant (selected models) providing certified accuracy and data security

Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

Function guide		iEM3100	iEM3110	iEM3115	iEM3135	iEM3150	iEM3155	iEM3165	iEM3175	iEM3200	iEM3210	iEM3215	iEM3235	iEM3250	iEM3255	iEM3265	iEM3275
Direct measurement (up to 63 A)		■	■	■	■	■	■	■	■								
Measurement inputs through CTs (1 A, 5A)										■	■	■	■	■	■	■	■
Measurement inputs through VTs													■	■	■	■	■
Active energy measurements class (total & partial kWh)		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Four Quadrant Energy measurements					■		■	■	■				■		■	■	■
Electrical measurements (I, V, P, etc.)					■	■	■	■	■				■	■	■	■	■
Multi-tariff (internal clock)				4	4		4	4	4			4	4		4	4	4
Multi-tariff (external control)				4	2		2	2	2			4	2		2	2	2
Measurement display (number of lines)		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Digital inputs	Programmable (Tariff control or WAGES input)				1		1	1	1				1		1	1	1
	Tariff control only			2								2					
Digital ouputs	Programmable (kWh pulse or kW alarm)				1		1	1					1		1	1	
	kWh pulse only		1								1						
kW overload alarm					■		■	■	■				■		■	■	■
M-Bus					■								■				
Modbus						■	■							■	■		
BACnet								■								■	
LON									■								■
MID (legal metrology certification)			■	■	■		■	■	■		■	■	■		■	■	■
Width (18 mm module in DIN Rail mounting)		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

PB108410

Acti 9 iEM3100 models direct connected (63 A)

PB108424

Acti 9 iEM3200 models (1 A / 5 A CT connected)

Connectivity advantages	
Programmable digital input	External tariff control signal (4 tariffs) Remote Reset partial counter External status, e.g. breaker status Collect WAGES pulses
Programmable digital output	kWh overload alarm (iEM3135, iEM3155, iEM3165 iEM3235, iEM3255, iEM3265) kWh pulses
Graphic LCD display	Scroll energies Current, voltage, power, frequency, power factor
Communication	Serial communication options are available with M-Bus, Modbus, BACnet or LON protocols
Standards	
IEC standards	IEC 61557-12, IEC 61036, IEC 61010, IEC 62053-21/22 Class 1 and Class 0.5S, IEC 62053-23
MID	EN 50470-1/3

Multi-tariff capability

The Acti 9 iEM3000 Series allows arrangement of kWh consumption in four different registers. This can be controlled by:

- Digital Inputs. Signal can be provided by PLC or utilities
- Internal clock programmable by HMI
- Through communication

This function allows users to:

- Make tenant metering for dual source applications to differentiate backup source or utility source
- Understand well the consumption during working time and non working time, and between working days and weekends
- Follow up feeders consumption in line with utility tariff rates

Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

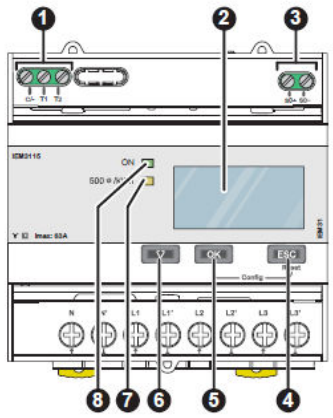
Specification guide	iEM3100 Models							
	iEM3100	iEM3110	iEM3115	iEM3135	iEM3150	iEM3155	iEM3165	iEM3175
Current (max.) Direct connected	63 A							
Meter constant LED	500/kWh							
Pulse output		Up to 1000p/kWh		Up to 1000p/kWh		Up to 1000p/kWh		
Multi-tariff			4 tariffs	4 tariffs		4 tariffs		
Communication				M-bus	Modbus	Modbus	BACnet	LON
DI/DO		0/1	2/0	1/1		1/1	1/1	1/0
MID (EN50470-3)		■	■	■		■	■	■
Network	1P+N, 3P, 3P+N							
Accuracy class	Class 1 (IEC 62053-21 and IEC61557-12) Class B (EN50470-3)							
Wiring capacity	16 mm²							
Display max.	LCD 99999999.9kWh							
Voltage (L-L)	3 x 100/173 Vac to 3 x 277/480 Vac (50/60 Hz)							
IP protection	IP40 front panel and IP20 casing							
Temperature	-25°C to 55°C (K55)							
Product size	10 steps of 9mm							
Overvoltage and measurement	Category III, Degree of pollution 2							
kWh	■	■	■	■	■	■	■	■
kVARh				■		■	■	■
Active power				■	■	■	■	■
Reactive power				■		■	■	■
Currents and voltages				■	■	■	■	■
Overload alarm				■		■	■	■
Hour counter				■		■	■	■

Specification guide	iEM3200 Models							
	iEM3200	iEM3210	iEM3215	iEM3235	iEM3250	iEM3255	iEM3265	iEM3275
1 A / 5 A CTs (max current)	6 A							
Meter constant LED	5000/kWh							
Pulse output frequency		Up to 500p/kWh		Up to 500p/kWh		Up to 500p/kWh		
Multi-tariff			4 tariffs	4 tariffs		4 tariffs		
Communication				M-bus	Modbus	Modbus	BACnet	LON
DI/DO		0/1	2/0	1/1		1/1	1/1	1/0
MID (EN50470-3)		■	■	■		■	■	■
Network	1P+N, 3P, 3P+N support CTs			1P+N, 3P, 3P+N support CTs & VTs				
Accuracy class	Class 0.5S (IEC 62053-22 and IEC61557-12) Class C (EN50470-3)(1)							
Wiring capacity	6 mm² for currents and 4 mm² for voltages							
Display max.	LCD 99999999.9kWh or 99999999.9MWh							
Voltage (L-L)	3 x 100/173 Vac to 3 x 277/480 Vac (50/60 Hz)							
IP protection	IP40 front panel and IP20 casing							
Temperature	-25°C to 55°C (K55)							
Product size	10 steps of 9mm							
Overvoltage & measurement	Category III, Degree of pollution 2							
kWh	■	■	■	■	■	■	■	■
kVARh				■		■	■	■
Active power				■	■	■	■	■
Reactive power				■		■	■	■
Currents and voltages				■	■	■	■	■
Overload alarm				■		■	■	■
Hour counter				■		■	■	■

(1) For 1 A CTs Class 1 (IEC6253-21 and IEC61557-12 Class B (EN50470-3)

Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

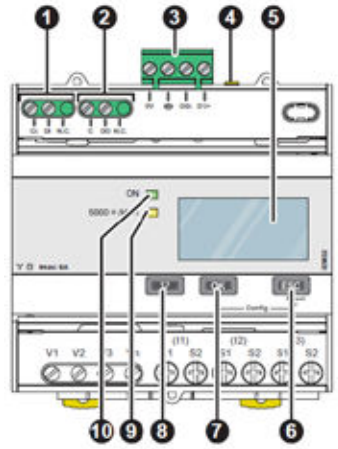
PB105313



Acti 9 iEM3000 Series parts

1. Digital inputs for tariff control (iEM3115 / iEM3215)
2. Display for measurement and configuration
3. Pulse out for remote transfer (iEM3110 / iEM3210)
4. ESC Cancellation
5. OK Confirmation
6. Selection
7. Flashing yellow meter indicator to check accuracy
8. Green indicator: on/off, error

PB1053241



iEM3x50 and iEM3x55 Comm./terminal parts

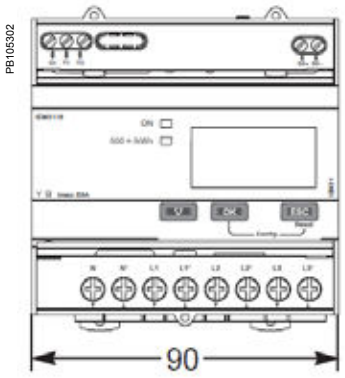
1. Digital input for tariff control (iEM3155 / iEM3255)
2. Digital output (iEM3155/iEM3255)
3. Communication port
4. Yellow indicator for communication diagnosis
5. Display for measurement and configuration
6. ESC Cancellation
7. OK Confirmtion
8. Selection

9 Flashing yellow meter indicator to check accuracy
10 Green indicator: on/off, error

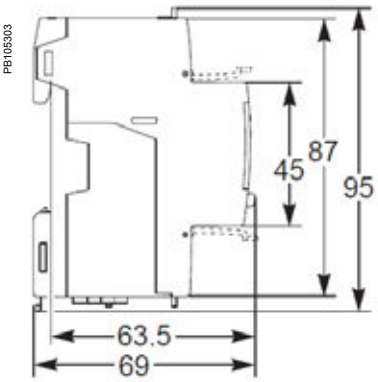
***Note**: For further information please see the Installation Guide and User Guide documents for these products.*

iEM3000 series dimensions

PB105302

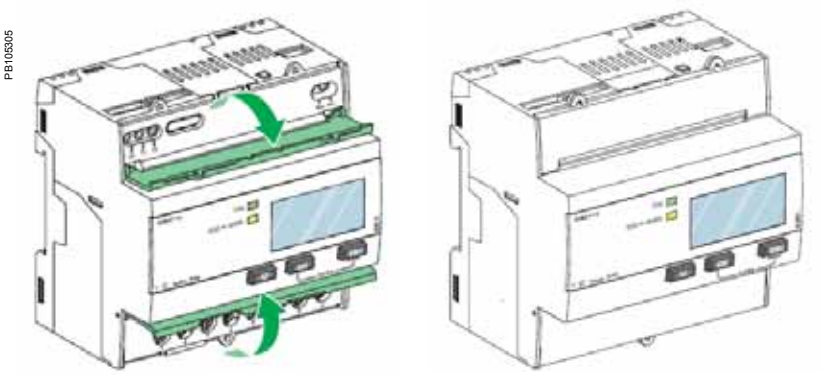


PB105303



Acti 9 iEM3000 Series front flaps open and closed

PB105305



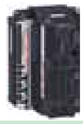
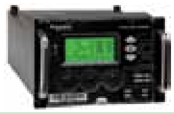
Meter model and description	Current measurement	Part no.
iEM3100 basic energy meter	Direct connected 63 A	**A9MEM3100**
iEM3110 energy meter with pulse output	Direct connected 63 A	**A9MEM3110**
iEM3115 multi-tariff energy meter	Direct connected 63 A	**A9MEM3115**
iEM3135 advanced multi-tariff energy meter & electrical parameter plus M-Bus comm port	Direct connected 63 A	**A9MEM3135**
iEM3150 energy meter & electrical parameter plus Modbus RS485 comm port	Direct connected 63 A	**A9MEM3150**
iEM3155 advanced multi-tariff energy meter & electrical parameter plus Modbus RS485 comm port	Direct connected 63 A	**A9MEM3155**
iEM3165 advanced multi-tariff energy meter & electrical parameter plus BACnet MS/TP comm port	Direct connected 63 A	**A9MEM3165**
iEM3175 advanced multi-tariff energy meter & electrical parameter plus LON TP/FT-10 comm port	Direct connected 63 A	**A9MEM3175**
iEM3200 basic energy meter	Transformer connected 5 A	**A9MEM3200**
iEM3210 energy meter with pulse output	Transformer connected 5 A	**A9MEM3210**
iEM3215 multi-tariff energy meter	Transformer connected 5 A	**A9MEM3215**
iEM3235 advanced multi-tariff energy meter & electrical parameter plus M-Bus comm port	Transformer connected 5 A	**A9MEM3235**
iEM3250 energy meter & electrical parameter plus Modbus RS485 comm port	Transformer connected 5 A	**A9MEM3250**
iEM3255 advanced multi-tariff energy meter & electrical parameter plus Modbus RS485 comm port	Transformer connected 5 A	**A9MEM3255**
iEM3265 advanced multi-tariff energy meter & electrical parameter plus BACnet MS/TP comm port	Transformer connected 5 A	**A9MEM3265**
iEM3275 advanced multi-tariff energy meter & electrical parameter plus LON TP/FT-10 comm port	Transformer connected 5 A	**A9MEM3275**

Product selection according to measurement functions

	Multi-circuit Metering		Basic multi-function Metering			Intermediate Metering
						
	BCPM	**EM4800**	**ION6200**	**PM3200/PM3210/ PM3250/PM3255**	**PM5100/PM5300/ PM5500**	**PM810/PM820/ PM850/PM870**
General selection criteria						
Installation	Inside panel	On DIN rail	Flush mount	Flush mount	Flush mount	Flush or DIN rail mount
Use on LV distribution systems	■	■	■	■	■	■
Use on LV and HV distribution systems	-	-	-	-	■	■
Current / voltage accuracy	1 %	0.5 %	0.5 %	1 %		0.5 % current 0.2 % voltage
Power / active energy accuracy	1 %	1 %	Class 1 IEC 62053-21 Class 1 IEC 61557-12	Class 1 IEC 62053-21 Class 2 IEC 62053-23 Class 0.5 S IEC 62053-22	For PM55xx: Class 0.2 S IEC 62053-22 For PM51/53xx: Class 0.5 S IEC 62053-22	Class 0.5S IEC 62053-22 Class 0.2S ANSI 12.20
Instantaneous rms values						
Current ■ Phases	■	■	■	■	■	■
■ Neutral	■	■	■	■	■	■
■ Extended Measurement range	-	-	-	-	-	-
3 - Phase Voltage	■	■	■	■	■	■
Voltage per phase	■	■	■	■	■	■
Frequency	■	■	■	■	■	■
Total power ■ Active	■	■	■	■	■	■
■ Reactive	-	■	■	■	■	■
■ Apparent	-	■	■	■	■	■
Power per phase ■ Active	■	■	■	■	■	■
■ Reactive	-	■	■	■	■	■
■ Apparent	-	-	■	■	■	■
Power factor ■ Total	■	■	■	■	■	■
■ Per phase	■	-	■	■	■	■
Energy values						
Active energy	■	■	■	■	■	In/Out
Reactive energy	-	■	■	■	■	In/Out
Apparent energy	-	-	■	■	■	■
User-set accumulation mode	-	-	-	-	-	■
Demand values						
Current - Present and maximum values	■	-	■	■	■	■
Total active power - Present and maximum values	■	■ (3)	■	■	■	■
Total reactive power - Present and maximum values	-	■ (3)	■	■	■	■
Total apparent power - Present and maximum values	-	■ (3)	■	■	■	■
Total predicted demand - kW, kVAR, kVA	-	-	-	-	-	■
Synchronisation of calculation window	-	-	-	-	-	■
User-set calculation mode	-	-	-	1 parameter	■	■
Other measurements						
Hour counter	-	■	■	iEM31552and iEM3255	■	■

(1) Measurement sensors included.
(2) Available with Micrologic E associated to Compact NS630b...3200, Masterpact NT, Masterpact NW.
(3) Active power or reactive power or apparent power.

Product selection according to measurement functions (cont.)

		Advanced Metering		Advanced Utility Metering	
					
	ION7330/7350	ION 7550 / ION 7650	CM4000T	ION8650 A / B / C	ION8800 A / B / C
	Flush mount	DIN 192 standard cutout–186x186 mm	Backplate mount	ANSI socket, mount 9S, 35S, 36S; FT21switchboard case	DIN 43862 rack
	■	■	■	■	■
	■	■	■	■	■
	0.5 % reading	0.1 % reading	0.07 %	0.1 % reading	0.1 % reading
	0.5 %	0.20 %	0.20 %	0.20 %	0.20 %
	■	■	■	■	■
	■	■	■	■	■
	-	■	■	-	-
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	■	■	■	■	■
	-	-	-	-	-

Product selection according to measurement functions (cont.)

		Multi-circuit Metering		Basic multi-function Metering			Intermediate Metering
							
		BCPM	EM4800	ION6200	PM3200/PM3210/ PM3250/PM3255	PM5100/PM5300/ PM5500	PM810/PM820/ PM850/PM870
Power quality measurement							
Interharmonics		-	-	-	-	-	-
Total harmonic distortion	Voltage	-	-	■	■	■	■
	Current			■	■		■
Individual harmonic content (current & voltage)		-	-	-	-	■	31 (1)
Waveform capture		-	-	0.5 %	1 %		-
Detection of voltage sags and swells		-	-	Class 1 IEC 62053-21 Class 1 IEC 61557-12	-	■	-
Programmable (logic and mathematical functions)		-	-	■	-	■	-
Detection & capture of transients		-	-	-	■	■	-
Flicker		-	-	-	-	-	-
EN 50160 compliance checking		-	-	-	■	■	-
IEC 61000-4-30 compliance		-	-	-	■	■	-
True rms measurement Maximum harmonic number		-	15	-	■	■	63
Sampling rate Points per cycle		-	-	■	32	■	128
Data recording							
Min/Max of instantaneous values		-	-	■	■	■	■
Data logging		-	-	■	■	■	2 (1)
Event logging		-	-	■	■	■	■
Trend curves		-	-	-	-	-	-
Alarms		■	-	-	-	-	■
Alarm notification via email		-	-	-	-	-	Optional with PM8ECC Card
Sequence of Events Recording		-	-	-	-	-	-
Date and time stamping		-	-	-	-	-	■ (1)
GPS time synchronisation		-	-	-	-	-	■ (1)
Storage capacity		-	-	-	-	256 kB / 1.1 MB	80 kB (1)
Display, sensors, inputs/outputs							
Front-panel display		-	■	■	■	■	■
Built-in current and voltage sensors		-	-	■	■	■	-
Digital or analogue inputs (max. number)		-	2	■	■	2/4	13 digit. / 4 analogue
Pulse outputs		-	1 (PM9P)	2	■	1	1
Digital or analogue outputs (max. number including pulse outputs)		-	-	2	-	2	5 digit. / 4 analogue
Direct voltage connections without external VT		277 V L-N 480 V L-L	277 V L-N 480 V L-L	400 V L-N 690 V L-L	-	277 V L-N 400 V L-L	347 V L-N 600 V L-L
Power supply							
AC/DC version	AC	90 - 277 V		100 - 240 V	20 V L-N / 35 V L-L to 277 V L-N /480 V L-L	115 to 415 ±10 % V AC, 15 VA 45-67 Hz or 350-450 Hz	115 to 415 ±10 % V AC, 15 VA 45-67 Hz or 350-450 Hz
	DC	-		110 - 300 V	100 - 300 V	125-250V DC ±20%	125 to 250 ±20 % V DC, 10W
DC version		-	-	-	-	-	-
Communication							
RS 485 port		■	-	Option	■	■	2- wire (on board)
Infra-red port		-	-	-	-	-	-
RS 232 port		-	-	-	-	-	With remote display
Modbus (M)		M	M	M	M	M	M

(1) With PM810LOG
(2) Configurable.
(3) Except for interharmonics, signalling voltage, flicker and transients.meter's front panel.
***(4)** Maximum only.*
***(5)** Self-powered.*
***(6)** The ION8600 and ION8800 do trending with software but not from the meter's front panel.*

Product selection according to measurement functions (cont.)

	Advanced Metering			Advanced Utility Metering					
									
	ION7330/7350	ION 7550	ION 7650	CM4000T	ION8650 A	B	C	ION8800 A	B	C
	-	-	■	-	-			■		
	■	■		■	■			■		
		■		■	■			■		
	■	■		■	■			■		
	0.5 % reading	-	■	0.07 %	■	-		■		
	0.5 % ■	■ ■		0.20 % ■	■ ■			■ ■		
	■	-	20 µs	■	78 µs	-		20 µs	-	
	-	-	■	■	■	-		■		-
	■	-	■	■	■	-		■		-
	■	-	■	■	-	-		■		-
	■	63		■	63			63		
	■	256	1024	■	256			1024		
	■	■		■	■			■		
	■	■		■	■			■		
	■	■		■	■			■		
	■	■		-	- (6)			-		
	■	■		-	■			■		
	■	■		-	■			■		
	■	■		-	■			■ (7)		
	■	■		-	■			■		
	■	■		-	■			■		
	300 kB	Up to 10 MB		-	10 MB	4 MB	2 MB	Up to 10 MB		
	■	■		■	■			■		
	■	-		■	-			-		
	4	20		■	11			3		
	4	1		■	2			1		
	4	12		■	14			13		
	347 V L-N 600 V L-L	347 V L-N 600 V L-L		■	277 V L-N (9S, 36S) 480 V L-L (35S)			288 V L-N 500 V L-L		
	95 - 240 VAC (+ 10%), (47 - 440 Hz)	85 to 240 V		-	120 to 227 V, 120 to 480 V (35S) / 57 to 70 V / 65 to 120 V / 160 to 277 V			85 to 240 V (+/- 10 %) 47-63 Hz		
	120 - 310 VDC (+ 10%) 0.2 A worst case loading (12 W) at 100 VAC at 25°C	110 to 300 V		-	80 to 160 V / 200 to 350 V			110 to 270 V (+/- 10 %)		
	-	-		-	-			-		
	1/2	■		-	■			Option		
	■	■		-	■			■		
	-	■		-	■			Option		
	M	M		-	M			M		

PowerLogic BCPM
Functions and characteristics

PE86166

PowerLogic™ BCPM board

PE86281

PowerLogic™ BCPM split core 12, 18, and 21 CTs strips

PowerLogic™ BCPM split core CT

The ideal solution for data centre managers, engineers and operational executives who are responsible for delivering power to critical applications. In corporate and hosted data centre facilities, this technology helps you plan and optimise the critical power infrastructure to meet the demands of continuous availability.

The PowerLogic BCPM is a highly accurate, full-featured metering product designed for the unique, multi-circuit and minimal space requirements of a high performance power distribution unit (PDU) or remote power panel (RPP).

The BCPM monitors up to 84 branch circuits with a single device and also monitors the incoming power mains to provide information on a complete PDU. Full alarming capabilities ensure that potential issues are dealt with before they become problems.

Unlike products designed for specific hardware, the flexible BCPM will fit any PDU or RPP design and supports both new and retrofit installations. It has exceptional dynamic range and accuracy, and optional feature sets to meet the energy challenges of mission critical data centres.

Applications

Data Centre load monitoring and alarming
Comprehensive monitoring of lighting control panels
Maximise uptime and avoid outages.
Optimise existing infrastructure.
Effectively plan future infrastructure needs.
Improve power distribution efficiency.
Track usage and allocate energy costs.
Enable accurate sub-billing.

Main characteristics

Monitor up to 84 branch circuits with a single BCPM.

Ideal for installation in both new PDUs and retrofit projects

New installations: BCPM with solid core CTs monitors up to 84 branch circuits using 2 or 4 CT strips. Solid core CTs are rated to 100 A CTs and are mounted on strips to simplify installation. CT strips are available with 12, 15 or 21 CTs per strip on 18 mm spacings. 21 CT strips with 3/4" or 1" spacings are also available.

Retrofit projects: BCPMSC with split core CTs is ideal for retrofits. Any number of split core CTs, up to 84 maximum, can be installed with a single BCPM. Three sizes of CT are supported (50 A, 100 A, and 200 A) and all three CT sizes can be used on a single BCPM. Adapter boards with terminals for split-core CTs can be mounted using DIN-rail, Snaptrack or on a common mounting plate with the main board (42 ch Y63 models only).

IEC Class 1 metering accuracy
Accurately monitor very low current levels, down to a quarter-Amp.
Easily differentiate between the flow of low current and a trip where no current flows.

Designed to fit any PDU or RPP design
Lowers your total installation costs as well as the cost per meter point by supporting both new and retrofit installations.

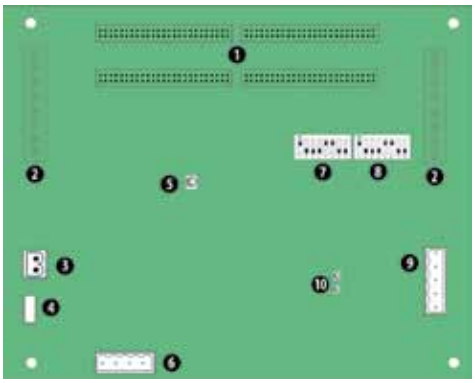
Modbus RTU protocol
Integrates easily into existing networks using Modbus communications. Optional Ethernet interfaces:

Optional Ethernet interfaces
Add Modbus TCP support with a Modbus gateway (EGX) or BACnet IP (and MS/TP) with the E8950*.

Compatible with PowerLogic power monitoring software
Easily turn the large amount of data collected by the devices into useful decision-making information.

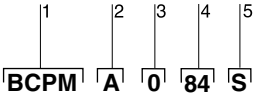
Flexible Configuration capability
Set the ordering and orientation of CT strips, assign individual CT size and phases, support for 1, 2, and 3-pole breakers.

PowerLogic BCPM
Functions and characteristics (cont.)



PowerLogic BCPM
1 *50-pin ribbon cable connectors (data acquisition board).*
2 *Auxiliary inputs.*
3 *Control (mains) power connection.*
4 *Control power fuse.*
5 *Alive LED.*
6 *Voltage taps.*
7 *Communications address DIP switches.*
8 *Communications settings DIP switch.*
9 *RS-485 2 connection.*
10 *RS-485 LEDs.*

PE86168



Example BCPM with solid core CTs part number.

1 *Model.*
2 *Feature set.*
3 *CT spacing (solid-core models only)*
4 *Number of circuits.*
5 *Brand.*

The PowerLogic BCPM uses .333 VAC output split-core CTs for the auxiliary inputs. These CTs are ordered separately from the BCPM.

Selection guide		BCPMA	BCPMB	BCPMC
General				
Use on LV systems		■	■	■
Power and energy measurements				
Mains		■	■	-
Branch circuits		■	-	-
Instantaneous rms values				
Current, voltage, frequency		■	■	-
Active power	Total and per phase	■	■ (mains only)	-
Power factor	Total and per phase	■	■ (mains only)	-
Energy values				
Active energy		■	■ (mains only)	-
Demand values				
Total active power	Present and max. values	■	■ (mains only)	-
Power quality measurements				
Detection of over-voltage/under-voltage		■	■	-
Sampling rate Points per cycle		2560 Hz	2560 Hz	2560 Hz
Alarming				
Alarms		■	■	■
Power supply				
AC version		90-277 V ac	90-277 V ac	90-277 V ac
Communication				
RS 485 port		1	1	1
Modbus protocol		■	■	■
Modbus RTU (Ethernet) optional, add EGX		■	■	■
BACnet IP (Ethernet) optional, add E8950		■	■	■
BACnet MS/TP (RS 485) optional, add E8950		■	■	■

BCPM part numbers

	Item	Code	Description
1	Model	BCPM	BCPM with solid core CTs. Highly accurate meter that monitors branch circuits and the incoming power mains and includes full alarming capabilities
2	Feature set	A	Advanced - Monitors power & energy per circuit & mains
		B	Intermediate - Monitors current per circuit, power and energy per mains
		C	Basic - Monitors current only per circuit & mains
3	CT spacing	0	19 mm CT spacing
		1	26 mm CT spacing
		2	18 mm CT spacing
4	Number of circuits	84	84 circuits, (4) 21CT strips
		72	72 circuits, (4) 18CT strips (18 mm spacing only)
		42	42 circuits, (2) 21CT strips
5	Brand	S	Schneider Electric
BCPM with split core CTs			
	Model	BCPMSC	BCPM with split core CTs. Highly accurate meter that monitors branch circuits and the incoming power mains and includes full alarming capabilities
2	Feature set	A	Advanced - Monitors power and energy per circuit and mains
		B	Intermediate - Monitors current per circuit, power and energy per mains
		C	Basic - Monitors current only per circuit and mains
4	Number of circuits	1	42 circuits (no CTs, order separately)
		2	84 circuits (no CTs, order separately)
		Y63	42 circuits with main and adapter boards on single mounting plate
		30	30 split core CTs (50 A)
		42	42 split core CTs (50 A)
		60	60 split core CTs (50 A)
		84	84 split core CTs (50 A)
5	Brand	S	Schneider Electric

PowerLogic BCPM
Functions and characteristics (cont.)

PowerLogic BCPM specifications		
Electrical characteristics		
Type of measurement		
Accuracy	Power/energy	IEC 62053-21 Class 1, ANSI C12.1-2008
	Voltage	±0.5% of reading 90-277V line-to-neutral
	Solid Core CT: 50A Split-Core CT: 100A Split-Core CT: 200A Split-Core CT:	±0.5% ±1% ±0.5% ±1%
Data update rate		1.8 seconds
Input-voltage characteristics	Measured voltage	150 – 480 V ac L-L (1) – 277 V ac L-N (1) 90
	Measurement range	150 – 480 V ac L-L (1) – 277 V ac L-N (1) 90
Power supply	AC	90 – 277 V ac (50/60 Hz)
Mechanical characteristics		
Weight		1.5 kg
Dimensions	Circuit board	288 x 146 mm
Environmental conditions		
Operating temperature		0 to 60ºC
Storage temperature		-40ºC to 70ºC
Installation category		CAT III
Safety		
Europe		IEC 61010
U.S. and Canada		UL 508 Open type device
Communication		
RS 485		Baud rate: DIP-switch selectable 9600, 19200, 38400 DIP-switch selectable 2-wire or 4-wire RS-485
Protocol		Modbus RTU. Modbus TCP can be added with optional gateway (EGX). BACnet MS/TP and BACnet IP available with optional gateway (E8950) (2)
Firmware characteristics		
Detection of over-voltage/under-voltage		User-defined alarm thresholds for over-voltage and under-voltage detection
Alarms		Four alarm levels: high-high, high, low and low-low (users define the setpoints for each). Each alarm has a latching status to alert the operator that an alarm has previously occurred. High and Low alarms have instantaneous status to let the operator know if the alarm state is still occurring.
Firmware update		Update via the RS-485 port

(1) Feature sets 'A' and 'B' only.

(2) E8950 supports the BCPMAxx42,BCPMBxxx, BCPMCxxxx, BCPMSCBxx, and BCPMSCCxx - (BCPMAx84 and BCPMSCAxx models are not supported).

1/3 V low-voltage CT (LVCT) specifications	
Electrical characteristics	
Accuracy	1% from 10% to 100% of rated current
Frequency range	50/60 Hz
Leads	18 AWG, 600 V ac, UL 1015 twisted pair, 1.8m standard length
Max. voltage L-N sensed conductor	600 V ac
Environmental conditions	
Operating temperature	-15ºC to 60ºC
Storage temperature	-40ºC to 70ºC
Humidity range	0 to 95% non-condensing

PowerLogic BCPM
Functions and characteristics (cont.)

PE86284

Flat ribbon cable

cbl022.jpg

Round ribbon cable

Cabling and connection

Round ribbon cable is recommended for use when
the BCPM printed circuit board will be mounted outside of the PDU that is being monitored. Round ribbon cable is the prefered choice when the ribbon cable will be threaded through conduit.

Flat ribbon cable is recommended for projects where the BCPM printed circuit board will be installed inside of the PDU that is being monitored.

Flat ribbon cable is more flexible than round ribbon cable and is the preferred choice if the ribbon cable will not be threaded through conduit.

BCPM part numbers for solid and split core CTs (contd.)

Part number	Description
BCPMA084S	BCPM Advanced feature set, 84 solid core 100 A CTs, 19 mm CT spacing
BCPMA184S	BCPM Advanced feature set, 84 solid core 100 A CTs, 26 mm CT spacing
BCPMA042S	BCPM Advanced feature set, 42 solid core 100 A CTs, 19 mm CT spacing
BCPMA142S	BCPM Advanced feature set, 42 solid core 100 A CTs, 26 mm CT spacing
BCPMA224S	BCPM Advanced feature set, 24 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMA236S	BCPM Advanced feature set, 36 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMA242S	BCPM Advanced feature set, 42 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMA248S	BCPM Advanced feature set, 48 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMA272S	BCPM Advanced feature set, 72 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMA284S	BCPM Advanced feature set, 84 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMB084S	BCPM Intermediate feature set, 84 solid core 100 A CTs, 19 mm CT spacing
BCPMB184S	BCPM Intermediate feature set, 84 solid core 100 A CTs, 26 mm CT spacing
BCPMB042S	BCPM Intermediate feature set, 42 solid core 100 A CTs, 19 mm CT spacing
BCPMB142S	BCPM Intermediate feature set, 42 solid core 100 A CTs, 26 mm CT spacing
BCPMB224S	BCPM Intermediate feature set, 24 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMB236S	BCPM Intermediate feature set, 36 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMB242S	BCPM Intermediate feature set, 42 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMB248S	BCPM Intermediate feature set, 48 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMB272S	BCPM Intermediate feature set, 72 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMB284S	BCPM Intermediate feature set, 84 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMC084S	BCPM Basic feature set, 84 solid core 100 A CTs, 19 mm CT spacing
BCPMC184S	BCPM Basic feature set, 84 solid core 100 A CTs, 26 mm CT spacing
BCPMC042S	BCPM Basic feature set, 42 solid core 100 A CTs, 19 mm CT spacing
BCPMC142S	BCPM Basic feature set, 42 solid core 100 A CTs, 26 mm CT spacing
BCPMC224S	BCPM Basic feature set, 24 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMC236S	BCPM Basic feature set, 36 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMC242S	BCPM Basic feature set, 42 solid core 100 A CTs (2 strips), 18 mm CT spacing
BCPMC248S	BCPM Basic feature set, 48 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMC272S	BCPM Basic feature set, 72 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPMC284S	BCPM Basic feature set, 84 solid core 100 A CTs (4 strips), 18 mm CT spacing
BCPM with split core	
BCPMSCA1S	BCPM feature set A, 42 circuit split core CT power and energy meter, CTs sold separately
BCPMSCA2S	BCPM feature set A, 84 circuit split core CT power and energy meter, CTs sold separately
BCPMSCA30S	BCPM feature set A, 30 circuit split core CT power and energy meter, CTs rated to 50 A
BCPMSCA42S	BCPM feature set A, 42 circuit split core CT power and energy meter, CTs rated to 50 A
BCPMSCA60S	BCPM feature set A, 60 circuit split core CT power and energy meter, CTs rated to 50 A
BCPMSCAY63S	BCPM feature set A, 42 circuit split core power and energy meter - all boards on backplate, 50A CTs
BCPMSCA84S	BCPM feature set A, 84 circuit split core CT power and energy meter, CTs rated to 50 A
BCPMSCB1S	BCPM feature set B, 42 circuit split core CT branch current, mains power meter, no CTs
BCPMSCB2S	BCPM feature set B, 84 circuit split core CT branch current, mains power meter, no CTs
BCPMSCB30S	BCPM feature set B, 30 circuit split core CT branch current, mains power meter, 50 A CTs
BCPMSCB42S	BCPM feature set B, 42 circuit split core CT branch current, mains power meter, 50 A CTs
BCPMSCB60S	BCPM feature set B, 60 circuit split core CT branch current, mains power meter, 50 A CTs
BCPMSCBY63S	BCPM feature set B, 42 circuit split core CT branch current, mains - all boards on backplate, 50 A CTs
BCPMSCB84S	BCPM feature set B, 84 circuit split core CT branch current, mains power meter, 50 A CTs
BCPMSCC1S	BCPM feature set C, 42 circuit split core CT current meter, CTs sold separately
BCPMSCC2S	BCPM feature set C, 84 circuit split core CT current meter, CTs sold separately
BCPMSCC30S	BCPM feature set C, 30 circuit split core CT current meter, CTs rated to 50 A
BCPMSCC42S	BCPM feature set C, 42 circuit split core CT current meter, CTs rated to 50 A
BCPMSCC60S	BCPM feature set C, 60 circuit split core CT current meter, CTs rated to 50 A
BCPMSCCY63S	BCPM feature set C, 42 circuit split core CT current meter , all boards on backplate, 50A CTs 50 A
BCPMSCC84S	BCPM feature set C, 84 circuit split core CT current meter, CTs rated to 50 A

PowerLogic BCPM
Functions and characteristics (cont.)

PE86183

PowerLogic™ BCPM split core CTs

E682small
E682medium
E682large

PowerLogic™ BCPM solid core CTs (small, medium, large)

The PowerLogic™ BCPM uses .333 VAC output split-core CTs for the auxiliary inputs. These CTs are ordered separately from the BCPM.

BCPM split core accessories	
BCPMSCADPBS	BCPM adapter boards, quantity 2, for split core BCPM
BCPMSCCT0	BCPM 50 A split core CTs, Quantity 6, 1.8 m lead lengths
BCPMSCCT0R20	BCPM 50 A split core CTs, quantity 6, 6 m lead lengths
BCPMSCCT1	BCPM 100 A split core CTs, Quantity 6, 1.8 m lead lengths
BCPMSCCT1R20	BCPM 100 A split core CTs, Quantity 6, 6 m lead lengths
BCPMSCCT3	BCPM 200 A split core CTs, Quantity 1, 1.8 m lead lengths
BCPMSCCT3R20	BCPM 200 A split core CTs, Quantity 1, 6 m lead lengths
Additional accessories for use with BCPM products	
BCPMCOVERS	BCPM circuit board cover
BCPMREPAIR	CT repair kit for solid core BCPM (includes one CT)
H6803R-0100	Additional 108 split core CT for use with solid core repair kit
E8950	Modbus to BACnet protocol converter
CBL008	Flat Ribbon cable (quantity 1) for BCPM, length = 0.45 m
CBL016	Flat Ribbon cable (quantity 1) for BCPM, length = 1.2 m
CBL017	Flat Ribbon cable (quantity 1) for BCPM, length = 1.5 m
CBL018	Flat Ribbon cable (quantity 1) for BCPM, length = 1.8 m
CBL019	Flat Ribbon cable (quantity 1) for BCPM, length = 2.4 m
CBL020	Flat Ribbon cable (quantity 1) for BCPM, length = 3.0 m
CBL021	Flat Ribbon cable (quantity 1) for BCPM, length = 6.1 m
CBL022	Round Ribbon cable (quantity 1) for BCPM, length = 1.2 m
CBL023	Round Ribbon cable (quantity 1) for BCPM, length = 3 m
CBL024	Round Ribbon cable (quantity 1) for BCPM, length = 6.1 m
CBL033	Round Ribbon cable (quantity 1) for BCPM, length = 2.4 m

1/3 V low-voltage CT part numbers

Part number	Amperage rating	Inside dimensions
LVCT00102S	100 A	31 mm x 100 mm
LVCT00202S	200 A	31 mm x 100 mm
LVCT00302S	300 A	31 mm x 100 mm
LVCT00403S	400 A	62 mm x 132 mm
LVCT00603S	600 A	62 mm x 132 mm
LVCT00803S	800 A	62 mm x 132 mm
LVCT00804S	800 A	62 mm x 201 mm
LVCT01004S	1000 A	62 mm x 201 mm
LVCT01204S	1200 A	62 mm x 201 mm
LVCT01604S	1600 A	62 mm x 201 mm
LVCT02004S	2000 A	62 mm x 201 mm
LVCT02404S	2400 A	62 mm x 201 mm

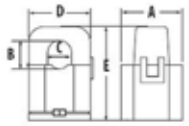
Solid core CT part numbers

Part number	Amperage rating	Inside dimensions
E682A051V3	50A	10 mm
E682A101V3	100A	10 mm
E682C201V3	200A	25 mm
E682D401V3	400A	33 mm

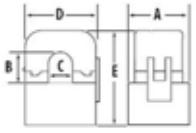
PowerLogic BCPM
Dimensions and connection

PowerLogic BCPM dimensions

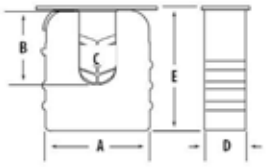
Split-Core CTs



50 Amp
A = 1.0" (26 mm)
B = 0.5" (11 mm)
C = 0.4" (10 mm)
D = 0.9" (23 mm)
E = 1.6" (40 mm)

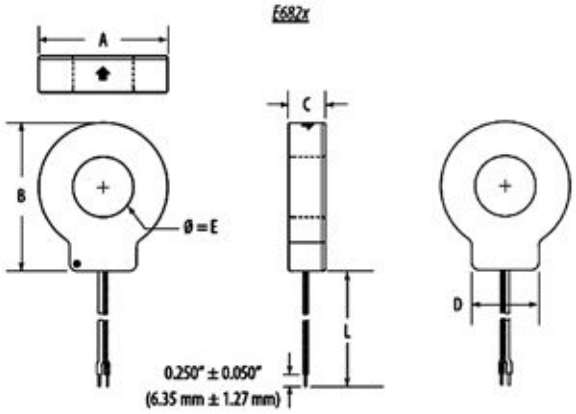


100 Amp
A = 1.2" (29 mm)
B = 0.8" (20 mm)
C = 0.7" (16 mm)
D = 1.6" (40 mm)
E = 2.1" (53 mm)



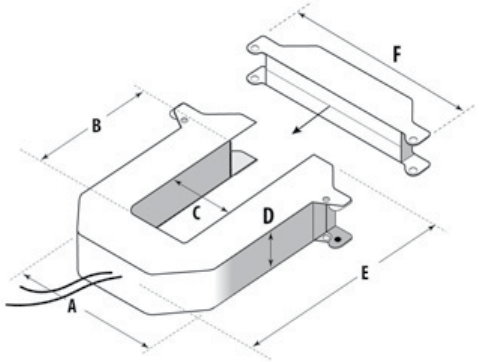
200 Amp
A = 2.6" (66 mm)
B = 1.1" (28 mm)
C = 0.8" (19 mm)
D = 2.9" (74 mm)
E = 3.5" (90 mm)

Solid core CT dimensions



Model	L	A	B	C	D	E
E682A051V3 E682A101V3	6' (1.8 m)	1.3" (33 mm)	1.5" (38 mm)	0.7" (18 mm)	0.8" (21 mm)	0.4" (10 mm)
E682C201V3	6' (1.8 m)	2.3" (59 mm)	2.6" (66 mm)	0.7" (18 mm)	1.2" (31 mm)	1.0" (25 mm)
E682D401V3	6' (1.8 m)	2.8" (70 mm)	3.2" (82 mm)	1.0" (25 mm)	1.4" (36 mm)	1.25" (31 mm)

1/3 V low-voltage CT form factor



PE86183

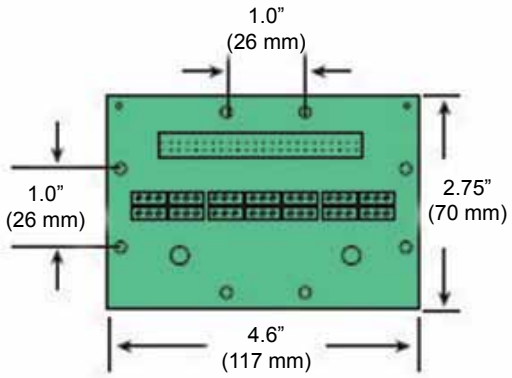
Small form factor
100/200/300 Amp
A = 96 mm
B = 30 mm
C = 31 mm
D = 30 mm
E = 100 mm
F = 121 mm

Medium form factor
400/600/800 Amp
A = 125 mm
B = 73 mm
C = 62 mm
D = 30 mm
E = 132 mm
F = 151 mm

Large form factor
800/1000/1200/
1600/2000/2400 Amp
A = 125 mm
B = 139 mm
C = 62 mm
D = 30 mm
E = 201 mm
F = 151 mm

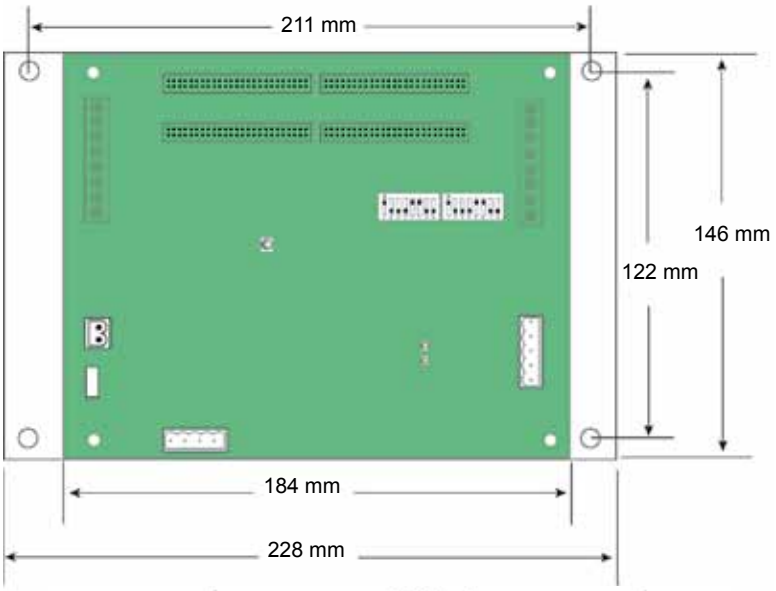
PowerLogic BCPM
Dimensions and connection

PE86286

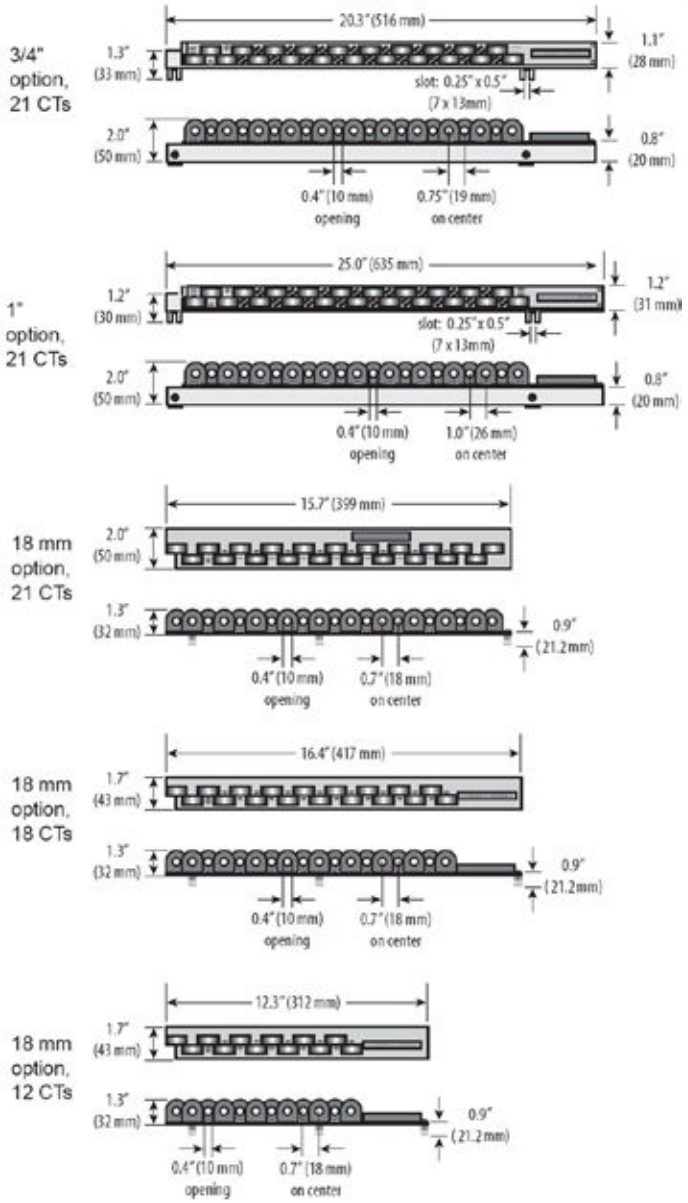


PowerLogic BCPM adapter board (one board per 21 split core branch CTs)

PowerLogic BCPM dimensions



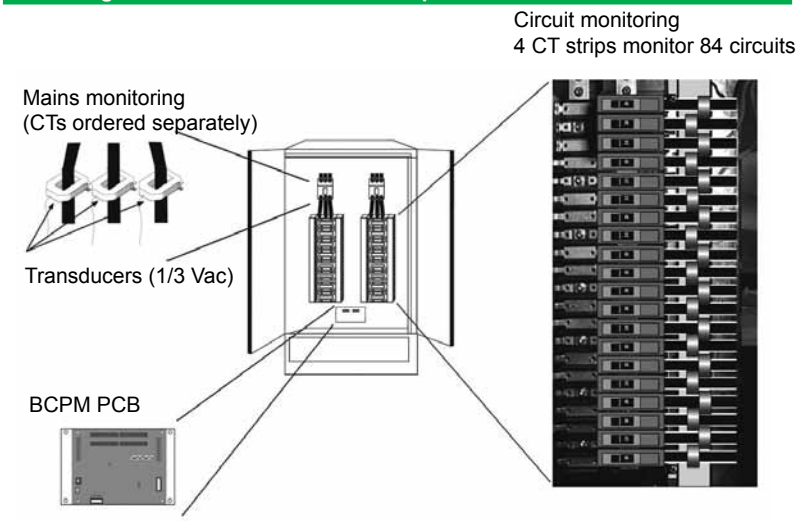
PE86183



PowerLogic BCPM
Dimensions and connection

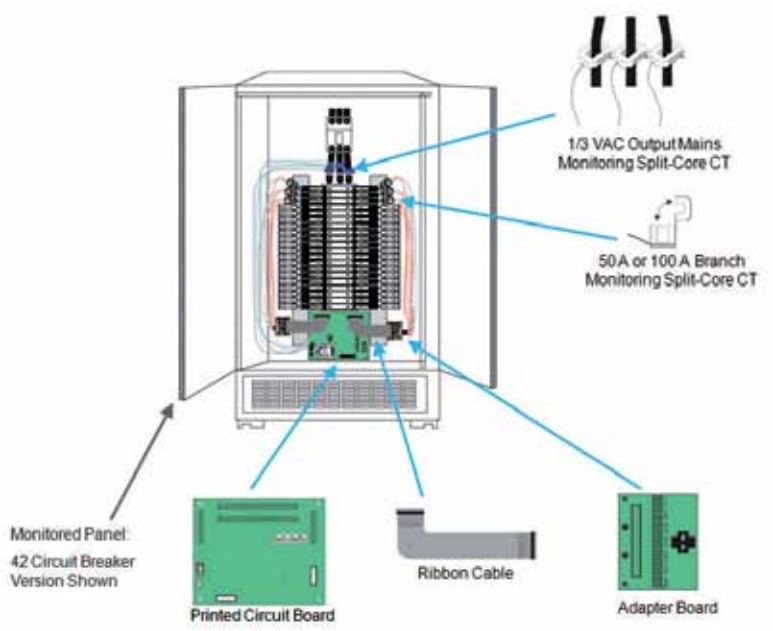
PowerLogic BCPM with solid core CT strips installation details

PE86171



PowerLogic BCPM with split core CTs installation details

PE86287



EM4800 series
Functions and characteristics

PE86325

EM4800 series multi-circuit energy meter front (above), installed in panel (below)

PE86326

The compact PowerLogic EM4800 series multi-circuit energy meter from Schneider Electric enables reliable metering of individual tenants with a low installation cost-per-point by combining revenue-accurate electricity sub-metering with advanced communications technology.

The EM4800 is ideal for multi-tenant or departmental metering applications within office towers, condominiums, apartment buildings, shopping centres and other multi-user environments.

The PowerLogic EM4800 series meters monitor up to 24 tenants with a single device. Multiple meters can be combined to support an unlimited number of suites.

Three meter models offer a choice of CT secondary ratings and installation options:

PowerLogic EM4805: 5 A, split- or solid-core CTs
PowerLogic EM4833: 0.333 V, split- or solid-core CTs
PowerLogic EM4880: 80 mA, solid-core CTs

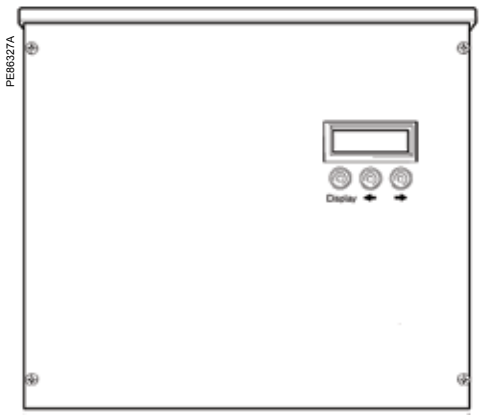
Applications
Multi-tenant metering.
Energy management.
Energy cost allocation.
Utility bill verification.

Main characteristics

Compact, maintenance-free design
Requires no floor space.
Hi-density, flexible connection
From single-pole to single- or three-phase metering -- supports up to 24 circuits.
Select the connection type using an intuitive configuration tool.
Direct connection
For 100 - 300 V ac L-N electrical distribution systems:
120/240 V, 120/208 V, 230/240 V, 220/380 V, 240/415 V, 277/480 V
Multiple CT types
Support a variety of needs in both new and retrofit installations.
1/3 V output CT option does not require shorting blocks, making it the ideal choice for retrofit installations.
No rewiring required
Use existing wiring to connect to existing panels.
Integrated communications
Onboard Ethernet and modem allows for easy integration into existing communications networks.

Model	Description	Part number
EM4805	24 x 5 A inputs, 230/240 V control power, 50 Hz	**METSEEM480525**
	24 x 5 A inputs, 120 V control power, 60 Hz	**METSEEM480516**
	24 x 5 A inputs, 230/240 V control power, 60 Hz	**METSEEM480526**
EM4833	24 x 333 mV inputs, 230/240 V control power, 50 Hz	**METSEEM483325**
	24 x 333 mV inputs, 120 V control power, 60 Hz	**METSEEM483316**
	24 x 333 mV inputs, 230/240 V control power, 60 Hz	**METSEEM483326**
EM4880	24 x 80 mA inputs, 120 V control power, 60 Hz	**METSEEM488016**
	24 x 80 mA inputs, 230/240 V control power, 60 Hz	**METSEEM488026**

EM4800 series
Functions and characteristics (cont.)



PowerLogic EM4800 series digital panel meter.

Selection guide		EM4805	EM4833	EM4880
General				
Use on LV systems		■	■	■
Accuracy	+/- 0.5%	■	■	■
Accuracy compliance	ANSI C12.1 and C12.20 Class 0.5; IEC 62053-22, Class 0.5S	■	■	■
Maximum circuits: single-pole / single phase / three-phase	24 / 12 / 8	■	■	■
Instantaneous rms values				
Energy	real, kWh received/delivered	■	■	■
	reactive, kvarh received/ delivered	■	■	■
	apparent, VAh	■	■	■
Voltage		■	■	■
Pulse counts		■	■	■
Voltage and current	V rms, I rms per phase	■	■	■
Power	real, reactive, apparent	■	■	■
Power factor		■	■	■
Measurements available for data logging				
Energy	real, kWh received/delivered	■	■	■
	reactive, kvarh received/ delivered	■	■	■
	apparent, VAh	■	■	■
Voltage		■	■	■
Display				
Backlit LCD display	2 lines of 16 characters	■	■	■
Optional remote modular display available		■	■	■
Communication				
Ethernet port		■	■	■
V.90 modem port		■	■	■
Pulse inputs	2	■	■	■
Protocols: Modbus TCP/IP, HTTP, BACnet/IP, FTP, and SNTP		■	■	■
Installation options				
5 A CTs		■		
0.333 V CTs			■	
80 mA CTs				■
Split core CT		■	■	
Solid core CT		■	■	■
Remore modular display		■	■	■

EM4800 series
Functions and characteristics (cont.)

Electrical characteristics		
Input-voltage characteristics	Inputs	V1, V2, V3, Vn
	Measured voltage	80 - 480 V AC L-L without PTs Up to 999 kV with external PTs
	Frequency range	50/60 Hz
Mechanical characteristics		
Weight	EM4805	approx. 5.4 kg
	EM4833 / EM4880	approx. 4.0 kg
Dimensions	EM4805	33.5 cm x 44 cm x 5.5 cm (13.125 in x 17 in x 2.125 in)
	EM4833 / EM4880	33.5 cm x 30.5 cm x 5.5 cm (13.125 in x 12 in x 2.125 in)
Environmental conditions		
Operating temperature		-40°C to +70°C
Storage temperature		-40°C to +70°C
Humidity rating		0% to 90 % RH non-condensing
Enclosure		Type 1 (indoor or enclosed outdoor use)
Altitude		3000 m
Pollution degree		2
Safety and standards		
UL Certified to IEC/EA/CSA 61010-1		
CSA-C22.2 No 61010-1-04		
FCC Part 15 Class B		
ICES-003 EN55022, IEC 6100-4-5		
ANSI/TIA968-A: 2002		
Communication		
Ports		Ethernet
		V.90 modem
Pulse inputs		2
Protocols: Modbus TCP/IP, HTTP, BACnet/IP, FTP, and SNTP		
Display characteristics		
Integrated backlit LCD display		2 ines, 16 digits per line display; R / L arrow buttons select metering point; Display button cycles through measurements per point.

ION6200
Functions and characteristics

PE86127

PowerLogic ION6200.

The PowerLogic ION6200 meter offers outstanding quality, versatility, and functionality in a low-cost, ultra-compact unit. The meter is simple to use and offers a big, bright LED display for superior readability in poor lighting conditions.

Complete with four-quadrant power, demand, energy, power factor, and frequency measurements, this versatile unit is easy to wire and mount. It offers an excellent upgrade path that lets you start with a low-cost base model and add enhanced functionality over the long term.

The ION6200 meter lets you upgrade functionality in the field by activating the base unit. Rather than carry a large inventory of pre-configured meters, genset and electrical equipment manufacturers, panel shops, EMS manufacturers and energy service providers can each adapt meter functionality to specific applications as required.

Applications

Class 0.5S metering and sub-metering
Replace multiple analogueue meters
Basic metering
Cost allocation
Substation monitoring

Main characteristics

High visibility front panel display
The ION6200 displays all basic power parameters on a bright LED display with twelve 19 mm high digits.

Megawatt option
The Megawatt option displays all power and energy values in millions (e.g. megawatts) and volts in thousands (kilovolts), using a different front panel faceplate than the standard meter, with labels for kV, MW, MVA, Mvar, MWh, MVAh and Mvarh.

Complete communications
Optional RS 485 port with standard Modbus RTU and ION compatible protocol; data rates from 1,200 bps to 19,200 bps.

Modularity
The ION6200's modular construction allows for simple retrofit, allowing you to save money by making a low initial investment that can be upgraded to meet future needs.

Easy to use
Fast setup via display or software; free configuration software; and a bright, easy to read LED display make the ION6200 easy to use.

Accuracy certification
This meter offers IEC 60687 Class 0.5S accuracy for use as a tariff meter.

Revenue metering option
Provides power and energy measurements that are certified for revenue metering and protection against unauthorized alteration of these measured quantities.

Flexible architecture
Patented ION® technology provides a modular, flexible architecture that offers extensive user programmability. It uniquely addresses complex monitoring and control applications, and adapts to changing needs, avoiding obsolescence.

Multiple installation options
Supports Direct 4-wire Wye, 3-wire Wye, 3-wire Delta, Direct Delta and single phase configurations

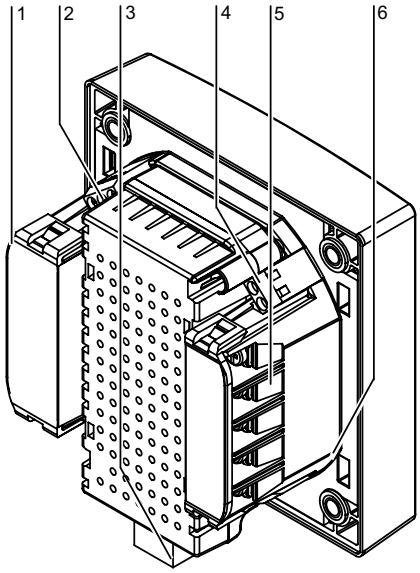
Part numbers

PowerLogic ION6200 meters	
PowerLogic ION6200	**M6200**

See page 56 for part number descriptions and options.

ION6200
Functions and characteristics (cont.)

PE86079



1 *Current inputs*
2 *COM1 port*
3 *Power supply*
4 *D2: Form A digital out*
5 *Voltage inputs*
6 *D1: Form A digital out*

Selection guide		ION6200 Standard	ION6200 EP #1*	ION6200 EP #2*
General		**(N)**	**(P)**	**(R)**
Use on LV and HV systems		■	■	■
Current and voltage accuracy(1)		0.3%	0.3%	0.3%
Energy and power accuracy		0.5%	0.5%	0.5%
Number of samples per cycle		64	64	64
Instantaneous RMS values				
Current and voltage(2)		■	■	■
Frequency		-	■	■
Active power	Total	-	■	■
	per phase	-	-	■
Reactive and apparent power	Total	-	-	■
	per phase	-	-	■
Power factor	Total	-	■	■
	per phase	-	-	■
Energy values				
Active energy(3)		-	■	■
Reactive, apparent energy(3)		-	-	■
Demand values				
Current	Present and max.	-	■	■
Active power	Present	-	-	■
	Max.	-	■	■
Reactive and apparent power	Present and max.	-	-	■
Power quality measurements				
Harmonic distortion(2)	Current, voltage	-	-	■
Display and I/O				
LED display		■	■	■
Pulse output		■	■	■
Direct voltage connection (V ac)		400/690	400/690	400/690
Communication				
RS-485 port		■	■	■
ION compatibility		■	■	■
Modbus RTU protocol		■	■	■

(*) EP = 'Enhanced package.'
(1) For L-N only. L-L = 0.5% reading accuracy.
(2) Some values not available when Volts Mode is set to Delta or Delta Direct.
(3) Additional energy values available on Standard and EP#1 models through pulse output.

ION6200
Functions and characteristics (cont.)

PE86127

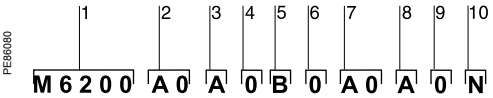
PowerLogic ION6200.

Electrical characteristics			
Type of measurement			True rms electrical parameters Up to 64 samples/cycle
Measurement accuracy	Current	≥ 5% of full scale:	0.3% reading
		< 5% of full scale	0.3% reading + 0.05% full scale
		I4 derivation	0.6% reading + 0.05% full scale
	Voltage		L-N 0.3% reading, L-L 0.5% reading
	Power		IEC 60687 Class 0.5 ANSI 12.20 Class 0.5
	Frequency		0.1% reading
	Power factor		1.0% reading
	Energy		IEC 60687 Class 0.5 ANSI 12.20 Class 0.5
	Harmonic distortion		Total harmonic distortion ± 1.0%
Input-voltage characteristics	Measured voltage(1)		60-400 LN (103.5-690 LL) V ac RMS (3 phase) 60-400 LN V ac (single phase)
	Measurement range		60-400 LN V ac
	Impedance		2 MΩ /phase
	Inputs		V1, V2, V3, Vref
	Overload		1500 V ac RMS continuous
	Dielectric withstand		>3250 V ac RMS; 60 Hz for 1 minute
Input-current characteristics	Rated Inputs(1)		5 A nominal /10 A full scale RMS (+20% overrange with full accuracy, 300 V RMS to ground)
	Permissible overload		120 A RMS for 1 second, non-recurring
	Starting current		0.005 A RMS
	Burden		0.05 VA (typical) @ 5 A RMS
	Inputs		I1, I2, I3
	Dielectric withstand		3000 V RMS for 1 minute
Power supply	AC		Standard: 100-240 V ac, 50-60 Hz 480 V: 480 V ac +/- 5%, 60 Hz
	DC		Standard: 110-300 V dc Low Voltage DC: 20-60 V dc
Input/outputs	Digital outputs		2 optically isolated digital outputs for KY pulsing or control Max forward current: 150 mA Max voltage: 200 V Max current: 150 mA
	RS-485 port		Optically isolated
Mechanical characteristics			
Weight			0.68 kg (shipping)
IP degree of protection (IEC 60529)			Meter with display: front IP 65, back IP 30; Transducer unit (no integrated display): IP 30 Remote display unit: front IP 65; back IP 30
Dimensions			Basic unit installed depth: 106.7x106.7x40.6 mm Remote display: 106.7x106.7x22.9 mm
Environmental conditions			
Operating temperature			-20°C to 70°C ambient air
Storage temperature			-40°C to 85°C
Humidity rating			5% to 95% non-condensing
Pollution degree			2
Installation category			III (Distribution)
Electromagnetic compatibility			
Electrostatic discharge			IEC 61000-4-2 (EN61000-4-2/IEC801-2)
Immunity to radiated fields			IEC 61000-4-3 (EN61000-4-3/IEC801-3)
Immunity to fast transients			IEC 61000-4-4 (EN61000-4-4/IEC801-4)
Surge immunity			IEC 61000-4-5 (EN61000-4-5/IEC801-5)
Conducted immunity			IEC 61000-4-6 (EN61000-4-6/IEC801-6)
Electromagnetic compatibility for industrial environments			IEC 61000-6-2
Safety			
			cUL compliant to CSA C22.2 No. 1010-1
			IEC1010-1 (EN61010-1)
			UL 3111-1
Communications			
RS 485 port			Up to 19 200 bps, Modbus RTU, ION compatible protocol
Display characteristics			
Bright LED display			19 mm high digits Displays all basic power parameters Easy setup for common configuration parameters Password protection on setup parameters Password protection for demand reset

(1) The meter inputs can be used with PTs that have secondaries rated between 50 V ac and 347 V ac +25%. Use CTs that are compliant with the electrical safety code in your region.

ION6200
Functions and characteristics (cont.)

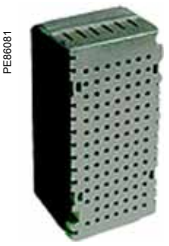
PE86080



Example product part number.

1 *Model.*
2 *Form factor.*
3 *Current inputs.*
4 *Voltage inputs.*
5 *Power supply.*
6 *System frequency.*
7 *Communications.*
8 *Onboard inputs/outputs.*
9 *Security.*
10 *Measurement package.*

PE86081



Part Numbers

Item	Code	Description
1 Model	M6200	ION6200 Meter Kit: ION6200 Meter base, Options Card and Power Supply
2 Form Factor	A0	Integrated display model
	R1	Transducer model with DIN rail mount, Remote Display and 14-ft cable (RJ11, 6 conductor, 26 gauge)
	R2	Transducer model with DIN rail mount, Remote Display and 6-ft cable (RJ11, 6 conductor, 26 gauge)
	R3	Transducer model DIN rail mount, Remote Display and 30-ft cable (RJ11, 6 conductor, 26 gauge)
	T1	Transducer model with DIN rail mount (requires Comms or pulse outputs)
3 Current Inputs	A	10 Amp current inputs (12 Amp max)
4 Voltage Inputs	0	Autoranging (57-400 V ac L-N / 99-690 V ac L-L)
6 System Frequency	0	Calibrated for use with 50 Hz or 60 Hz systems
7 Communications	Z0	No communications
	A0	Single RS-485 port (supports Modbus RTU protocol and ION-compatible PML protocol)
8 I/O	A	No I/O
	B	This option activates the two Form A digital outputs for kWh, kvarh energy pulsing
9 Security	0	No hardware lock (setup is password protected)
	2	RMANSI: Revenue Meter approved for use in the United States (ANSI C12.16 approved; meets ANSI C12.20 class 0.5 accuracy at 23°C; 10A current inputs only)
	3	RMICAN: Measurement Canada approved revenue meter for use in Canada (10A current inputs only)
	4	**RMICAN-SEAL: Factory-sealed and Measurement Canada approved revenue meter
10 Measurement package	N	Standard Measurements (Volts/Amps per phase and avg)
	P	Enhanced Package #1 (Standard Measurements plus Energy/Power total, Frequency, Power Factor total, Neutral Current
	R	Enhanced Package #2 (all measurements)
Power supply		
Power supply	P620PB	Standard plug-in power supply (100-240 V ac / 50-60 Hz or 110-300 V dc)
	P620PC	Low voltage DC plug-in power supply (20-60 V dc)
	P620PD	480V power supply (480 VAC, 60 Hz)

ION6200
Functions and characteristics (cont.)

PE86082

PE86083

MegaWatt options	
MegaWatt option on meter base with integrated display. Not available for RMICAN or RMICAN-sealed meters	**M0**
MegaWatt option on Transducer model with DIN rail mount, Remote Display and 14-ft cable (RJ11, 6 conductor, 26 gauge). Not available with Security options RMICAN or RMICAN-SEAL.	**N1**
MegaWatt option on Transducer model with DIN rail mount, Remote Display and 6-ft cable (RJ11, 6 conductor, 26 gauge). Not available with Security options RMICAN or RMICAN-SEAL.	**N2**
MegaWatt option on Transducer model with DIN rail mount, Remote Display and 30-ft cable (RJ11, 6 conductor, 26 gauge). Not available with Security options RMICAN or RMICAN-SEAL.	**N3**

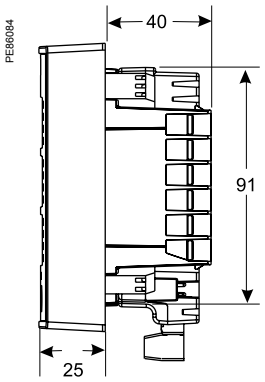
Options card		
1	Standard Measurements	**Z0A0N**
2	Enhanced Package #1	**Z0A0P**
3	Enhanced Package #2	**Z0A0R**
4	Standard Measurements, two pulse outputs	**Z0B0N**
5	Enhanced Package #1, two pulse outputs	**Z0B0P**
6	Enhanced Package #2, two pulse outputs	**Z0B0R**
7	Standard Measurements, RS-485	**A0A0N**
8	Enhanced Package #1, RS-485	**A0A0P**
9	Enhanced Package #2, RS-485	**A0A0R**
10	Standard Measurements, two pulse outputs, RS-485	**A0B0N**
11	Enhanced Package #1, two pulse outputs, RS-485	**A0B0P**
12	Enhanced Package #2, two pulse outputs, RS-485	**A0B0R**

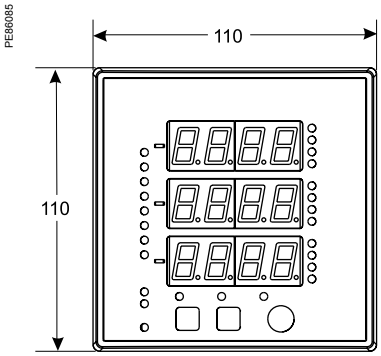
Remote modular display (RMD)		
Model		**M620D**
Display Type	Standard Display	**R**
	MegaWatt option - for use with Transducer meter base with MegaWatt option	**N**
Cable Length	No Cable	**0**
	14-ft cable for connecting Remote Display Unit to the ION6200 Transducer meter base	**1**
	6-ft cable for connecting Remote Display Unit to the ION6200 Transducer meter base	**2**
	30-ft cable for connecting Remote Display Unit to the ION6200 Transducer meter base	**3**

Cables for remote modular display	
14-ft cable for connecting Remote Display Unit to the ION6200 transducer meter base.	**P620C1**
6-ft cable for connecting Remote Display Unit to the ION6200 transducer meter base.	**P620C2**
30-ft cable for connecting Remote Display Unit to the ION6200 transducer meter base.	**P620C3**

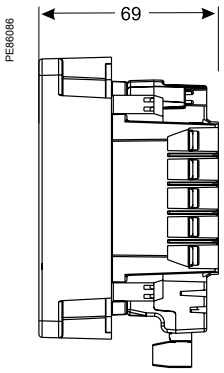
ION6200
Dimensions and connections

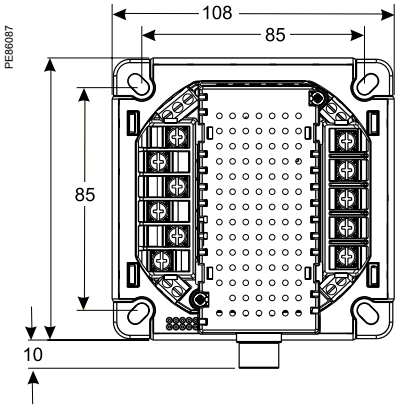
ION6200 integrated model dimensions



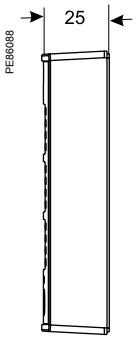


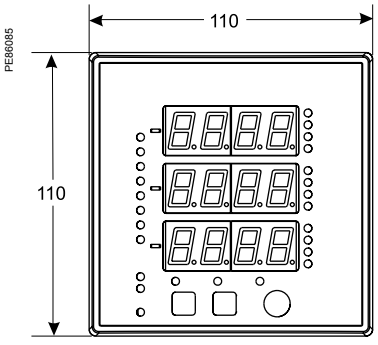
ION6200 TRAN model dimensions





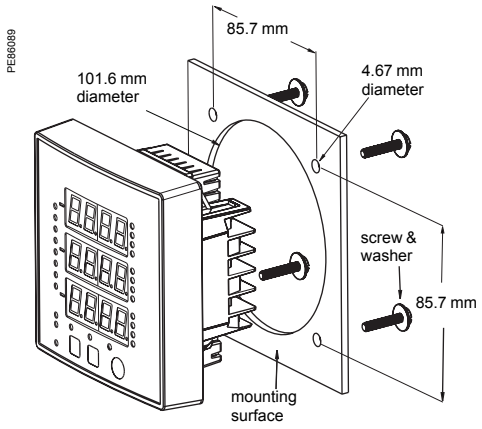
ION6200 RMD dimensions



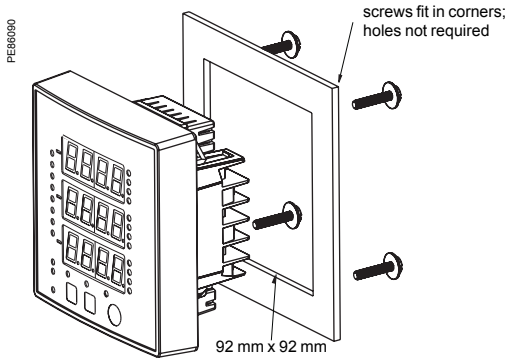


ION6200
Dimensions and connections (cont.)

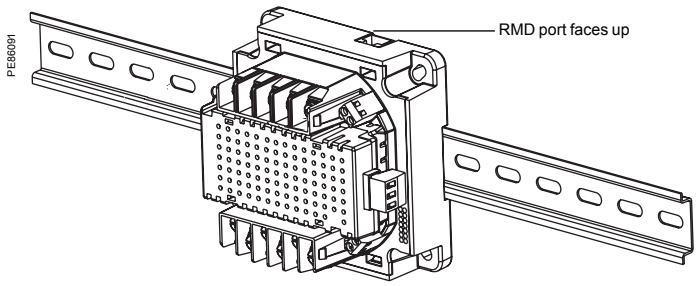
Mounting integrated model - ANSI 4” (4 1/2” Switchboard)



Mounting integrated model - DIN 96



Mounting the TRAN model



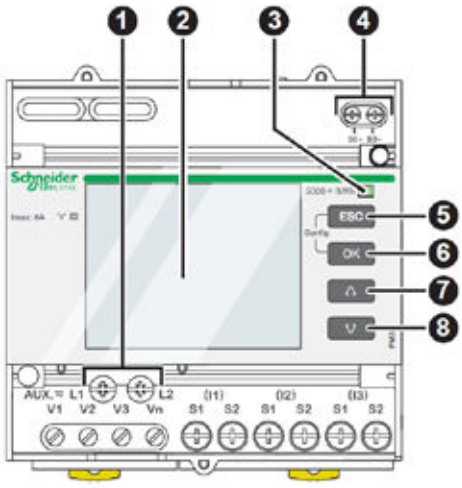
Power Meter Series PM3200
Functions and characteristics

PB108433

Power Meter Series PM3200

PB108435

Power Meter Series PM3255



Front of meter parts
1 Control power
2 Display with white backlit
3 Flashing yellow meter indicator (to check accuracy)
4 Pulse output for remote transfer (PM3210)
5 ESC Cancellation
6 OK Confirmation
7 Up
8 Down

This PowerLogic Power meter offers basic to advanced measurement capabilities. With compact size and DIN rail mounting, the PM3200 allows mains and feeders monitoring in small electrical cabinets. Combined with current transformers and voltage transformers, these meters can monitor 2-, 3- and 4-wire systems. The graphic display has intuitive navigation to easily access important parameters.

Four versions are available offering basic to advanced applications:
- ■ PM3200
  - □ Electrical parameters I, In, U, V, PQS, E, PF, Hz
  - □ Power/current demand
  - □ Min/max.
- ■ PM3210
  - □ Electrical parameters I, In, U, V, PQS, E, PF, Hz, THD
  - □ Power/current demand, peak demand
  - □ Min/max.
  - □ 5 timestamped alarms
  - □ kWh pulse output
- ■ PM3250
  - □ Electrical parameters I, In, U, V, PQS, E, PF, Hz, THD
  - □ Power/current demand, peak demand
  - □ Min/max.
  - □ 5 timestamped alarms
  - □ LED to indicate communications
  - □ RS485 port for Modbus communication
- ■ PM3255
  - □ Electrical parameters I, In, U, V, PQS, E, PF, Hz, THD
  - □ Power/current demand and peak demand
  - □ Min/max. and 15 timestamped alarms
  - □ LED to indicate communications
  - □ Up to 4 tariffs management
  - □ 2 digital inputs, 2 digital outputs
  - □ Memory for load profile (demand 10mn to 60mn)
  - □ RS485 port for Modbus communication

- ■ Innovative design makes the meters smart and simple:
- ■ Easy to install for panel builders
- ■ Easy to commission for contractors and installers
- ■ Easy to operate for end users

Applications

Cost management applications
- ■ Bill checking
- ■ Sub-billing, including WAGES view
- ■ Cost allocation, including WAGES view

Network management applications
- ■ Panel instrumentation
- ■ Up to 15 onboard timestamped alarms to monitor events
- ■ Easy integration with PLC system by input/output interface

Market segments
- ■ Buildings
- ■ Industry
- ■ Data centres and networks
- ■ Infrastructure (airports, road tunnels, telecom)

Part numbers

Meter model and description	Performance	Part no.
PM3200 basic power meter	Basic power meter	**METSEPM3200**
PM3210 power meter with pulse output	Power, current, THD, peak demand	**METSEPM3210**
PM3250 power meter with RS485 port	Power, current, THD, peak demand	**METSEPM3250**
PM3255 power meter plus 2 digital inputs, 2 digital outputs with RS485 port	Power, current, THD, peak demand, memory for load profile	**METSEPM3255**

Power Meter Series PM3200
Functions and characteristics (cont.)

Function guide		PM3200 Range			
		PM3200	PM3210	PM3250	PM3255
Performance standard					
IEC61557-12 PMD/Sx/K55/0.5		■	■	■	■
General					
Use on LV and HV systems		■	■	■	■
Number of samples per cycle		32	32	32	32
CT input 1A/5A		■	■	■	■
VT input		■	■	■	■
Multi-tariff		4	4	4	4
Multi-lingual backlit display		■	■	■	■
Instantaneous rms values					
Current, voltage	Per phase and average	■	■	■	■
Active, reactive, apparent power	Total and per phase	■	■	■	■
Power factor	Total and per phase	■	■	■	■
Energy values					
Active, reactive and apparent energy; import and export		■	■	■	■
Demand value					
Current, power (active, reactive, apparent) demand; present		■	■	■	■
Current, power (active, reactive, apparent) demand; peak			■	■	■
Power quality measurements					
THD Current and voltage			■	■	■
Data recording					
Min/max of the instantaneous values		■	■	■	■
Power demand logs					■
Energy consumption log (day, week, month)					■
Alarms with time stamping			5	5	15
Digital inputs/digital outputs			0/1		2/2
Communication					
RS-485 port				■	■
Modbus protocol				■	■

PB109434

Power Meter Series PM3210

Connectivity advantages	
Programmable digital input	External tariff control signal (4 tariffs) Remote Reset partial counter External status like breaker status Collect WAGES pulses
Programmable digital output	Alarm (PM3255) kWh pulses
Graphic LCD display	Backlit graphic display allows smart navigation in relevant information and in multi languages
Communication	Modbus RS485 with screw terminals allows connection to a daisy chain

Power Meter Series PM3200
Functions and characteristics (cont.)

Specifications	PM3200 Range
Type of measurement	True rms up to the 15th harmonic on three-phase (3P,3P+N) and single-phase AC systems. 32 samples per cycle
Measurement accuracy	
Current with x/5A CTs	0.3% from 0.5A to 6A
Current with x/1A CTs	0.5% from 0.1A to 1.2A
Voltage	0.3% from 50V to 330V (Ph-N), from 80V to 570V (Ph-Ph)
Power factor	±0.005 from 0.5A to 6A with x/5A CTs; from 0.1A to 1.2A with x/1A CTs and from 0.5L to 0.8C
Active/Apparent Power with x/5A CTs	Class 0.5
Active/Apparent Power with x/1A CTs	Class 1
Reactive power	Class 2
Frequency	0.05% from 45 to 65Hz
Active energy with x/5A CTs	IEC62053-22 Class 0.5s
Active energy with x/1A CTs	IEC62053-21 Class 1
Reactive energy	IEC62053-23 Class 2
Data update rate	
Update rate	1s
Input-voltage characteristics	
Measured voltage	50V to 330V AC (direct / VT secondary Ph-N) 80V to 570V AC (direct / VT secondary Ph-Ph) up to 1MV AC (with external VT)
Frequency range	45Hz to 65Hz
Input-current characteristics	
CT primary	Adjustable from 1A to 32767A
CT secondary	1A or 5A
Measurement input range with x/5A CTs	0.05A to 6A
Measurement input range with x/1A CTs	0.02A to 1.2A
Permissible overload	10A continuous, 20A for 10s/hour
Control Power	
AC	100/173 to 277/480V AC (+/-20%), 3W/5VA; 45Hz to 65Hz
DC	100 to 300V DC, 3W
Input	
Digital inputs (PM3255)	11 to 40V DC, 24V DC nominal, <=4mA maximum burden, 3.5kVrms insulation
Output	
Digital output (PM3210)	Optocoupler, polarity sensitive, 5 to 30V, 15mA max, 3.5kVrms insulation
Digital outputs (PM3255)	Solid state relay, polarity insensitive, 5 to 40V, 50mA max, 50Ω max, 3.5kVrms insulation

Power Meter Series PM3200
Functions and characteristics (cont.)

Specifications (continued)	PM3200 Range
Mechanical characteristics	
Weight	0.26kg
IP degree of protection (IEC60529)	IP40 front panel, IP20 meter body
Dimension	90 x 95 x 70mm
Environmental conditions	
Operating temperature	-25 °C to +55 °C
Storage temperature	-40 °C to +85 °C
Humidity rating	5 to 95% RH at 50°C (non-condensing)
Pullution degree	2
Metering category	III, for distribution systems up to 277/480VAC
Dielectric withstand	As per IEC61010-1, Doubled insulated front panel display
Altitude	3000m max
Electromagnetic compatibility	
Electrostatic discharge	Level IV (IEC61000-4-2)
Immunity to radiated fields	Level III (IEC61000-4-3)
Immunity to fast transients	Level IV (IEC61000-4-4)
Immunity to surge	Level IV (IEC61000-4-5)
Conducted immunity	Level III (IEC61000-4-6)
Immunity to power frequency magnetic fields	0.5mT (IEC61000-4-8)
Conducted and radiated emissions	Class B (EN55022)
Safety	
	CE as per IEC61010-1 (1)
Communication	
RS485 port	Half duplex, from 9600 up to 38400 bauds, Modbus RTU (double insulation)
Display characteristics	
Dimensions (VA)	43mm x 34.6mm
Display resolution	128 x 96 dots
Standard compliance	
	IEC61557-12, EN61557-12 IEC61010-1, UL61010-1 IEC62052-11, IEC62053-21, IEC62053-22, IEC62053-23 EN50470-1, EN50470-3

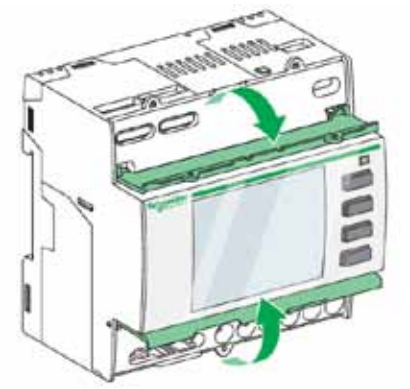
(1) Protected throughout by double insulation

Power Meter Series PM3250

Multi-tariff capability
The PM3200 range allows arrangement of kWh consumption in four different registers. This can be controlled by:
- Digital Inputs. Signal can be provided by PLC or utilities
- Internal clock programmable by HMI
- Through communication

This function allows users to:
- Make tenant metering for dual source applications to differentiate backup source or utility source
- Understand well the consumption during working time and non working time, and between working days and weekends
- Follow up feeders consumption in line with utility tariff rates

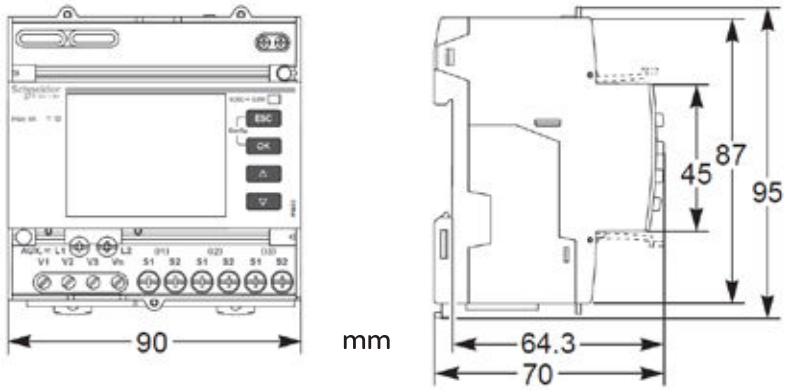
Power Meter Series PM3200
Dimensions and connection



PM3200 top and lower flaps

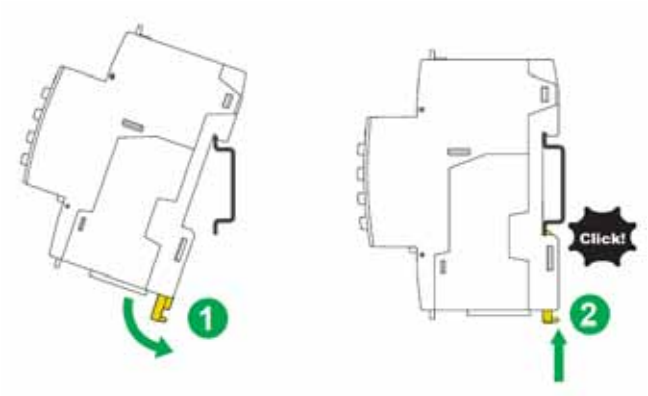
PM3200 series dimensions

PB105302



PM3200 series easy installation

PB105446



PM5350
Functions and characteristics

PE86278

PowerLogic PM5350.

The PowerLogic PM5350 power meter offers all the measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit extending only 44 mm behind the mounting surface.

With its large display, all three phases and neutral can be monitored simultaneously. The bright, anti-glare display features large characters and powerful backlighting for easy reading even in extreme lighting conditions and viewing angles. The meter menus are understood by all, with the availability of two languages (English/Chinese) included standard in the PM5350.

Its compact size and high performance make the PowerLogic PM5350 suitable for many applications.

Applications
Panel instrumentation.
Cost allocation or energy management.
Electrical installation remote monitoring.
Alarming with under/over, digital status, control power failure, meter reset, self diagnostic issue.
Circuit Breaker monitoring and control with relay outputs and whetted digital inputs.

Main characteristics

Easy to install
Mounts using two clips, no tools required. Ultra compact meter with 44mm depth connectable up to 480 VL-L without voltage transformers for installations compliant with category III, as per IEC 61010-1. See specification table for UL voltage limits.

Easy to operate
Intuitive navigation with self-guided, language selectable menus, six lines, four concurrent values. Two LEDs on the meter face help the user confirm normal operation (heartbeat/communications indicator LED: green and other LED orange, customizable either for alarms or energy pulse outputs).

Easy circuit breaker monitoring and control
The PM5350 provides two relay outputs (high performance) with capability to command most of the circuit breaker coils directly. In addition, monitored switches can be wired directly to the meter without external power supply.

System status at a glance
Bright, anti-glare, backlit display plus two LEDs; orange for energy pulse or alarm and green for heartbeat/communications indication.

IEC 62053-22 class 0.5S accuracy for active energy
Accurate energy measurement for cost allocation.

Power Quality analysis
The PM5350 offers THD and TDD measurements as standard. Total Demand Distortion is based on a point of common coupling (PCC), which is a common point that each user receives power from the power source. The TDD compares the contribution of harmonics versus the maximum demand load.

Load management
Peak demands with time stamping are provided. Predicted demand values can be used in basic load shedding applications.

Alarming with time stamping
Over 30 alarm conditions, such as under/over conditions, digital input changes, and phase unbalance inform you of events. A time-stamped log maintains a record of the last 40 alarm events.

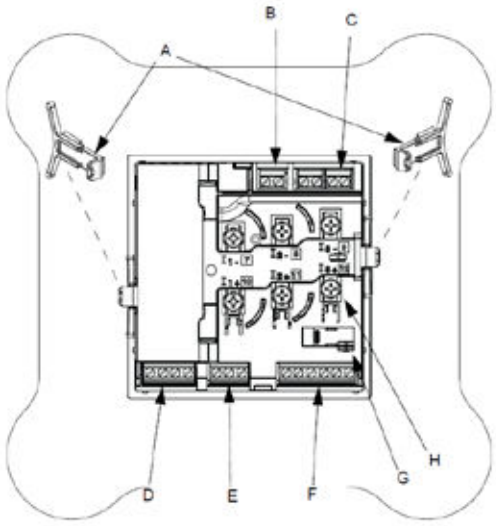
Load timer
Load timer setpoint adjustable to monitor and advise maintenance requirements.

Performance Standard Meets IEC 61557-12 PMD/S/K70/0.5.

PM5350
Functions and characteristics (cont.)

PE86323

PE86324



PM5350 meter parts

A Retainer clips.
B Control power supply connector.
C Voltage inputs.
D Digital outputs.
E Rs485 port (COM1).
F Digital outputs.
G Optical revenue switch.
H Current inputs.

General			
Use on LV and MV systems		■	
Basic metering with THD and min/max readings		■	
Instantaneous rms values			
Current	Total, Phases and neutral	■	
Voltage	Total, Ph-Ph and Ph-N	■	
Frequency		■	
Real, reactive, and apparent power	Total and per phase	Signed	
True Power Factor	Total and per phase	Signed, Four Quadrant	
Displacement PF	Total and per phase	Signed, Four Quadrant	
Unbalanced I, VL-N, VL-L		■	
Energy values			**Stored in non-volatile memory**
Accumulated Active, Reactive and Apparent Energy		Received/Delivered; Net and absolute;	■
Demand values			
Current average		Present, Last, Predicted, Peak, & Peak Date Time	■
Active power		Present, Last, Predicted, Peak, & Peak Date Time	■
Reactive power		Present, Last, Predicted, Peak, & Peak Date Time	■
Apparent power		Present, Last, Predicted, Peak, & Peak Date Time	■
Peak demand with timestamping D/T for current & powers		■	■
Demand calculation	Sliding, fixed and rolling block, thermal	■	■
Synchronization of the measurement window		■	■
Other measurements			
I/O timer		■	■
Operating timer		■	■
Active load timer		■	■
Alarm counters		■	■
Power quality measurements			
THD, thd (Total Harmonic Distortion)		I,VLN, VLL	
TDD, thd (Total Demand Distortion)		■	
Data recording			
Min/max of instantaneous values, plus phase identification		■	■
Alarms with 1s timestamping		Standard 29; Unary 4; Digital 4	
Alarms stored in non-volatile memory		40 events	■
Inputs/Outputs			
Digital inputs		4 (DI1, DI2, DI3, DI4)	
Digital outputs		2 relay outputs (DO1, DO2)	
Display			
White backlit LCD display, 6 lines, 4 concurrent values		■	
IEC or IEEE visualization mode		■	
Communication			
Modbus RTU, Modbus ASCII, Jbus Protocol		■	
Firmware update via RS485 serial port (DLF3000 via the Schneider Electric website: www.schneider-electric.com)		■	

PM5350
Functions and characteristics (cont.)

PE86292

Front screen view of PM5350.

Electrical characteristics

Type of measurement			True rms up to the 15th harmonic on three-phase (3P, 3P + N) 32 samples per cycle, zero blind
Measurement accuracy	Current, Phase (1)		±0.30%
	Voltage, L-N (1)		±0.30%
	Power Factor (1)		±0.005
	Power, Phase		IEC 61557-12 Class 0.5; For 5 A nominal CT (for 1 A nominal CT when I > 0.15A) ±0.5% from 0.25 A to 9.0 A at COS φ = 1 ±0.6% from 0.50 A to 9.0 A at COS φ = 0.5 (ind or cap)
	Frequency (1)		±0.05%
	Real Energy		IEC 62053-22 Class 0.5S; IEC 61557-12 Class 0.5; For 5 A nominal CT (for 1 A nominal CT when I > 0.15A) ±0.5% from 0.25 A to 9.0 A at COS φ = 1 ±0.6% from 0.50 A to 9.0 A at COS φ = 0.5 (ind or cap) IEC 61557-12 Class 0.5
	Reactive Energy		IEC 62053-23 Class 3, IEC 61557-12 Class 2 For 5 A nominal CT (for 1 A nominal CT when I > 0.15A) ±2.0% from 0.25 A to 9.0 A at SIN φ = 1 ±2.5% from 0.50 A to 9.0 A at SIN φ = 0.5 (ind or cap)
Data update rate			1 second nominal (50/60 cycles)
Input-voltage	VT primary		1.0 MV AC max, starting voltage depends on VT ratio.
	U_{nom}		277 V L-N
	Measured voltage with overrange & Crest Factor		IEC: 20 to 690 V AC L-L; 20 to 400 V AC L-N UL: 20 to 300 V AC L-L
	Permanent overload		700 Vac L-L, 404 Vac L-N
	Impedance		10 M Ω
	Frequency range		45 to 70 Hz
Input-current	CT ratings	Primary	Adjustable 1 A to 32767 A
		Secondary	1A, 5 A nominal
	Measured voltage with overrange & Crest Factor		5 mA to 9 A
	Withstand		Continuous 20 A,10 sec/hr 50 A,1 sec/hr 500 A
	Impedance		< 0.3 mΩ
	Frequency range		45 to 70 Hz
	Burden		< 0.024 VA at 9 A
AC control power	Operating range		85 - 265 V AC
	Burden		4.1 VA / 1.5 W typical, 6.7 VA / 2.7 W max at 120 V AC 6.3 VA / 2.0 W typical, 8.6 VA / 2.9 W max at 230 V AC 9.6 VA / 3.5 W maximum at 265 V AC
	Frequency		45 to 65 Hz
	Ride-through time		100 mS typical at 120 V AC and maximum burden 400 mS typical at 230 V AC and maximum burden
DC control power	Operating range		100 to 300 V DC
	Burden		1.4 W typical, 2.6 W maximum at 125 V DC 1.8 W typical, 2.7 W maximum at 250 V DC 3.2 W maximum at 300 V DC
	Ride-through time		50 mS typical at 125 V DC and maximum burden
Real time clock	Ride-through time		30 seconds
Digital output	Number/Type		2 - Mechanical Relays
	Output frequency		0.5 Hz maximum (1 second ON / 1 second OFF - minimum times)
	Switching Current		250 V AC at 2.0 Amps, 200 k cycles, resistive 250 V AC at 8.0 Amps, 25 k cycles, resistive 250 V AC at 2.0 Amps, 100 k cycles, COSΦ=0.4 250 V AC at 6.0 Amps, 25 k cycles, COSΦ=0.4 30 V DC at 2.0 Amps, 75 k cycles, resistive 30 V DC at 5.0 Amps, 12.5 k cycles, resistive
	Isolation		2.5 kVrms
Status Digital Inputs	Voltage ratings		ON 18.5 to 36 V DC, OFF 0 to 4 V DC
	Input Resistance		110 k Ω
	Maximum Frequency		2 Hz (T ON min = T OFF min = 250 ms)
	Response Time		10 ms
	Isolation		2.5 kVrms
Whetting output	Nominal voltage		24 V DC
	Allowable load		4 mA
	Isolation		2.5 kVrms

***(1)** Measurements taken from 45 Hz to 65 Hz, 0.5 A to 9 A, 57 V to 347 V & 0.5 ind to 0.5 cap power factor with a sinusoidal wave.*

PM5350
Functions and characteristics (cont.)

Mechanical characteristics		
Weight		250 g
IP degree of protection (IEC 60529)		IP51 front display, IP30 meter body
Dimensions	W x H x D	96 x 96 x 44 mm (depth of meter from housing mounting flange) 96 x 96 x 13 mm (protrusion of meter from housing flange)
Mounting position		Vertical
Panel thickness		6.35 mm maximum
Environmental characteristics		
Operating temperature	Meter	-25 °C to 70 °C
	Display	-20 °C to +70 °C (Display functions to -25°C with reduced performance)
Storage temp.	Meter + display	-40 °C to +85 °C
Humidity rating		5 to 95 % RH at 50 °C (non-condensing)
Pollution degree		2
Altitude		3000 m max.
Electromagnetic compatibility		
Electrostatic discharge		IEC 61000-4-2(2)
Immunity to radiated fields		IEC 61000-4-3(2)
Immunity to fast transients		IEC 61000-4-4(2)
Immunity to impulse waves		IEC 61000-4-5(2)
Conducted immunity		IEC 61000-4-6(2)
Immunity to magnetic fields		IEC 61000-4-8(2)
Immunity to voltage dips		IEC 61000-4-11(2)
Radiated emissions		FCC part 15 class A, EN 55011 Class A
Conducted emissions		FCC part 15 class A, EN 55011 Class A
Harmonics		IEC 61000-3-2(2)
Flicker emissions		IEC 61000-3-3(2)
Safety		
Europe		CE, as per IEC 61010-1
U.S. and Canada		cULus as per UL61010-1, IEC 61010-1 (2nd Edition)
Measurement category (Voltage and current inputs)		Per IEC 61010-1: CAT III, 277 V L-N / 480 V L-L (1) nominal; CAT II 400 V L-N / 690 V L-L (1) nominal Per UL 61010-1 and CSA C22.2 No. 61010-1: CAT III, 300 V L-L
Overvoltage Category (Control power)		CAT III
Dielectric		As per IEC 61010-1 Double insulated front panel display
Protective Class		II
Communication		
RS 485 port		2-Wire, 9600,19200 or 38400 baud, Parity - Even, Odd, None, 1 stop bit if parity Odd or Even, 2 stop bits if None; Modbus RTU, Modbus ASCII (7 or 8 bit), JBUS
Firmware and language file update		Update via comunication port using DLF3000 software
Isolation		2.5 kVrms, double insulated
Human machine interface		
Display type		Monochrome Graphics LCD
Resolution		128 x 128
Backlight		White LED
Viewable area (W x H)		67 x 62.5 mm
Keypad		4-button
Indicator Heartbeat / Comm activity		Green LED
Energy pulse output / Active alarm indication (configurable)		
Type		Optical, amber LED
Wavelength		590 to 635 nm
Maximum pulse rate		2.5 kHz

(1) V L-L is limited to 700 V AC
(2) As per IEC 61557-12

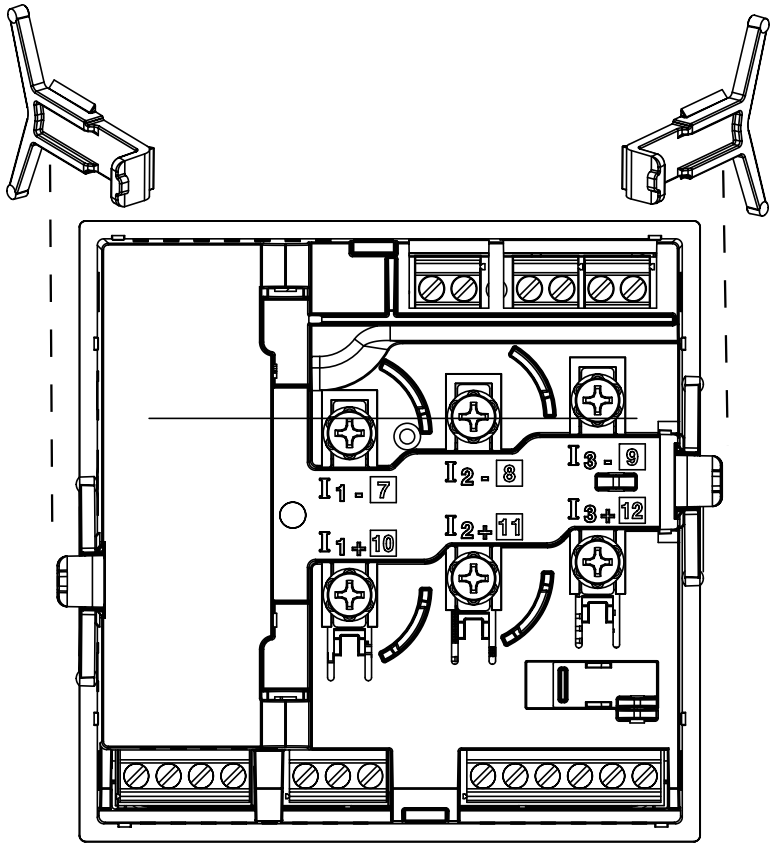
PM5350 Power Meter
Dimensions and connection

Rear of meter - open

PE86279

Rear view retainers - installation

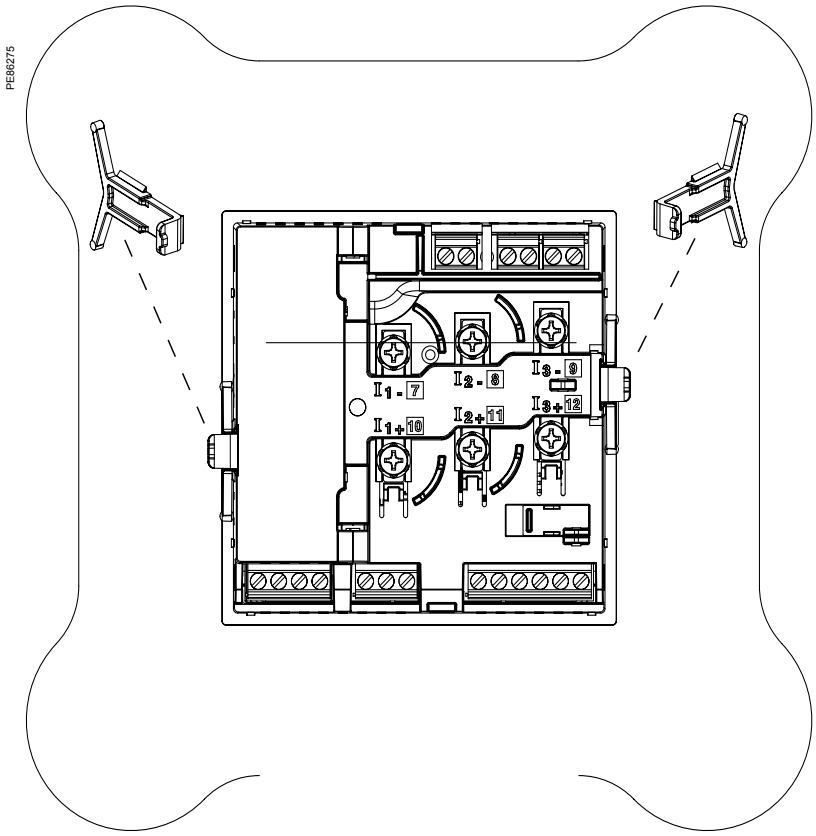
PE86274



For detailed installation instructions see the product's Installation guide.

PM5350 Power Meter
Dimensions and connection (cont.)

Rear view retainers - users



For detailed installation instructions see the product's Installation guide.

PM5000 Series
Functions and characteristics

PB111776

PowerLogic™ PM5000 Series meter

PowerLogic™ PM5100, PM5300 and PM5500 series

The PowerLogic™ PM5000 power meter is the ideal fit for cost management applications. It provides the measurement capabilities needed to allocate energy usage, perform tenant metering and sub-billing, pin-point energy savings, optimize equipment efficiency and utilization, and perform a high level assessment of the power quality of the electrical network.
In a single 96 x 96 mm unit, with a graphical display, all three phases, neutral and ground can be monitored simultaneously.
The bright, anti-glare display features large characters and powerful backlighting for easy reading even in extreme lighting conditions and viewing angles.
Easy to understand menus, text in 8 selectable languages, icons and graphics create a friendly environment to learn about your electrical network.
Highly accurate devices with global billing certifications.

Applications

Cost management: Cost saving opportunities becomes clear once you understand how and when your facility uses electricity. These meters are ideal for:
■ **Sub billing / tenant metering:** allows a landlord, property management firm, condominium association, homeowners association, or other multi-tenant property to bill tenants for individual measured utility (electricity) usage. MID approved meters for billing applications across Europe.
■ **Cost allocation:** allocate energy costs between different departments (HVAC, indoor and outdoor lighting, refrigeration, etc), different parts of an industrial process or different cost centres. Cost allocation systems can help you save money by making changes to your operation, better maintaining your equipment, taking advantage of pricing fluctuations, and managing your demand.

Network management: Improving reliability of the electrical network is key for success in any business. Monitoring values such as voltage levels, harmonic distortion and voltage unbalance will help you to ensure proper operation and maintenance of your electrical network and equipment. PowerLogic™ PM5000 series meters are the perfect tool for:
■ **Basic Power Quality monitoring:** power quality phenomena can cause undesirable effects such as heating in transformers, capacitors, motors, generators and misoperation of electronic equipment and protection devices.
■ **Min/ Max monitoring (with timestamp):** understanding when electrical parameters, such as voltage, current and power demand, reach maximum and minimum values will give you the insight to correctly maintain your electrical network and assure equipment will not be damaged.
■ **Alarming:** alarms help you to be aware of any abnormal behavior on the electrical network in the moment it happens.
■ **WAGES monitoring:** take advantage of the input metering on PM5000 meters to integrate measurements from 3rd party devices such as water, air, gas, electricity or steam, meters.

Main characteristics

Easy to install
Mounts using two clips, in standard cut out for DIN 96 x 96mm, no tools required.
Compact meter with 72mm (77mm for PM5500) depth connectable up to 690 VL-L without voltage transformers for installations compliant with category III.

Easy to operate
Intuitive navigation with self-guided, language selectable menus, six lines, four concurrent values. Two LEDs on the meter face help the user confirm normal operation with a green LED - heartbeat/communications indicator, and the amber LED - customizable either for alarms or energy pulse outputs.

Easy circuit breaker monitoring and control
The PM5300 provides two relay outputs (high performance Form A type) with capability to command most of the circuit breaker coils directly. For Digital Inputs, monitored switches can be wired directly to the meter without external power supply. PM5500 series have 4 status inputs (digital) and 2 digital output (solid state) to use for WAGES monitoring, control and alarm annunciation.

Commercial reference numbers	
PM5100	METSEPM5100
PM5110	METSEPM5110
PM5111	METSEPM5111
PM5310	METSEPM5310
PM5320	METSEPM5320
PM5330	METSEPM5330
PM5331	METSEPM5331
PM5340	METSEPM5340
PM5341	METSEPM5341
PM5560	METSEPM5560
PM5561	METSEPM5561
PM5563	METSEPM5563

Accurate energy measurement for precise cost allocation:

	PM5100	PM5300	PM5500
IEC 62053-22 (Active Energy)	Class 0.5S	Class 0.5S	Class 0.2S
IEC 62053-24 (Reactive Energy)	Class 2	Class 2	Class 1

PM5000 Series
Functions and characteristics (cont.)

PowerLogic™ PM5500 meter

PowerLogic™ PM5300 meter

PowerLogic™ PM5100 meter

MID Certified according to MID Directive, Annex "B" + Annex "D" for legal metrology relevant to active electrical energy meters (see Annex MI-003 of MID). Can be used for fiscal (legal) metrology.

Direct metering of neutral current
The PM5500 has a fourth CT for measuring neutral current. In demanding IT applications, where loads are non-linear (i.e. switching power supplies on computers/ servers), measuring neutral current is essential to avoid overload and resulting outage. In addition, the PM5500 provides a calculated ground current value, not available in meters with 3 CTs.

Power Quality analysis
The PM5000 offers Total Harmonic Distortion (THD/thd), Total Demand Distortion (TDD) measurements and individual harmonics (odd) magnitudes and angles for voltage and current:

	PM5100	PM5300	PM5500
Individual Harmonics	magnitudes up to 15th	magnitudes up to 31st	magnitudes & angles up to 63rd

These types of power quality parameters help to identify the source of harmonics that can harm transformers, capacitors, generators, motors and electronic equipment.

Load management
Peak demands with time stamping are provided. Predicted demand values can be used in combination with alarms for basic load shedding applications.

Alarming with time stamping
A different combination of set point driven alarms and digital alarms with 1s time stamping are available in the PM5000 family:

	PM5100	PM5300	PM5500
Set point driven alarms	**29**	**29**	**29**
Unary	**4**	**4**	**4**
Digital	**2**	**2**	**4**
Boolean / Logic	**–**	**–**	**10**
Custom defined	**–**	**–**	**5**

Alarms can be visualized as Active (the ones that have picked up and did not drop out yet) or Historical (the ones that happened in the past).
Alarms can be programmed and combined to trigger digital outputs and mechanical relays (PM5300).
The PM5000 series keeps an alarm log with the active and historical alarms with date and time stamping.

Load timer
A load timer can be set to count load running hours based on a minimum current withdraw, adjustable to monitor and advise maintenance requirements on the load.

High Performance and accuracy
IEC 61557-12 Performance measuring and monitoring devices (PMD)
Defines the performance expectation based on classes. It defines the allowable error in the class for real and reactive power and energy, frequency, current, voltage, power factor, voltage unbalance, voltage and current harmonics (odds), voltage THD, current THD, as well as ratings for temperature, relative humidity, altitude, start-up current and safety. It makes compliant meters readings comparable - they will measure the same values when connected to the same load.

Meets IEC 61557-12 PMD/S/K70/0.5 for PM5100 and PM5300

Meets IEC 61557-12 PMD/S/K70/0.2 for PM5500

Legal billing compliance
MID compliance is compulsory for billing applications across Europe.
In addition to billing applications, for facility managers responsible for energy cost MID means same level of quality as a billing meter.

MID ready compliance, EN50470-1/3 – Class C

PM5000 Series
Functions and characteristics (cont.)

General		PM5100	PM5300	PM5500
Use on LV and MV systems			■	
Basic metering with THD and min/max readings			■	
Instantaneous rms values				
Current	per phase, neutral and ground (PM5500)		■	
Voltage	Total, per phase L-L and L-N		■	
Frequency			■	
Real, reactive, and apparent power	Total and per phase		Signed, Four Quadrant	
True Power Factor	Total and per phase		Signed, Four Quadrant	
Displacement PF	Total and per phase		Signed, Four Quadrant	
% Unbalanced I, VL-N, VL-L			■	
Direct monitoring of neutral current				■
Energy values*				
Accumulated Active, Reactive and Apparent Energy			Received/Delivered; Net and absolute; Time Counters	
Demand values*				
Current average			Present, Last, Predicted, Peak, and Peak Date Time	
Active power			Present, Last, Predicted, Peak, and Peak Date Time	
Reactive power			Present, Last, Predicted, Peak, and Peak Date Time	
Apparent power			Present, Last, Predicted, Peak, and Peak Date Time	
Peak demand with time stamping D/T for current and powers			■	
Demand calculation	Sliding, fixed and rolling block, thermal methods		■	
Synchronization of the measurement window to input, communication command or internal clock			■	
Settable Demand intervals			■	
Demand calculation for Pulse input (WAGES)				■
Other measurements*				
I/O timer			■	
Operating timer			■	
Load timer			■	
Alarm counters and alarm logs			■	
Power quality measurements				
THD, thd (Total Harmonic Distortion) I, VLN, VLL per phase			I,VLN, VLL	
TDD (Total Demand Distortion)			■	
Individual harmonics (odds)		15th	31st	63rd
Neutral Current metering with ground current calculation				■
Data recording				
Min/max of instantaneous values, plus phase identification*			■	
Alarms with 1s timestamping*			■	
Data logging			2 fixed parameters kWh and kVAh with configurable interval and duration (e.g. 2 parameters for 60 days at 15 minutes interval)	Up to 14 selectable parameters with configurable interval and duration (e.g. 6 parameters for 90 days at 15 minutes interval)
Memory capacity			256 kB	1.1 MB
Min/max log		■	■	■
Maintenance, alarm and event logs			■	■
Customizable data logs				■
Inputs/Outputs/Relays				
Digital inputs			2 (SI1, SI2)	4 (SI1, SI2, SI3, SI4) with WAGES support
Digital outputs		1 (kWh only)	2 (configurable)	
Form A Relay outputs			2	
Timestamp resolution in seconds			1	
Whetting voltage			■	

**Stored in non-volatile memory*

PM5000 Series
Functions and characteristics (cont.)

Electrical characteristics*			PM5100	PM5300	PM5500
Type of measurement: True rms on three-phase (3P, 3P + N), zero blind			64 samples per cycle		128 samples per cycle
Measurement accuracy	IEC 61557-12		PMD/S/K70/0.5		PMD/[SD|SS]/K70/0.2
	IEC 62053-22 Active Energy		Class 0.5S		Class 0.2S
	IEC 62053-24 Reactive Energy		Class 2S		Class 1S
	Active Energy		±0.5%		±0.2%
	Reactive Energy		±2%		±1%
	Active Power		Class 0.5 as per IEC 61557-12		Class 0.2 as per IEC 61557-12
	Apparent Power		Class 0.5 as per IEC 61557-12		
	Current, Phase		Class 0.5 as per IEC 61557-12		±0.15%
	Voltage, L-N		Class 0.5 as per IEC 61557-12		±0.1%
	Frequency		±0.05%		
	MID Directive EN50470-1, EN50470-3		Annex B and Annex D (Optional model references) Class C		
Input-voltage (up to 1.0 MV AC max, with voltage transformer)	Nominal Measured Voltage range		20 V L-N / 35 V L-L to 400 V L-N /690 V L-L absolute range 35 V L-L to 760 V L-L		20 V L-N / 20 V L-L to 400 V L-N /690 V L-L absolute range 20 V L-L to 828 V L-L
	Impedance		5 MΩ		
	F nom		50 or 60 Hz ±5%		50 or 60 Hz ±10%
Input-current (configurable for 1 or 5 A secondary CTs)	I nom		5 A		
	Measured Amps with over range and Crest Factor		5 mA to 8.5 A		Starting current: 5m A Operating range: 50 mA to 10 A
	Withstand		Continuous 20 A,10 sec/hr 50 A		
	Impedance		< 0.3 mΩ		
	F nom		50 or 60 Hz ±5%		50 or 60 Hz ±10%
	Burden		< 0.024 VA at 10 A		
AC control power	Operating range		100- 415 V AC L-L ±10% CAT III 300V class per IEC 61010		100-480 V AC ±10% CAT III 600V class per IEC 61010
	Burden		<5 W,11 VA at 415V L-L		<5W/16.0 VA at 480 V AC
	Frequency		45 to 65 Hz		
	Ride-through time		80 mS typical at 120V AC and maximum burden. 100 mS typical at 230 V AC and maximum burden 100 mS typical at 415 V AC and maximum burden		35 ms typical at 120 V L-N and maximum burden 129 ms typical at 230 V L-N and maximum burden
DC control power	Operating range		125-250 V DC ±20%		
	Burden		<4 W at 250 V DC		typical 3.1W at 125 V DC, max. 5W
	Ride-through time		50 mS typical at 125 V DC and maximum burden		
Outputs	Mechanical	Max output frequency		0.5 Hz maximum (1 second ON / 1 second OFF - minimum times)	
		Switching current		250 V AC at 8.0 Amps, 25 k cycles, resistive 30 V DC at 2.0 Amps, 75 k cycles, resistive 30 V DC at 5.0 Amps, 12.5 k cycles, resistive	
		Isolation		2.5 kV rms	
	Digital outputs		1	2	2
		Max load voltage	40 V DC (AC not available)		30 V AC / 60 V DC
		Max load current	20 mA		125 mA
		On Resistance	50 Ω max		8 Ω
		Meter constant	from 1 to 9,999,999 pulses per kWh		
		Pulse width for Digital Output	50% duty cycle		
		Pulse frequency for Digital Output	25 Hz max.		
		Leakage current	0.03 micro Amps		1 micro Amps
		Isolation	5 kV rms		2.5 kV rms
	Optical outputs				
		Pulse width (LED)	200 ms		
		Pulse frequency	50 Hz. max.		2.5 kHz. max
		Meter constant	from 1 to 9,999,999 pulses per k_h		

PM5000 Series
Functions and characteristics (cont.)

Electrical characteristics* (cont'd)		PM5100	PM5300	PM5500
Status Inputs	ON Voltage		18.5 to 38 V DC	30 V AC / 60 V DC max
	OFF Voltage		0 to 4 V DC	
	Input Resistance		110 k Ω	100 k Ω
	Maximum Frequency		2 Hz (T ON min = T OFF min = 250 ms)	25 Hz (T ON min = T OFF min = 20 ms)
	Response Time		20 ms	10 ms
	Opto Isolation		5 kV rms	2.5 kV rms
	Whetting output		24 V DC/ 8mA max	
	Input Burden		2 mA @ 24 V AC/DC	
Mechanical characteristics				
Weight		380 g	430 g	450 g
IP degree of protection (IEC 60529)		IP52 front display, IP30 meter body		
Dimensions W x H x D [protrusion from cabinet]		96 x 96 x 72mm (77mm for PM5500) (depth of meter from housing mounting flange) [13mm]		
Mounting position		Vertical		
Panel thickness		6 mm maximum		
Environmental characteristics				
Operating temperature	Meter	-25 °C to 70 °C		
	Display (Display functions to -25° with reduced performance)	-25 °C to +70 °C		
Storage temp.		-40 °C to +85 °C		
Humidity range		5 to 95 % RH at 50 °C (non-condensing)		
Polution degree		2		
Altitude		2000 m CAT III / 3000 m CAT II		3000 m max. CAT III

Electromagnetic compatibility	
Harmonic current emissions	IEC 61000-3-2
Flicker emissions	IEC 61000-3-3
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
Conducted immunity 150kHz to 80MHz	IEC 61000-4-6
Immunity to magnetic fields	IEC 61000-4-8
Immunity to voltage dips	IEC 61000-4-11
Radiated emissions	FCC part 15, EN 55022 Class B
Conducted emissions	FCC part 15, EN 55022 Class B

*Electrical Characteristics still under verification at time of printing of the catalogue, may be subject to change.

PM5000 Series
Functions and characteristics (cont.)

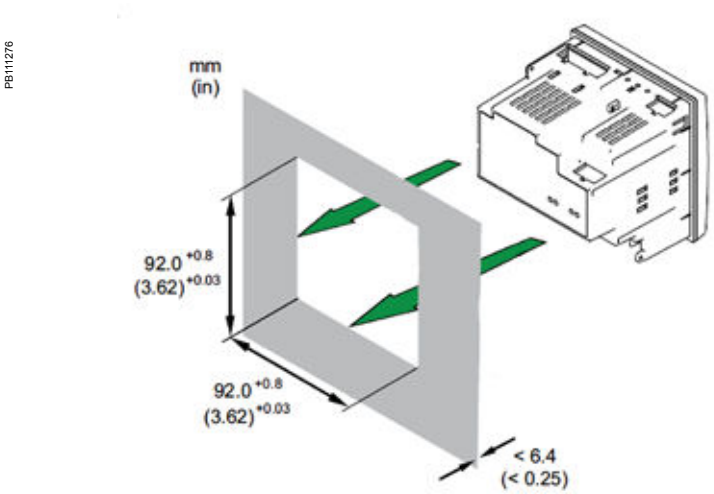
Safety	PM5100	PM5300	PM5500
Europe	CE, as per IEC 61010-1 Ed. 3 and IEC 62052-11		
U.S. and Canada	cULus as per UL61010-1 (3rd Edition)		
Measurement category (Voltage and Current inputs)	CAT III up to 277 V L-N / 480 V L-L ; CAT II up to 400 V L-N / 690 V L-L		CAT III up to 400 V L-N / 690 V L-L
Dielectric	As per IEC/UL 61010-1 Ed. 3		
Protective Class	II, Double insulated for user accessible parts		
Communication			
RS 485 port Modbus RTU, Modbus ASCII (7 or 8 bit), JBUS	2-Wire, 9600,19200 or 38400 baud, Parity - Even, Odd, None, 1 stop bit if parity Odd or Even, 2 stop bits if None; (Optional in PM51x and PM53x)		
Ethernet port: 10/100 Mbps; Modbus TCP/IP		1 Optional	2 (for daisy chain only, one IP address)
Firmware and language file update	Meter firmware update via the communication ports		
Isolation	2.5 kVrms, double insulated		
Human machine interface			
Display type	Monochrome Graphics LCD		
Resolution	128 x 128		
Backlight	White LED		
Viewable area (W x H)	67 x 62.5 mm		
Keypad	4-button		
Indicator Heartbeat / Comm activity	Green LED		
Energy pulse output / Active alarm indication (configurable)	Optical, amber LED		
Wavelength	590 to 635 nm		
Maximum pulse rate	2.5 kHz		

	PM5100		PM5300				PM5500	
Features and Options	**PM5100**	**PM5110**	**PM5310**	**PM5320**	**PM5330**	**PM5340**	**PM5560**	**PM5563**
Installation								
Fast installation, panel mount with integrated display	■	■	■	■	■	■	■	–
Fast installation, DIN rail mountable	–	–	–	–	–	–	–	■
Accuracy Display								
Display	**Cl 0.5**	**Cl 0.5**	**Cl 0.5**	**Cl 0.5**	**Cl 0.5**	**Cl 0.5**	**Cl 0.2**	**Cl 0.2**
Backlit LCD, multilingual, bar graphs, 6 lines, 4 concurrent values	■	■	■	■	■	■	■	■
Power and energy metering								
3-phase voltage, current, power, demand, energy, frequency, power factor	■	■	■	■	■	■	■	■
Multi-tariff	–	–	4	4	4	4	8	8
Power quality analysis								
THD, thd, TDD	■	■	■	■	■	■	■	■
Harmonics, individual (odd) up to	15th	15th	31st	31st	31st	31st	63rd	63rd
I/Os and relays								
I/Os	1DO	1DO	2DI/2DO	2DI/2DO	2DI/2DO	2DI/2DO	4DI/2DO	4DI/2DO
Relays	0	0	0	0	2	√2	0	0
Alarms and control								
Alarms	33	33	35	35	35	35	52	52
Set point response time, seconds	1	1	1	1	1	1	1	1
Single and multi-condition alarms	–	–	■	■	■	■	■	■
Boolean alarm logic	–	–	–	–	–	–	■	■
Communications								
Serial ports with modbus protocol	–	1	1	–	1	–	1	1
Ethernet port with Modbus TCP protocol	–	–	–	1	–	1	2**	2**
MID ready compliance, EN50470-1/3, Annex B and Annex D Class C		**PM5111**			**PM5331**	**PM5341**	**PM5561**	

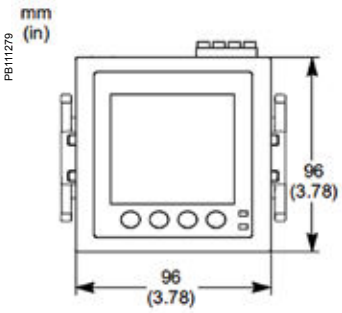
** 2 Ethernet ports for daisy chain, one IP address.

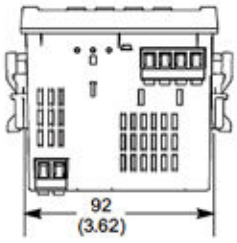
PM5000 Series
Dimensions and connection

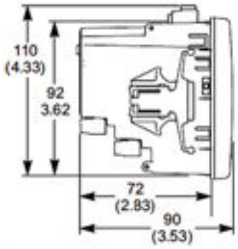
PM5000 Series meter flush mounting



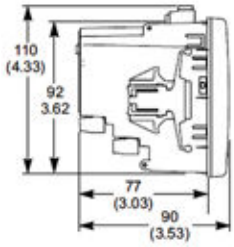
PM5000 Series meter dimensions



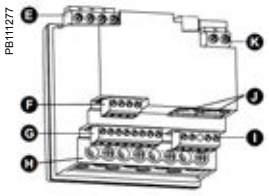




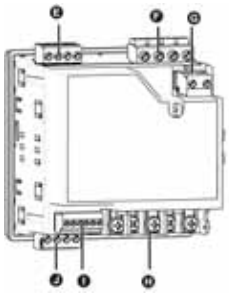
PM5100 / PM5300



PM5500



PM5500



PM5000 meter parts
A Menu selection buttons
B LED indicators
C Navigation or menu selections
D Maintenance and alarm notification area

PM5500 meter parts
E Voltage inputs
F RS-485 comms
G Digital inputs
H Current inputs
I Digital outputs
J Ethernet ports
K Control power

PM5100 / PM5300 meter parts
E Relay output (PM5300 only)
F Voltage inputs
G Control power
H Current inputs
I Status inputs/digital outputs
J Communications port: Ethernet (PM5300 only) or RS-485)

*Please see the **Installation Guide** for accurate and complete information on the installation of this product.*

PM800 series
Functions and characteristics

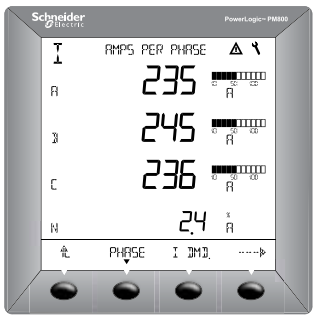
PE86134

Front view of PowerLogic PM800 series meter with integrated display.

PB101823-50

Rear view of PowerLogic PM800 series meter.

PE86229



PowerLogic PM800 series meter display screen showing bar graphs.

The PowerLogic PM800 series meters offers many high-performance capabilities needed to meter and monitor an electrical installation in a compact 96 x 96 mm unit. All models include an easy-to-read display that presents measurements for all three phases and neutral at the same time, an RS-485 Modbus communication port, one digital input, one KY-type digital output, total harmonic distortion (THD) metering, and alarming on critical conditions. Four models offer an incremental choice of custom logging and power quality analysis capabilities. Expand any model with field-installable option modules that offer a choice of additional digital inputs and outputs, analogue inputs and outputs, and Ethernet port.

Applications

- Panel instrumentation
- Sub-billing, cost allocation and energy management
- Remote monitoring of an electrical installation
- Power quality analysis
- Utility bill verification, utility contract optimization and load preservation.

Characteristics

Easy to install
Mounts using two clips, with no tools required. Direct connect the voltage inputs, with no need for potential transformers (PTs) up to 600 VAC.

Easy to operate
Intuitive navigation with self-guided, language-selectable menus.

System status at a glance
Large, anti-glare display with back-light provides summary screens with multiple values. Bar charts graphically represent system loading and I/O.

Custom alarming with time stamping
Over 50 alarm conditions, including over or under conditions, digital input changes, phase unbalance and more. The models PM850 and PM870 offer boolean logic that can be used to combine up to four alarms.

Power quality analysis
The PM800 series offers an incremental range of features for troubleshooting and preventing power quality related problems. All models offer THD metering. The PM810 with PM810LOG option and PM820 offer individual current and voltage harmonics readings. The PM850 and PM870 offer waveform capture (PM870 is configurable) and power quality compliance evaluation to the international EN50160 -ITI(CBEMA)/SEMI F-47 standards. The PM870 offers voltage and current disturbance (sag/swell) detection.

Extensive on-board memory
All models offer billing (energy and demand), maintenance, alarm and customizable data logs, all stored in non-volatile memory (PM810 requires PM810LOG option).

ANSI 12.20 Class 0.2S and IEC 62053-22 Class 0.5S accuracy for active energy
Accurate energy measurement for sub-billing and cost allocation.

IEC61557-12 performance standard
Meets PMD/SD/K70/0.5 and PMD/SS/K70/0.5 requirements for combined **P**erformance **M**easuring and monitoring **D**evices (PMD).

Trend curves and short-term forecasting
The models PM850 and PM870 offer trend logging and forecasting of energy and demand readings to help compare load characteristics and manage energy costs.

Expandable I/O capabilities
Use the on-board or optional digital inputs for pulse counting, status/position monitoring, demand synchronisation or control (gating) of the conditional energy metering. Use the on-board or optional digital outputs for equipment control or interfacing, controllable by internal alarms or externally through digital input status. Use the optional analogue inputs and outputs for equipment monitoring or interfacing.

Metering of other utilities (WAGES)
All models offer five channels for demand metering of water, air, gas, electricity or steam utilities (WAGES) through the pulse counting capabilities of the digital inputs. Pulses from multiple inputs can be summed through a single channel.

Modular and upgradeable
All models offer easy-to-install option modules (memory, I/O and communications) and downloadable firmware for enhanced meter capabilities.

Remote display
The optional remote display can be mounted as far as 10 m from the metering unit. The adapter includes an additional 2- or 4-wire RS-485/RS-232 communication port.

PM800 series
Functions and characteristics (cont.)

PB101814-36

PowerLogic PM800 series meter without display.

PE86134

PowerLogic PM800 series meter with integrated display.

PB101822-68

PowerLogic PM800 series meter with remote display.

PE86135

Remote display adapter with display and cable.

PB101819-32

Remote display adaptor alone.

Part Numbers

Description	
Meter without display	
Use the base meter unit without display to comply with voltage limitations for local regulations when door mounting is not possible, or when meter voltage exceeds regulations, or when local display is not required. When the meter is used without a display, configuration of the communications port is limited to the default (address 1, 9600 baud, parity even). Requires software to read data.	
PM810 meter unit only, no display, basic instrumentation, THD, alarming, 80 kB logging (with PM810LOG)	**PM810UMG**
PM820 meter unit only, no display, basic instrumentation, THD, alarming, 80 kB logging	**PM820UMG**
PM850 meter unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, waveform capture	**PM850UMG**
PM870 meter unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, configurable waveform capture and disturbance detection.	**PM870UMG**
Meter with integrated display	
Use the meter with integrated display for panel mounting when door space is available and when voltage usage is within the local regulation limits.	
PM810 meter with integrated display,	**PM810MG**
PM820 meter with integrated display	**PM820MG**
PM850 meter with integrated display	**PM850MG**
PM870 meter with integrated display	**PM870MG**
Meter with remote display	
Conveniently packaged kit consist of a base meter (810, 820, 850 or 870) with a remote display, remote display adapter, and remote display cable 3 m (9.ft 10 inches).	
PM810 meter with remote display	**PM810RDMG**
PM820 meter with remote display	**PM820RDMG**
PM850 meter with remote display	**PM850RDMG**
PM870 meter with remote display	**PM870RDMG**
Parts and accessories	
Remote display adapter with remote display and a 3 m (9 ft 10 inch) cable Use this combination of remote display, adapter, and 3 m cable to equip a base meter unit for use with a remote display. In addition, the display can be carried from meter to meter, enabling you to purchase one display for multiple meters. Each base unit meter must be equipped with a remote display adapter (PM8RDA).	**PM8RDMG**
Remote display adapter alone When added to the front of the base unit (PM8xxU), the adapter brings two additional communication ports: one for the remote display and one 4-wire/2-wire RS 485/RS 232.	**PM8RDA**

Part number list continued on next page.

PM800 series
Functions and characteristics (cont.)

PowerLogic PM870 with ECC module (bottom view showing connectors and configuration switches).

ECC module (front view)

ECC module (side view showing LED indicators).

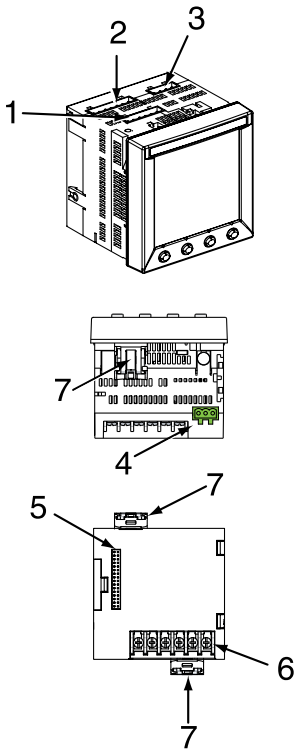
PowerLogic PM8M26 module.

PowerLogic PM800 with PM8M22 and PM8M26 modules.

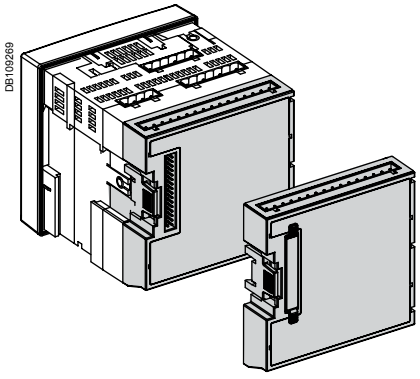
Part Numbers - continued

Description	
Optional modules	
Ethernet communication module provides a 10/100BaseTx UTP port, an RS-485 Modbus serial master port, Ethernet-to-serial line gateway functionality, and an embedded web server that is fully compliant with Transparent Ready - Level 1 (TRe1) systems. The PM8ECC supports a private host PM8ECC MIB. Use of this MIB allows the reading of Basic Metering Data, Configuration and Status of I/Os and Configuration and Status of Alarms, plus SNMP Trap generation in response to any PM8 on-board alarms.	**PM8ECC**
2 relay outputs, 2 digital inputs	**PM8M22**
2 relay outputs, 6 digital inputs	**PM8M26**
2 relay outputs, 2 digital inputs, 2 analogue outputs, 2 analogue inputs	**PM8M2222**
PM810 optional logging module for on-board data recording, uses a non-volatile, battery-backed internal clock	**PM810LOG**
RJ11 Extender kit to mount RJ11 jack in panel door (for use with PM800, CM3000, and CM4000 series meters)	**RJ11EXT**
Cable for remote display adapter 1.25 m (4 ft)	**CAB4**
Cable for remote display adapter 3 m (9 ft 10 inch)	**CAB12**
Cable for remote display adapter 9.14 m (30 ft)	**CAB30**

PM800 series
Functions and characteristics (cont.)



PowerLogic PM800 series connectors.
1. Control power.
2. Voltage inputs.
3. Digital input/output.
4. RS 485 port.
5. Option module connector.
6. Current inputs.
7. Mounting clips.



PowerLogic PM800 series meter with I/O module.

Selection guide		PM810	PM820	PM850	PM870
Performance standard					
ANSI 12.20 Class 0.2S		■	■	■	■
IEC 61557-12 PMD/SD/K70/0.5 and PMD/SS/K70/0.5		■	■	■	■
General					
Use on LV and HV systems		■	■	■	■
Current and voltage accuracy		0.5 %/0.2%	0.5 %/0.2%	0.5 %/0.2%	0.2 %/0.2%
Active energy accuracy (5% to 200% of load)		0.2 %	0.2 %	0.2%	0.2%
Number of samples per cycle		128	128	128	128
Instantaneous rms values					
Current, voltage, frequency		■	■	■	■
Active, reactive,apparent power	Total & per phase	■	■	■	■
Power factor	Total & per phase	■	■	■	■
Energy values					
Active, reactive, apparent energy		■	■	■	■
Configurable accumulation mode		■	■	■	■
Demand values					
Current	Present & max.	■	■	■	■
Active, reactive, apparent power	Present & max.	■	■	■	■
Predicted active, reactive, apparent power		■	■	■	■
Synchronisation of the measurement window		■	■	■	■
Demand calculation mode	Block, sliding, thermal	■	■	■	■
Other measurements					
Hour counter		■	■	■	■
Power quality measurements					
Harmonic distortion	Current & voltage	■	■	■	■
Individual harmonics	Current & voltage	31 (1)	31	63	63
Waveform capture		-	-	■	■ (2)
EN50160 - ITI(CBEMA)/SEMI F-47				■ (4)	■
Sag and swell detection		-	-	-	■
Data recording					
Min/max of instantaneous values		■	■	■	■
Data logs		2 (1)	2	4	4
Event logs		-	■	■	■
Trending / forecasting		-	-	■	■
GPS synchronisation		■ (1)	■	■	■
Alarms		■	■	■	■
Time stamping		■ (1)	■	■	■
Display and I/O					
White backlit LCD display		■	■	■	■
Multilingual		■	■	■	■
Digital input (standard/optional)		1/12	1/12	1/12	1/12
Digital output (standard/optional)		1 KY/4 RY	1 KY/4 RY	1 KY/4 RY	1 KY/4 RY
Analogue inputs (standard/optional)		0/4	0/4	0/4	0/4
Analogue outputs (standard/optional)		0/4	0/4	0/4	0/4
Input metering capability (number of channels)		5	5	5	5
Communication					
RS 485 port		2-wire	2-wire	2-wire	2-wire
Modbus protocol		■	■	■	■
RS 232/RS 485, 2- or 4-wire Modbus RTU/ ASCII (with addition of PM8RDA module)		■	■	■	■
Ethernet 10/100Base Tx UTP port and RS485 Modbus serial master port with PM8ECC		■	■	■	■

Option modules selection guide

The PM800 can be fitted with 2 optional modules, unless otherwise indicated (3)

PM8ECC module

10/100BaseTx UTP port, RS-485 Modbus serial master port, Ethernet to serial line gateway, embedded web server

Input/Output modules	PM8M22	PM8M26*	PM8M2222
Relay outputs	2	2	2
Digital inputs	2	6	2
Analogue outputs 4-20 mA			2
Analogue inputs 0-5 Vdc or 4-20 mA			2

** Includes a 24 Vdc Power Supply that can be used to power the digital inputs*
(1) With PM810LOG, battery-backed internal clock and 80 kB memory. (2) Configurable. (3) Series 800 Power Meters supports up to two option modules. When PM8M2222 & PM8ECC are mounted together with control power>370 V AC temperature rating must be reduced to -25°C to 50°C. Same applies when using two PM8M2222. (4) PM850 does not include sag or swell detection.

PM800 series
Functions and characteristics (cont.)

Electrical characteristics			
Type of measurement			63rd harmonic, 128 samples per cycle
Measurement accuracy standard IEC 61557-12 compliant			
	Current		0.5% from 0.5 A to 10 A
	Voltage		0.2% 10 V - 277 V
	Power Factor		+/- 0.002 from 0.500 leading to 0.500 lagging
	Active Power		0.2%
	Frequency		+/- 0.01 Hz at 45 to 67 Hz +/- 0.01 Hz at 350 to 450 Hz
	Active Energy		IEC 62053-22 Class 0.5S and ANSI C12.20 Class 0.2S
	Reactive Energy		IEC 62053-23 Class 2
Data update			1 s
Input-voltage characteristics	Measured voltage		0 to 600 V AC (direct L-L) 0 to 347 V AC (direct L-N) up to 3.2 MV AC (with external VT)
	Metering over-range		1.5 Un
	Impedance		5 MΩ
	Frequency measurement range		45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Primary	Adjustable from 5 A to 32767 A
		Secondary	1 A or 5 A
	Measurement input range		5 mA to 10 A AC
	Permissible overload		15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance		< 0.1 Ω
	Load		< 0.15 VA
Control Power	AC		115 to 415 ±10 % V AC, 15 VA with options at 45 to 67 Hz or 350 to 450 Hz
	DC		125 to 250 ±20 % V DC, 10 W with options
	Ride-through time		45 ms at 120 V AC or 125 V DC
Inputs/Outputs (2)			
Standard (meter unit)	1 digital KY pulse output		6 to 220 V AC ± 10% or 3 to 250 V DC ± 10%, 100 mA max. at 25 °C, 1350 V rms isolation
	1 digital input		24 to 125 V AC/DC ±10 %, < 5 mA maximum burden, 1350 Vrms isolation
PM8M22 option	2 relay outputs (1)		6 to 240 V AC or 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	2 digital inputs		19 to 30 V DC, 5 mA max. at 24 V DC
PM8M26 option	2 relay outputs (1)		6 to 240 V AC, 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	6 digital inputs		20 to 150 V AC/DC, 2 mA max.
	24 V internal supply		20 - 34 V DC, 10 mA max. (feeds 6 digital inputs)
PM8M2222 option	2 relay outputs (1)		6 to 240 V AC, 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	2 digital inputs		20 to 150 V AC/DC, 2 mA max.
	2 analogue outputs		4 to 20 mA dc into 600 ohms maximum
	2 analogue inputs		Adjustable from 0 to 5 V DC or 4-20 mA
Switching frequency (digital I/O)	Standard	Input/output	25 Hz, 50 % duty cycle (20 ms ON/OFF)
	PM8M22	Input/output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
	PM8M26 and PM8M2222	Input	25 Hz, 50 % duty cycle (20 ms ON/OFF)
		Output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
Mechanical characteristics			
Weight (meter with integrated display)			0.6 kg
IP degree of protection (IEC 60529)			IP52 integrated display. Type 12 compliant remote display (with gasket). IP30 meter body
Dimensions	Without options		96 x 96 x 70 mm (mounting surface)
	With 1 option		96 x 96 x 90 mm (mounting surface)
Environmental conditions			
Operating temperature	Meter		-25 °C to +70 °C (2)
	Display		-10 °C to +50 °C
Storage temp.	Meter + display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 40 °C (non-condensing)
Pollution degree			2
Installation category			III, for distribution systems up to 347 V L-N / 600 V AC L-L
Dielectric withstand			As per EN 61010, UL508
Altitude			3000 m max.

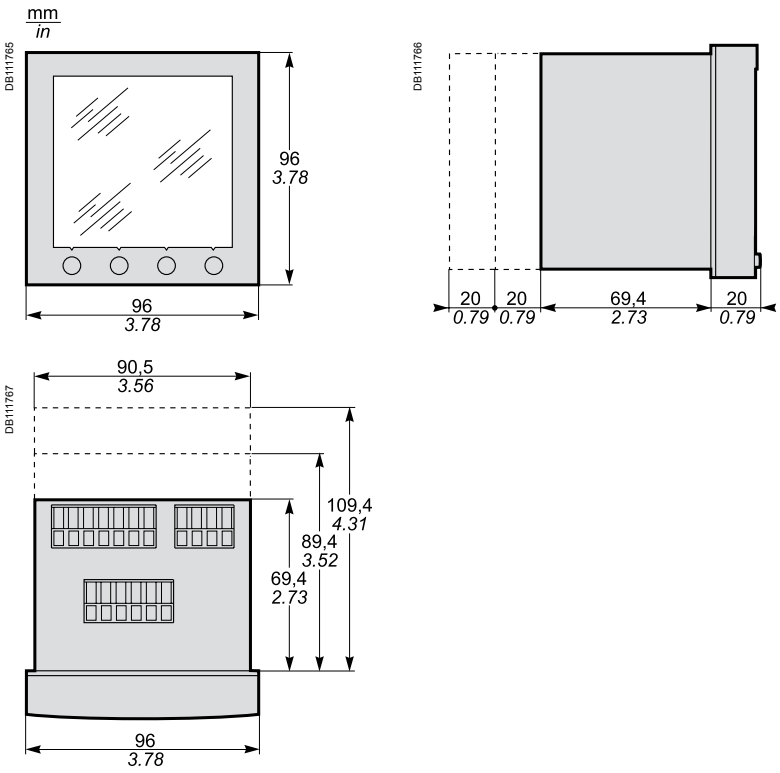
(1) Mechanical endurance: 15 million operations, Electrical endurance:25000 commutations at 2 A / 250 V AC (2) Series 800 Power Meters supports up to two option modules. When PM82222 & PM8ECC are mounted together with control power >370 V AC temperature rating must be reduced to -25°C to 50°C. Same is true when using two PM8M2222.

PM800 series
Functions and characteristics (cont.)

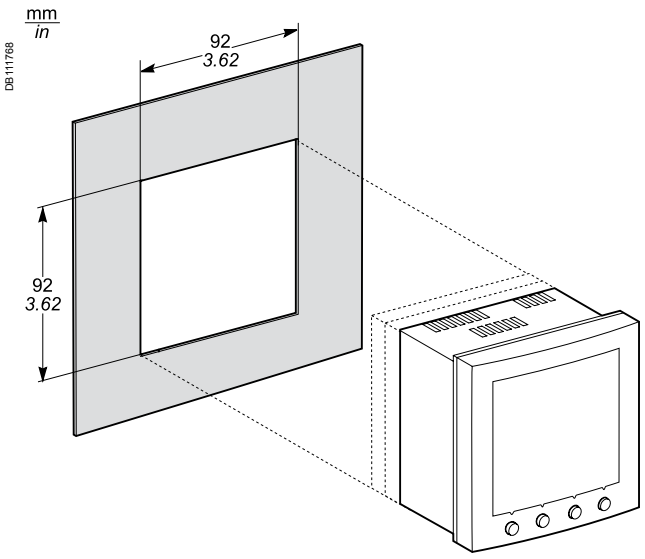
Electromagnetic compatibility		
Electrostatic discharge	Level III (IEC 61000-4-2)	
Immunity to radiated fields	Level III (IEC 61000-4-3)	
Immunity to fast transients	Level III (IEC 61000-4-4)	
Immunity to impulse waves	Level III (IEC 61000-4-5)	
Conducted immunity	Level III (IEC 61000-4-6)	
Immunity to magnetic fields	Level III (IEC 61000-4-8)	
Immunity to voltage dips	Level III (IEC 61000-4-11)	
Conducted and radiated emissions	CE industrial environment/FCC part 15 class A EN 55011	
Harmonics emissions	IEC 61000-3-2	
Flicker emissions	IEC 61000-3-3	
Surge immunity	IEC 61000-4-12	
Surge withstand capability (SWC)	ANSI C37.90.1.2002	
Safety		
Europe	CE, as per IEC 61010-1 ⧈ (1)	
U.S. and Canada	cULus (UL508 and CAN/CSA C22.2 No. 14-M95, Industrial Control Equipment)	
Onboard communications		
RS 485 port	2-wire, up to 38400 baud, Modbus	
Model-dependent characteristics		
Data Logs	PM810 with PM810LOG, PM820, PM850 and PM870: - 1 billing log - 1 customisable log PM850 and PM870 only: 2 additional custom logs	
Min./max.	Worst min. and max. with phase indication for Voltages, Currents, Voltage unbalance, and THD. Min. and max. values for power factor (True and Displacement), power (P, Q, S) and frequency	
One event log	Time stamping to 1 second	
Trend curves (PM850 and PM870 only)	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: - every second for one minute for the 1-minute curve - every minute for one hour for the 1-hour curve - every hour for one day for the 1-day curve - every day for one month for the 1-month curve	
Hour counter	Load running time in days, hours and minutes	
Energy per shift	Up to three user-defined intervals per day Available for all models (the PM810 requires the PM810LOG module)	
Forecasting (PM850 and PM870 only)	Forecasting of the values for the trended parameters for the next four hours and next four days	
PM850 waveform capture	Triggered manually or by alarm, 3-cycle, 128 samples/cycle on 6 user configurable channels	
PM870 enhanced waveform capture	From 185 cycles on 1 channel at 16 samples per cycle up to 3 cycles on 6 channels at 128 samples per cycle	
Alarms	Adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm Historical and active alarm screens with time stamping Response time: 1 second Boolean combination of four alarms is possible using the operators NAND, AND, OR, NOR and XOR on PM850 and PM870 Digital alarms: status change of digital inputs	
Memory available for logging and waveform capture (2)	80 kbytes in PM810 with PM810LOG and PM820 800 kbytes in PM850 and PM870	
Firmware update (all models)	Update via the communication ports File download available free from www.powerlogic.com	
Bar graphs (all models)	Graphical representation of system performance	
Display characteristics		
Languages	English, French, Spanish, German, Russian, Turkish and Portuguese.	
Display screen	Back-lit white LCD (6 lines total, 4 concurrent values)	
Dimensions	Display screen viewable area	73 x 69 mm
	Integrated display Overall	96 x 96 mm
	Depth meter + display	69.4 mm + 17.8 mm
	Remote display Overall	96 x 96 x 40 mm
Weight	Meter with remote display adapter	0.81 kg
	Remote display	0.23 kg

Power Meter Series 800
Dimensions and connection

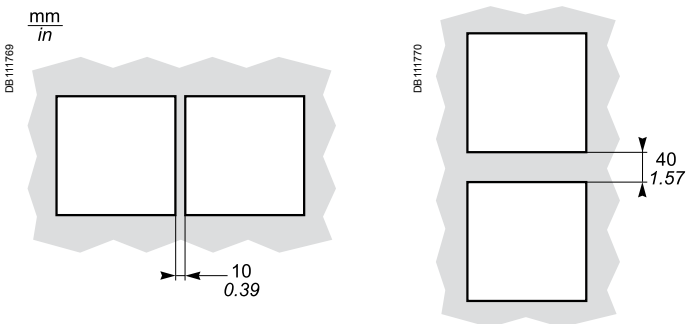
Power meter with integrated display
Dimensions



Front-panel mounting (meter with integrated display)



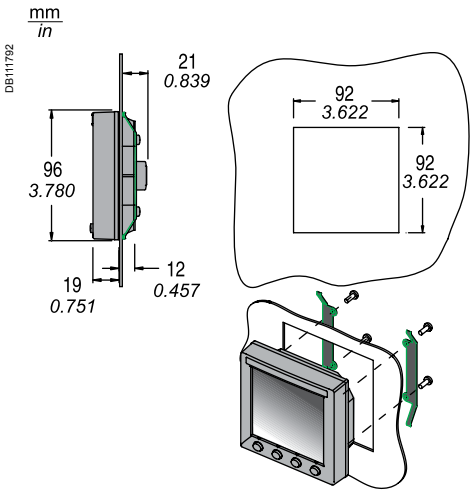
Spacing between units



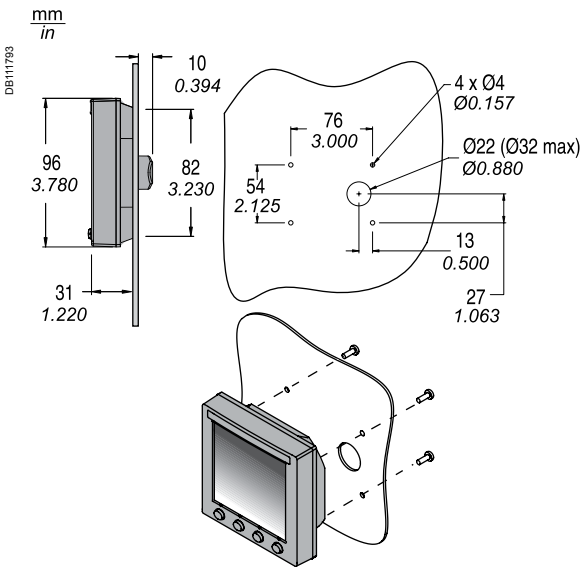
Power Meter Series 800
Dimensions and connection (cont.)

Remote display door mounting

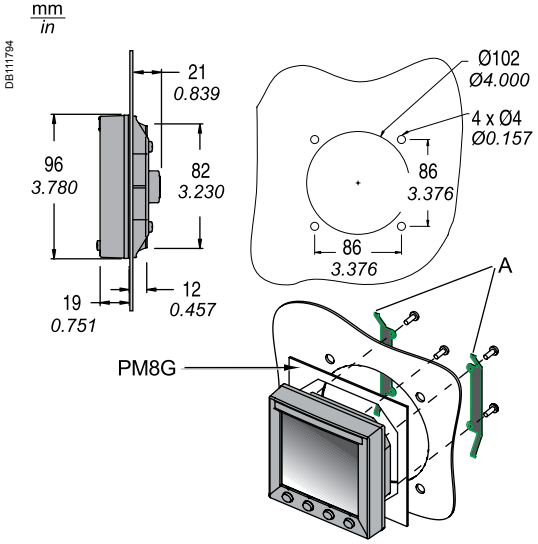
Flush mounting



Surface mount



Mounting in a Ø102 cutout (replace analogue device: ammeter, voltmeter, etc.)



ION7300 Series
Functions and characteristics

PE86151a

PowerLogic™ ION 7300 Series meter.

Used in enterprise energy management applications such as feeder monitoring and sub-metering, ION7300 Series meters offer unmatched value, functionality, and ease of use. ION7300 Series meters interface to PowerLogic StrxureWare software or other automation systems to give all users fast information sharing and analysis.

ION7300 Series meters are an ideal replacement for analogue meters, with a multitude of power and energy measurements, analogue and digital I/O, communication ports, and industry-standard protocols. The ION7330 meter has on-board data storage, emails of logged data, and an optional modem. The ION7350 meter is further augmented by more sophisticated power quality analysis, alarms and a call-back-on-alarm feature.

Applications

Power monitoring and control operations.
Power quality analysis.
Cost allocation and billing.
Demand and power factor control.
Load studies and circuit optimisation.
Equipment monitoring and control.
Preventive maintenance.

Main characteristics

Accurate metering
Ensure metering accuracy with compliance to IEC 60687 class 0,5S standard.

Multiple communications options: Ethernet - Serial - Modem
Gateway functionality simplifies communications architecture and reduces leased line or connection costs. Concurrent, independent ports communicate with a variety of protocols such as ION, DNP 3.0, Modbus RTU, and Modbus TCP.

Easy to read display
An easy-to-read front panel with a back-lit LCD screen supports local data display and basic setup.

Set automatic alarms
Use configurable event priorities, logical operators, and setpoints to define alarm conditions and set alarms.

Integrate with software
Easily integrate ION7300 Series meters with an energy management or SCADA system to provide remote display at a PC workstation, as well as remote configuration and manual control capabilities.

Notification of alarms via email
Alarm notifications sent via email to any workstation, cell phone, pager, or PDA.

Server for custom HTML pages
An on-board Web server combined with an Ethernet port offers quick and easy access to real-time energy and basic power quality information without special software.

Monitor dips and swells (ION7350)
Detect dips and swells on any voltage channel.

Interoperability expands existing networks
The ION7330/ION7350 concurrently communicates via multiple protocols, allowing you to extend an existing Modbus, DNP, or Enterprise network.

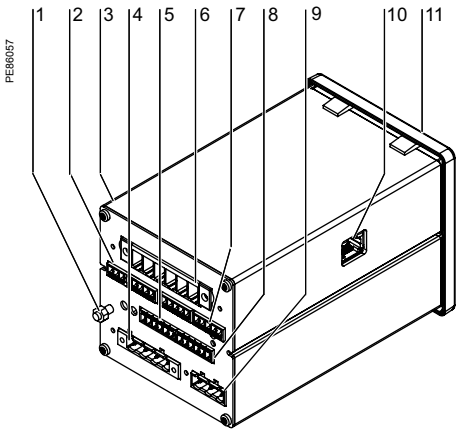
Memory
Non-volatile memory (300kB) ensures that valuable information can be preserved between intervals.

Part numbers

ION7300 series	
ION7330	**M7330**
ION7350	**M7350**

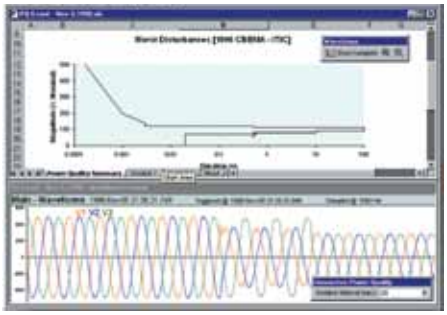
Refer to the part number section for further explanations.

ION7300 Series
Functions and characteristics (cont.)



PowerLogic ION7330/ION7350

1 *Chassis Ground*
2 *Analogue Inputs*
3 *Internal Modem Port*
4 *Voltage Inputs*
5 *Digital Outputs*
6 *Current Inputs*
7 *Digital Inputs*
8 *RS-485 Bus*
9 *Power Supply*
10 *Ethernet Port*
11 *IR Port*



Disturbance waveform capture and power quality report.

Selection guide		ION7330	ION7350
General			
Use on LV and HV systems		■	■
Current and voltage accuracy		0.25% + 0.05 % full scale	
Power accuracy	Real (kW)	0.5% reading	
	Apparent (kVA)	0.5% + 0.1%	
	Reactive (kvar)	1.5% reading	
Energy accuracy	Real (kWh)	0.5% reading	
	Apparent (kVAh)	1.0% reading	
	Reactive (kvarh)	1.5% reading	
Number of samples per cycle		32	64
Instantaneous rms values			
Current, voltage, frequency		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current	Present and max.	■	■
Active, reactive, apparent power	Present and max.	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Setting of calculation mode	Block, sliding	■	■
Power quality measurements			
Harmonic distortion	Current, voltage	■	■
Individual harmonics		15th	31st
Waveform capture		-	■
Detection of voltage dips and swells		-	■
Data recording			
Min/max of instantaneous values		■	■
Historical logs	max. # of channels	32	96
Waveform logs	max. # of channels	-	48
Trending / forecasting		-	■
Alarms		■	■
Time stamp resolution (s)		0.001	0.001
300 Kbyte memory		■	■
Display and I/O			
Display		■	■
Wiring self-test		■	■
Analogue inputs / analogue outputs		4/4	4/4
Digital status inputs/counter		4	4
Digital relay outputs		4	4
Communication			
RS-485 port		2	2
Modbus protocol		■	■
Ethernet (Modbus/TCP/IP protocols)		1	1
Ethernet gateway (EtherGate)		■	■
Internal modem		1	1
Modem gateway (ModemGate)		■	■
Infrared optical port		1	1
DNP 3.0 via serial, modem, IR ports		■	■
HTML page web server (WebMeter)		■	■

ION7300 Series
Functions and characteristics (cont.)

PE86236

PowerLogic ION7300 Series remote terminal display.

Electrical characteristics		
Type of measurement		True rms up to the 15th harmonic (31st for ION7350) 32 samples/cycle (64 for ION7350)
Measurement accuracy	Current and voltage	0.25% + 0.05%
	Power	Real: 0.5% reading Apparent: 0.5% + 0.1% Reactive (>5% FS): 1.5% reading
	Frequency	± 0.01 Hz
	Power factor (at Unity PF)	± 1.5% reading
	Energy(1)	kWh: 0.5% reading kVAh: 1.0% reading kvarh: 1.5% reading
Data update rate		1 second
Input-voltage characteristics	Measured voltage	50 - 347 VAC L-N 3-phase (87-600 L-L) 50 - 300 VAC L-N single phase (100 - 600 L-L)
	Metering over-range	25%
	Overload withstand	1500 VAC continuous 3250 VAC for 1 second non-recurring
	Impedance	>2 M Ohms/phase (phase - Vref)
	Frequency range	40 - 70 Hz
Input-current characteristics	CT ratings	5 A nominal / 10 A full scale
	Measurement range	20 mA - 10 A rms (+20%, 300 V rms to ground)
	Overload withstand	20 A continuous 500 A for 1 second non-recurring
	Burden	Worst case (at 10 A): 0.0625 VA
	Impedance	> 2 M Ohms/phase (phase-Vref)
Power supply	AC	95 - 240 VAC (± 10%), (47 - 440 Hz)
	DC	120 - 310 VDC (± 10%) 0.2 A worst case loading (12 W) at 100 VAC at 25°C
	P24 option	20 to 60 VDC (± 10%)
Input/outputs	4 Digital status inputs (7330/7350)	Self-excited (internal 30 VDC supply); Min pulse width: 25 msec; Max 40 transitions/sec
	4 digital outputs	Form A Solid State; Max forward current: 80 mA Max voltage: 30 V
	4 optional analogue inputs	*0-20 mA (scalable to 4-20 mA) option* Input impedence: 24.3 Ohms; Accuracy: < ± 0.3% of full-scale; Update rate: 1 second; Max common mode voltage: 30 V; Sample rate: 16 samples/second
		0-1 mA option same as above except: Input impedence: 475 Ohms
	4 optional analogue outputs	*0-20 mA (scalable to 4-20 mA) option* Max load drive capability: 500 Ohms; Accuracy: ± 0.3% of full-scale; Max common mode voltage: 30 V
		0-1 mA option same as above except: Max load drive capability: 10 kOhms
Mechanical characteristics		
Weight		1.8 kg
IP degree of protection		Integrated display: front IP 50; back IP 40 Transducer unit (no display): IP 40
Dimensions	Standard model	96 x 96 x 162.2 mm
	TRAN model	60 x 100 x 164.5 mm
Environmental conditions		
Operating temperature		-20 to +60° C ambient air
Storage temperature		-30 to +85°C
Humidity rating		5% to 95% non-condensing
Altitude		Less than 2000 m above sea level
Installation category		III, for distribution systems
Pollution degree		2
Dielectric withstand		As per IEC 61010, UL3111
Electromagnetic compatibility		
Electrostatic discharge		EN 60687:1993
Immunity to electromagnetic HF fields		EN 60687:1993
Immunity to fast transients		IEC 61000-4-4
Conducted and radiated emissions		EN 55014-1:1993
Safety		
Europe		IEC 1010-1
USA and Canada		UL 3111 and CSA C22.2 No. 1010-1

(1) Accuracy complies with IEC 687 class 0.5S and ANSI 12.20 class 0.5 at 25°C.

ION7300 Series
Functions and characteristics (cont.)

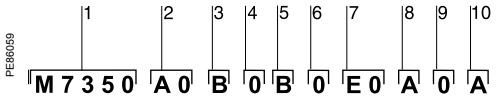
PE86004

Example WebMeter page showing realtime values.

Communication	
RS-485 ports	Optically isolated Up to 19,200 bauds Protocols: ION, DNP 3.0, Modbus RTU, GPS
Ethernet port (Modbus TCP protocol)	Up to 10 Mbps With EtherGate Optional 10Base-T
Infrared optical port	Front panel ANSI Type 2 Up to 19,200 bauds Protocols: ION, Modbus RTU, DNP 3.0
Internal modem	From 300 to 33,600 bauds ModemGate Call-back feature(1)
Firmware characteristics	
Data logs	Scheduled or event driven 7330: Maximum of 2 data logs, 32 parameters 7350: Maximum of 6 data logs, 96 parameters
Harmonic distortion	Individual and total up to the 15th harmonic (31st for 7350)
Sag/swell detection (1)	Detects dips and swells on any voltage channel
Instantaneous	True rms, per phase, and total for: - Voltage and current - Active (kW), reactive (kvar), and apparent (kVA) power - Power factor and frequency - Voltage and current unbalance
Min/max logging	Perform on any parameter, over any time interval Min and max values for all basic power parameters: - Voltage per phase - Current per phase - Active (kW), reactive (kvar), apparent (kVA) power - Power factor & frequency - Rolling block demand for kW, kvar, kVA
Waveform captures	Simultaneous capture of events on all channels. up to 48 cycles each, 64 samples/cycle. Maximum of 6,900 cycles for contiguous waveform capture
Alarms	Single- and multi-condition alarms, call-out on alarms, define alarms conditions with configurable event priorities
Memory	300 kB standard
Display characteristics	
Integrated display	4-parameter to single parameter large character displays, back-lit LCD with adjustible contrast
Languages	English

(1) Available on ION7350 only.

ION7300 Series
Functions and characteristics (cont.)



Example and explanation of product part number.

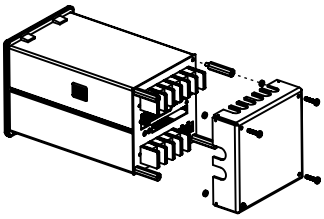
Part numbers

	Item	Code	Description
1	Model	M7350	**ION7350:** Advanced power meter with basic sag/swell detection, waveform recording, harmonics (up to the 31st), high-speed data logging and automatic modem dial-out, multi-port communications, 4 digital inputs and 4 digital outputs.
		M7330	**ION7330:** Advanced power meter with over 200 high-accuracy, 3-phase measurements, data logging, multiport communications, 4 digital inputs and 4 outputs
2	Form factor	A0	Integrated display, with front optical port
		R0	Transducer with RMD (remote display), with front optical port. DOES NOT support Analogue Input and/or Analogue Output options. Not available with Security options RMICAN or RMICAN-SEAL.
		R1	Same as R0, but with DIN rail mounts on the transducer. DOES NOT support Analogue Input and/or Analogue Output options.
		T0	Transducer (no display). Note you cannot use an RMD on this meter if you order the Analogue Input and/or Analogue Output options. Not available with Security options RMICAN or RMICAN-SEAL.
		T1	Transducer (no display) with DIN rail mount. Note you cannot use an RMD on this meter if you order the Analogue Input and/or Analogue Output options. Not available with Security options RMICAN or RMICAN-SEAL.
3	Current inputs	B	5 Amp nominal, 10 Amp full scale current input
4	Voltage inputs	0	Autoranging (50 to 347 VAC +25%)
5	Power supply	B	P240 power supply (95-240 VAC/47-4f40 Hz/120-310 VDC)
		C	P24 power supply (20 to 65 VDC)
6	System frequency	0	Autoranging (50 and 60 Hz)
7	Communications	Z0	No communications.
		A0	Two RS-485 ports
		C1	One RS-485 EtherGate port, one RS-485 ModemGate port, 10Base-T Ethernet (RJ45), 33.6k universal internal modem. DOES NOT support Analogue Input and/or Analogue Output options.
		M1	One 33.6k universal internal modem (RJ11) port, one RS-485 port, one RS-485 ModemGate port.
		E0	One RS-485 port, one 10Base-T Ethernet (RJ45)
8	Inputs/Outputs	A	No analogue inputs/outputs. You must choose this option if ordering Display-only or RMD remote display options (Form Factor types “D” or “R”), or Ethernet option (Communications options “E0”).
		M	Four 0 to 1 mA analogue inputs & four 0 to 1 mA analogue outputs. NOT AVAILABLE with RMD or Ethernet options
		N	Four 0 to 20 mA analogue inputs & four 0 to 20 mA analogue outputs. NOT AVAILABLE with RMD or Ethernet options
9	Security	0	Password protected, no hardware lock
		2	Password protected with hardware lock enabled
		3	(ION7330 model only) RMICAN Measurement Canada approved
		4	(ION7330 model only) RMICAN-SEAL Measurement Canada approved, factory sealed[1]
		6	Password protected with security lock enabled, terminal cover and UK OFGEM labels
10	Special order	A	None
		B	Pre-set to MODBUS (available for Form Factor T0, T1, T2 and T3 only). Not available with Security options RMICAN or RMICAN-SEAL.
		C	Tropicalisation treatment applied
		D	Tropicalisation treatment applied and pre-set to MODBUS (available for Form Factor T0, T1, T2 and T3 only). Not available with Security options RMICAN or RMICAN-SEAL.

[1] A completed ION7300 series RMICAN-SEAL checklist must accompany each RMICAN-SEAL meter order.

ION7300 Series
Functions and characteristics (cont.)

Part numbers (cont'd)		
Transducer unit		
ION7330 TRAN	No display	**T0**
	With DIN rail mount	**T1**
ION7350 TRAN	No display	**T0**
	With DIN rail mount	**T1**
Communications		
ION7330	Two RS-485 ports	**A0**
	One RS-485 EtherGate port, one RS-485 ModemGate port, 10Base-T Ethernet (RJ45), 33.6k universal internal modem[1]	**C1**
	One 10Base-T Ethernet (RJ45) port, one RS-485 port, one RS485 EtherGate port[1]	**E0**
	One 33.6k universal internal modem (RJ11) port, one RS-485 port, one RS-485 ModemGate port	**M1**
ION7350	Two RS-485 ports	**A0**
	One RS-485 EtherGate port, one RS-485 ModemGate port, 10Base-T Ethernet (RJ45), 33.6k universal internal modem (RJ11)[1]	**C1**
	One 10Base-T Ethernet (RJ45) port, one RS-485 port, one RS-485 EtherGate port[1]	**E0**
	One 33.6k universal internal modem (RJ11) port, one RS-485 port, one RS-485 ModemGate port	**M1**



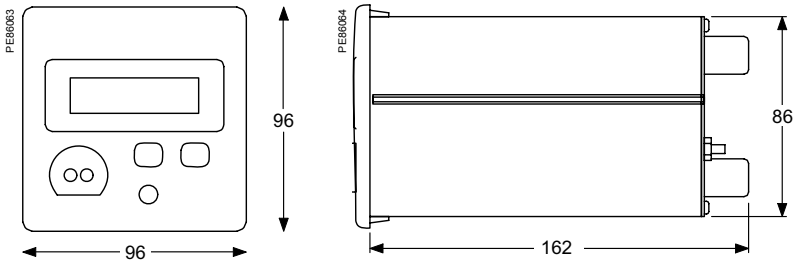
Terminal strip cover.

Remote modular display	
Remote Modular Display with 6 foot DB25 cable	**RMD-7330**
Remote Modular Display with 6 foot DB25 cable	**RMD-7350**
Terminal strip cover	
Terminal strip cover	**TERMCVR-73XX**
DB9 optical probe	
Optical probe (DB-9) for use with ION7300 Series meters	**OPTICAL-PROBE**
Water resistant gasket	
Water resistant gasket	**GSKT**

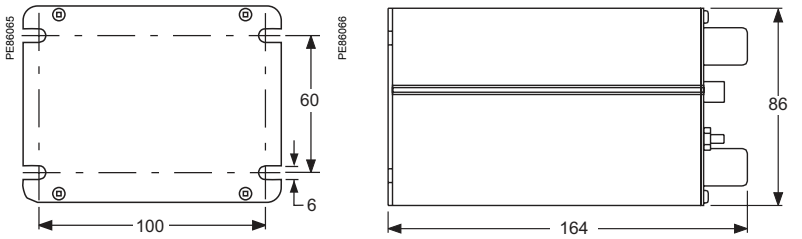
(1) *Does NOT support Analogue Input and/or Analogue Output options.*

ION7300 Series
Dimensions and connection

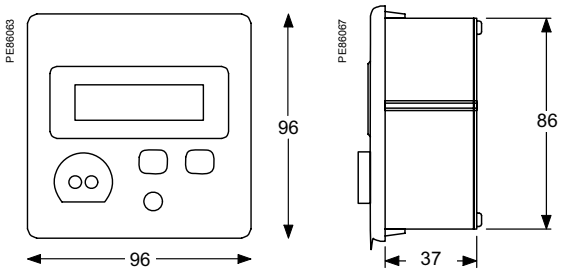
ION7300 Series dimensions



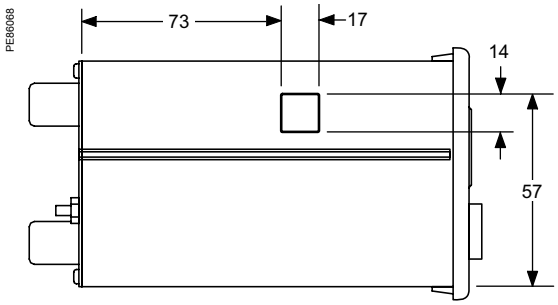
ION7300 Series TRAN dimensions



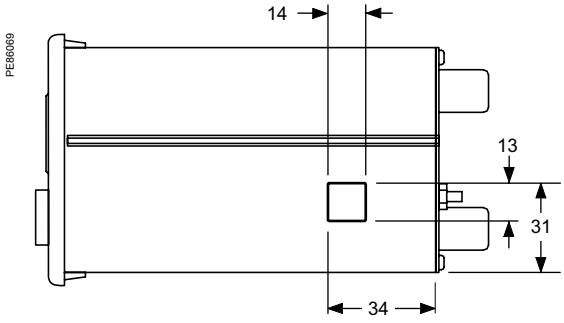
ION7300 Series RMD dimensions



Ethernet port location (if equipped)

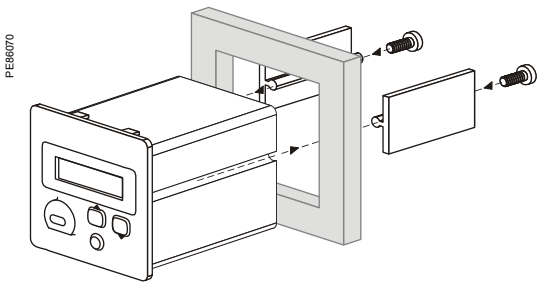


Internal modem port location (if equipped)



ION7300 Series
Dimensions and connection (cont.)

Front panel mounting



ION7550 / ION7650
Functions and characteristics

Used at key distribution points and sensitive loads, PowerLogic™ ION7550 and ION7650 meters offer unmatched functionality including advanced power quality analysis coupled with revenue accuracy, multiple communications options, web compatibility, and control capabilities. Customise metering or analysis functions at your work station, without hard wiring. Just link drag-and-drop icons or select default settings. Integrate the meters with StruxureWare Power Monitoring software or share data with SCADA systems via 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.

IEC 61850 protocol
Increase interoperability and decrease engineering time using standard protocol.

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 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 ed. 2[(1)], EN50160[(1)], IEC 61000-4-7[(1)], IEC 61000-4-15[(1)], IEEE 519, IEEE 1159, and CBEMA/ITIC). Evaluate flicker based on IEC 61000-4-15[(1)] and IEEE 1453[(1)].

Detect waveshape 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.

Alarm setpoint learning
The meter analyses the circuit and recommends alarm setpoints to minimise nuisance or missed alarms.

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*

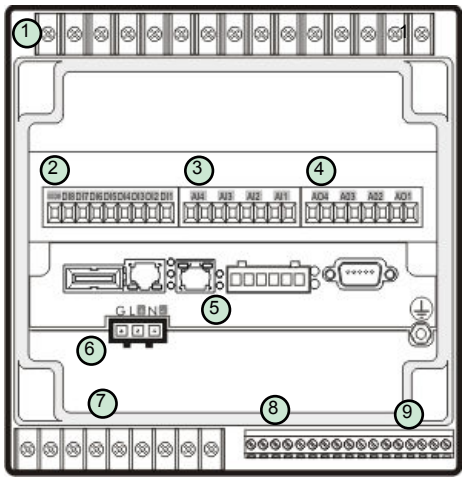
Part numbers

ION7550 / ION7650	
ION7550	**M7550**
ION7650	**M7650**
SE remote display	**M765RD**
SE remote display w/power supply	**M765RDPS**

(1) ION7650 only

ION7550 / ION7650
Functions and characteristics (cont.)

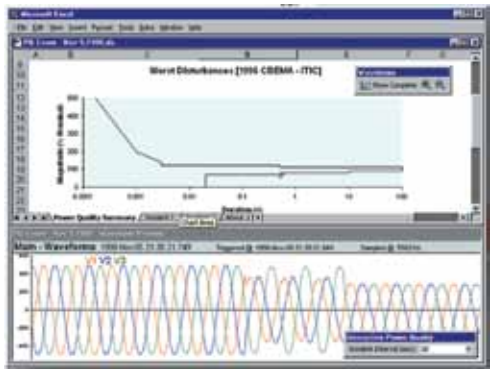
PE86288



PowerLogic™ ION7550 / ION7650 rear view.

1 *Current/voltage inputs*
2 *Digital inputs*
3 *Analogue inputs*
4 *Analogue outputs*
5 *Communications card*
6 *Power supply*
7 *Form C digital outputs*
8 *Digital inputs*
9 *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		■	■
IEC 61850 protocol		■	■
Ethernet port (Modbus/TCP/IP protocol, IEC 61850 (2))		1	1
Ethernet gateway (EtherGate)		1	1
Alarms (optional automatic alarm setting		■	■
Alarm notification via email		■	■
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

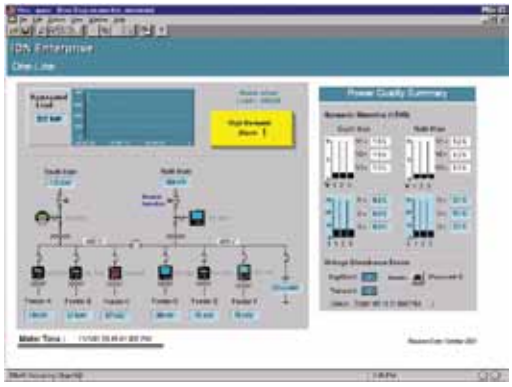
Electrical characteristics		
Type of measurement		True rms to 1024 samples per cycle (ION7650)
Measurement accuracy	Current and voltage	±0.01% of reading + ±0.025% of full scale
	Power	±0.075% of reading + ±0.025% of full scale
	Frequency	±0.005Hz
	Power factor	±0.002 from 0.5 leading to 0.5 lagging
	Energy:	IEC62053-22 0,2S, 1A and 5A
Data update rate		1/2 cycle or 1 second
Input-voltage characteristics	Measurement range	Autoranging 57V through 347V LN / 600V LL
	Impedance	5 MΩ/phase (phase - Vref)
	Frequency measurement range	42 to 69Hz
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 (5A) 50 A rms for 1s, non-recurring (1A)
	Impedance	0.002 Ω per phase (5A) 0.015 Ω per phase (1A)
	Burden	0.05 VA per phase (5 A) 0.015 VA per phase (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.
	Burden	Standard: typical 20 VA, max 45 VA Low voltage DC: typical 15 VA, max 20 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 analogue outputs, and/or 4 analogue 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 +70 °C
	Low voltage DC supply	-20 to +50 °C
	Display operating range	-20 to +60 °C
Storage temperature	Display, TRAN	-40 to +85 °C
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
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, SC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link

***(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

PE86005



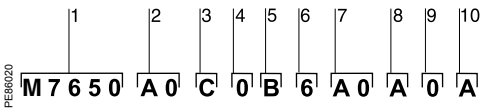
Example showing instantaneous values and alarm.

Communication (cont.)	
Protocol	ION, Modbus, TCP/IP, DNP 3.0, Telnet, IEC 61850(2)
EtherGate	Communicates directly with up to 62 slave devices via available serial ports
ModemGate	Communicates directly with up to 31 slave devices
Ethernet port	10Base-T/100Base-TX, RJ45 connector, 100 m link
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) COMTRADE waveform format available direct from the meter (Ethernet port option only)
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.*

(2) *Only available with 5MB memory meters.*

ION7550 / ION7650
Functions and characteristics (cont.)



Example ION7650 product part number.

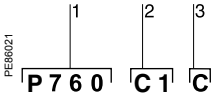
1 *Model.*
2 *Form factor.*
3 *Current Inputs.*
4 *Voltage Inputs.*
5 *Power supply.*
6 *System frequency.*
7 *Communications.*
8 *Inputs/outputs.*
9 *Security.*
10 *Special order.*

Part numbers

	Item	Code	Description
1	Model	M7650	Advanced meter with wide-range voltage inputs (57-347V line-neutral or 100-600V line-line), transient detection, data and waveform recording, IEC 61000-4-30 Class A & EN50160. Supports ION, IEC 61850 (only for meters with 5MB memory and Ethernet comm card) 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. Supports ION, IEC 61850 (only for meters with 5MB memory and Ethernet comm card) Modbus-RTU, and DNP 3.0.
2	Form Factor	A0	Integrated display with front optical port, 5 MB logging memory, and 512 samples/cycle resolution (ION7650) or 256 samples/cycle (ION7550).
		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 (ION7650) or 256 samples/cycle (ION7550).
		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 (ION7650) or 256 samples/cycle (ION7550).
		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 (ION7650) or 256 samples/cycle (ION7550).
		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 / 110-300 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)
		E	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue inputs)
		K	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue outputs)
		N	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue 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 analogue inputs and four -1 to 1 mA analogue 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.)

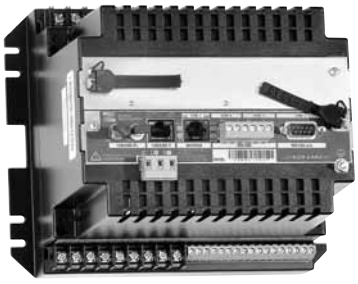
PE86021



Example order code. Use this group of codes when ordering the PowerLogic™ 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	Other options	A	None
		C	Tropicalisation treatment applied
		E	ION7650 only. EN50160 compliance monitoring, IEC61000-4-30 Class A measurements
		F	ION7650 only. EN50160 compliance monitoring, with tropicalisation treatment, IEC61000-4-30 Class A measurements

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. IEC 61850 protocol (depending on firmware version).
		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.IEC 61850 protocol (depending on firmware version).
		E0	Standard communications plus 10Base-T/100Base-TX Ethernet. Ethernet gateway function uses a serial communications port. IEC 61850 protocol (depending on firmware version).
		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. IEC 61850 protocol (depending on firmware version).
		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 analogue inputs
	E	Expansion I/O card with eight digital inputs, four 0 to 20 mA analogue inputs
	H	Expansion I/O card with eight digital inputs, four -1 to 1 mA analogue outputs
	K	Expansion I/O card with eight digital inputs, four 0 to 20 mA analogue outputs
	N	Expansion I/O card with eight digital inputs, four 0 to 20 mA analogue inputs & four 0 to 20 mA outputs
	P	Expansion I/O card with eight digital inputs, four 0 to 1 analogue inputs and four -1 to 1 mA analogue outputs
Special Order	A	None
	C	Tropicalization treatment applied

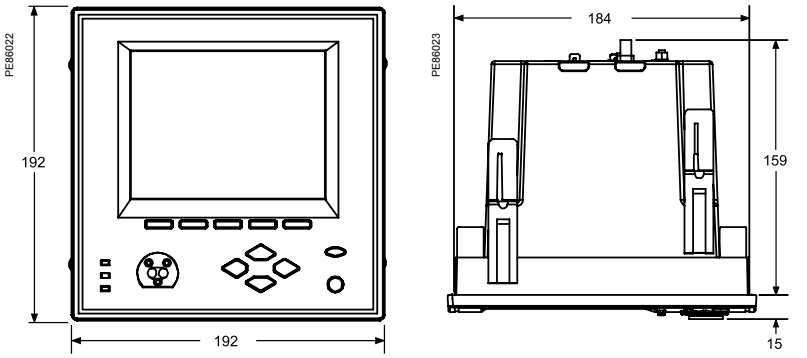
ION7550 / ION7650 related items

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

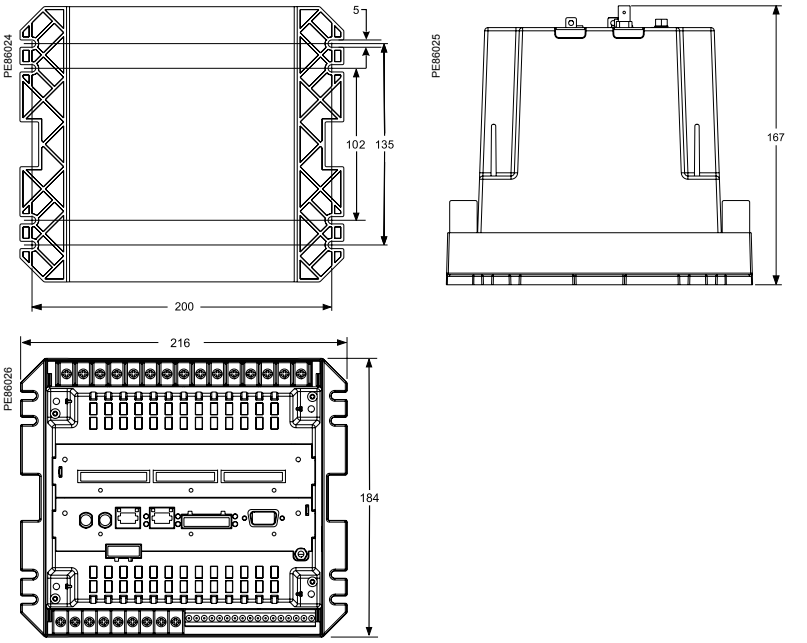
(1) *Firmware version 350 or higher required.*

ION7550 / ION7650
Dimensions and connection

ION7550/ION7650 dimensions

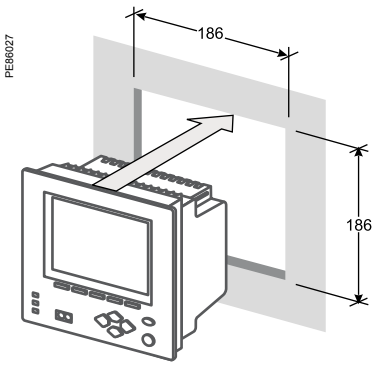


ION7550 / ION7650 TRAN dimensions



Front-panel mounting

ION7550 and ION7650 meter can have integrated or remote display. The meter with integrated display is designed to fit DIN standard 192 cutout (186 mm by 186 mm) . The remote display is intalled through a circular cutout (22.5 mm diameter) at the panel door and it has a front and a back module that is connected to the meter mounted in a DIN rail at the back.



Circuit Monitor Series 4000
Functions and characteristics

PE86140

CM4000 + vacuum fluorescent display (VFD).

The PowerLogic Circuit Monitor Series 4000 offers high-performance digital instrumentation, data acquisition and control capabilities. The products can integrate easily in power monitoring and control systems due to their optional Ethernet connections and embedded web server. They are Transparent Ready.
These devices are designed for applications where power quality and availability are critical factors. They are generally used at service entrances and interconnection points or on circuits feeding sensitive equipment. Due to their very wide range of features, including transient detection (CM4000T only), it is possible to rapidly solve problems related to poor power quality. EN 50160 compliance checking capability makes these products ideal to meet new needs related to market deregulation.
The Circuit Monitor Series 4000 is available in two versions:
- CM4250, with detection of voltage sags, swells and other power quality indices
- CM4000T, with detection of voltage sags and swells together with transient detection and flicker measurements.

Applications
Panel instrumentation.
Sub-billing / cost allocation.
Remote monitoring of an electrical installation.
Extensive power-quality monitoring.
Contract and load curve optimisation.
EN 50160 electrical supply compliance checking.
Metering of other utilities.

Main characteristics
Disturbance direction detection
Indication of whether the source of a specific power quality event is upstream or downstream from the meter.

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

Adaptive waveform capture
Capture of long-duration events.

Shift energy summary
Indication of energy usage per shift up to three shifts a day.

Detection and capture of voltage sags and swells
Fast identification of problems causing production shutdown.

Detection and capture of short transients less than 1 µs (optional, CM4000T only)
Identification of problems due to short disturbances, e.g. switching of capacitors, etc.

Flicker evaluation based on IEC 61000-4-15 and IEEE 1453 (CM4000T only)
Measurement of rapid voltage variations.

Electrical quality checking in compliance with EN 50160
Fast standardised check on the quality of the electricity supplied.

Detection of 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.

Ultra-fast recording of 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.

Automatic alarm setting
Alarm setpoint learning feature for optimum threshold settings.

Up to 32 Mbytes of memory (16 Mbytes standard)
For archiving of data and waveforms.

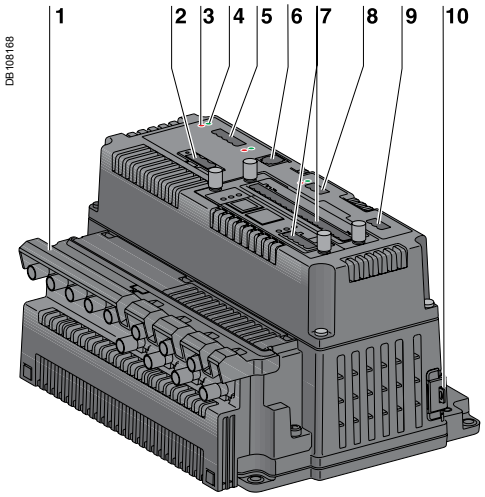
Ethernet 10/100 Mbits/s card and server for HTML pages (with optional Ethernet card)
Rapid data transfers over an intranet or the internet, simply using a web browser.

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

Up to 25 inputs/outputs to monitor the electrical installation (with optional I/O cards)
Status of circuit breakers, as well as metering of other commodities, e.g. gas, water, etc.

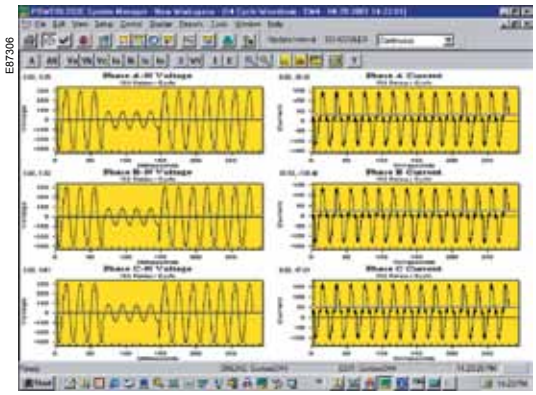
IEC 62053-22 and ANSI C12.20 Class 0.2S for energy
Verification of consumption and load curves.

Circuit Monitor Series 4000
Functions and characteristics (cont.)



CM4000 series.

1 *Current/voltage module.*
2 *Control power-supply connector.*
3 *Maintenance LED indicator.*
4 *Power LED indicator.*
5 *RS 485 port with transmit and receive LED indicators.*
6 *Display communication port.*
7 *Slots for optional cards.*
8 *RS 232 port with transmit and receive LED indicators.*
9 *KYZ pulse output.*
10 *Sealable access door.*



Disturbance waveform capture: detection of a voltage sag.

Part numbers

Circuit Monitor Series 4000	
Circuit Monitor CM4250	**CM4250**
Circuit Monitor CM4000T	**CM4000T**

Selection guide		CM4250	CM4000T
General			
Use on LV and HV systems		■	■
Current and voltage accuracy		0.07 %	0.07 %
Energy and power accuracy		0.2 %	0.2 %
Nbr of samples/cycle or sample frequency		512	5 MHz
Instantaneous rms values			
Current, voltage, frequency		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
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			
Interharmonics		■	-
Harmonic distortion	Current and voltage	■	■
Individual harmonics	Via monitor	63	63
	Via SMS	255	255
Waveform capture		■	■
Detection of voltage swells and sags		■	■
Adaptive waveform capture (up to 64 s)		■	■
Detection and capture of transients (< 1 µs)		-	■
Flicker		-	■
Fast acquisition of 100 ms or cycle by cycle data		■	■
EN 50160 compliance checking (1)		■	■
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		ECC21 option	
SER (Sequence of Event Recording)		■	■
Time stamping		■	■
GPS synchronisation (1 ms)		IOC44 option	
Memory expandable up to		32 Mbytes	32 Mbytes
Display and I/O			
Display		CMDLC or CMDVF option	
Multilingual: English, French, Spanish, German, Italian, Polish		■	■
Wiring self-test		■	■
Pulse output		■	■
Maximum number of I/Os		25	25
Input metering capability (number of channels)		10	10
Direct voltage connection		690 V	600 V
Communication			
RS 485 port		2/4 wires	2/4 wires
RS 232 port		■	■
Modbus protocol		■	■
Ethernet card (Modbus/TCP/IP protocol)		ECC21 option	
HTML-page web server		ECC21 option	
Ethernet gateway for third-party products		ECC21 option	

(1) *Except for interharmonics, signalling voltages, flicker and transients.*

Circuit Monitor Series 4000
Functions and characteristics (cont.)

The Circuit Monitor has two optional display units, an LCD display and a vacuum fluorescent display (VFD). They may be used for local circuit-monitor setup and operation.

PE86143

CMDLC display

Back-lit LCD display with four lines and 20 characters per line. The display unit has four navigation buttons, a contrast button and a red alarm LED.
It connects to the Circuit Monitor via a CAB12 cable, 4.2 metres long, supplied with the display.

Part numbers

LCD display supplied with the CAB12 cable		**CMDLC**
Connection cables: Circuit Monitor <-> display	1.25 m (4 ft)	**CAB4**
	3.65 m (12 ft)	**CAB12**
	9.14 m (30 ft)	**CAB30**

PE86142

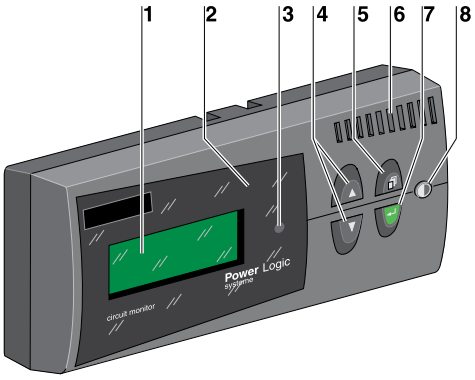
CMDVF display

Vacuum fluorescent display (VFD) with four lines and 20 characters per line.
The display unit has four navigation buttons, a contrast button, a red alarm LED.
The display comes with a cable for connection to the Circuit Monitor (CAB12 cable, 4.2 m long).

Part numbers

VFD supplied with the CAB12 cable		**CMDVF**
Connection cables: Circuit Monitor <-> display	1.25 m (4 ft)	**CAB4**
	3.65 m (12 ft)	**CAB12**
	9.14 m (30 ft)	**CAB30**

E87288



Display.

1 *Display screen.*
2 *Alarm LED.*
3 *Arrow buttons.*
4 *Menu button.*
5 *Proximity sensor (VFD display only).*
6 *Enter button.*
7 *Contrast button.*

Circuit Monitor Series 4000
Functions and characteristics (cont.)

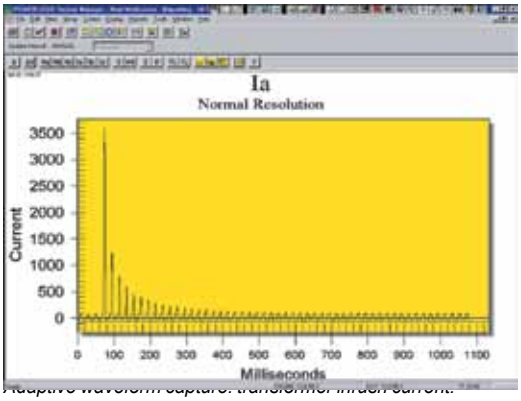
CM4000 + options: ECC21, IOC44 and IOX2411.

Electrical characteristics		
Type of measurement		True rms up to the 255th harmonic On three-phase AC system (3P, 3P + N) Up to 512 samples per cycle Up to 5 MHz for transient events (CM4000T only)
Measurement accuracy	Current and voltage	±0.04 % of reading + ±0.025 % of full scale
	Power	±0.075 % of reading + ±0.025 % of full scale
	Frequency	±0.01 Hz from 45 to 67 Hz ±0.1 Hz from 350 to 450 Hz
	Power factor	±0.002 from 0.5 leading to 0.5 lagging
	Energy: CM4250/CM4000T	IEC 62053-22 and ANSI C12.20 Class 0.2S
Data update rate		1 s in normal mode
Input-voltage characteristics	Measured voltage	0 to 600 V AC on CM4000T (direct) 0 to 690 V AC on CM4250 (direct) 0 to 1200 kV AC (with external VT)
	Measurement range	0 to 1.5 Un
	Impedance	> 2 MΩ
	Frequency measurement range	45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Adjustable from 5 A to 30 000 A
	Measurement range CM4250/CM4000T	5 mA to 10 A
	Permissible overload	15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance	< 0.1 Ω
	Load	< 0.15 VA
Power supply	AC	100 to 275 V AC (±10 %), 50 VA
	DC	125 to 250 V DC (±20 %), 30 W
	Ride-through time	100 ms at 120 V DC
Input/outputs	Pulse output	Static output (240 V AC max, 96 mA max)
	IOC44 card (optional)	4 digital inputs (20-138 V AC/DC), 3 relay outputs (5 A to 240 V AC) 1 static output (96 mA max to 240 V AC)
	IOX extender (optional)	Slots for 8 I/Os
	IOX08 (optional)	8 digital inputs 120 V AC
	IOX0404 (optional) (1)	4 dig. inputs 120 V AC, 4 analogue outputs 4-20 mA
	IOX2411 (optional) (1)	2 dig. outputs 120 V AC, 4 dig. inputs 32 V DC, 1 analogue input 0-5 V, 1 analogue output 4-20 mA
Mechanical characteristics		
Weight		1.9 kg
IP degree of protection (IEC 60529)		IP52
Dimensions CM4250/ CM4000T	Without IOX accessory	235.5 x 165.6 x 133.1 mm
	With IOX accessory	235.5 x 216.3 x 133.1 mm
Environmental conditions		
Operating temperature	Circuit Monitor	-25 °C to +70 °C
	CMDLC display	-20 °C to +60 °C
	CMDVF display	-20 °C to +70 °C
Storage temperature	CM + displays	-40 °C to +85 °C
Humidity rating		5 to 95 % RH at 40 °C
Pollution degree		2
Installation category	CVM42	IV
	CVMT	II
Dielectric withstand		As per EN 61010, UL508, CSA C22.2-2-4-M1987
Electromagnetic compatibility		
Electrostatic discharge		Level 3 (IEC 61000-4-2)
Immunity to radiated fields		Level 3 (IEC 61000-4-3)
Immunity to fast transients		Level 3 (IEC 61000-4-4)
Immunity to impulse waves		Level 4 (IEC 61000-4-5)
Conducted and radiated emissions		CE industrial envir./FCC part 15 class A
Safety		
Europe		CE, as per CEI 61010
USA and Canada		UL508 and CSA C22.2-2-4-M1987

(1) Operating limits: 0° C to +60 °C. Storage limits: -25 °C to +85 °C.

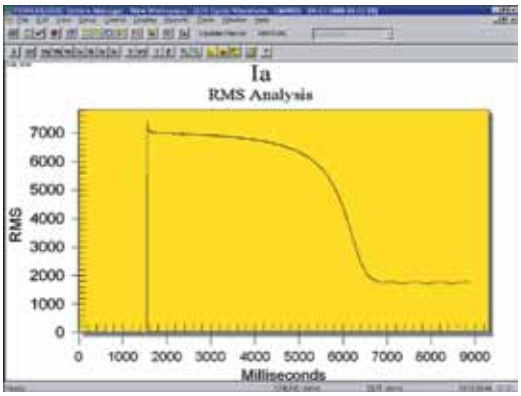
Circuit Monitor Series 4000
Functions and characteristics (cont.)

E87307



Adaptive waveform capture: transformer inrush current.

E87308



Adaptive waveform capture: motor start, rms value.

E87309

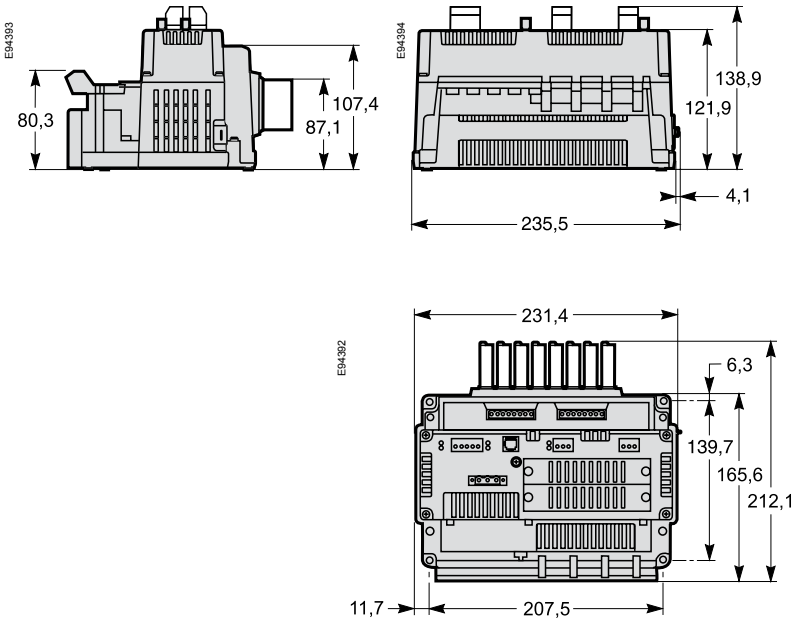
Example CM4250 HTML page showing instantaneous values.

Communication	
RS 485 port (1)	2/4 wires, up to 38400 bauds, Modbus
RS 232 port (1)	Up to 38400 bauds, Modbus, direct connection to a PC or modem
Ethernet ECC21 card with HTML server (optional) (1)	
Copper Ethernet link	10/100 BaseTX, RJ45 connector, 100 m link
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
Protocol	Modbus/TCP/IP
Gateway function for products connected to the ECC21	Master Modbus port, 31 daisy-chained slaves, 63 with repeater, 2/4 wires, 1200 to 38400 bauds, also compatible with the PowerLogic protocol
HTML server	1 standard page, 5 customisable pages
Firmware characteristics	
14 data logs	Up to 96 different parameters, factory-set logs ready to use
One 100 ms data log	Parameters recorded every 100 ms for events
One 20 ms (50 Hz) or 16 ms (60 Hz) data log	Parameters recorded every 20 ms or 16 ms for events
One min/max log	-
One min/max/avg. log	Min/max/avg. values recorded for 23 parameters at regular intervals from 1 to 1440 minutes
One event log	Time stamping to 1 ms, synchro. 1 ms by GPS
Trend curves	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: - every second for one minute for the 1-minute curve - every minute for one hour for the 1-hour curve - every hour for one day for the 1-day curve - every day for one month for the 1-month curve
Forecasting	Forecasting of the values for the eight parameters for the next four hours and next four days
Waveform captures	Standard: manual launch, 1 cycle, 512 samples, 255th harmonic Disturbance: manual launch or by alarm, adjustable from 512 samples/cycle over 28 cycles to 16 samples/cycle over 915 cycles, response time less than 0.5 cycle, number of cycles before alarm settable from 2 to 10 Adaptive: manual launch or by alarm, adjustable from 512 samples/cycle over 8 seconds to 16 samples/cycle over 264 seconds, capture takes place during a set duration or as long as an alarm is active (to save memory), number of cycles before alarm settable from 2 to 10 Transient: voltage sampling at 5 MHz (83 333 samples/cycle) over 2 ms to capture transient peaks < 1 µs
Alarms	Threshold alarms: - adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm - 4 priority levels - 4 response times: standard 1 s, fast 100 ms, disturbance < 1/2 cycle, transient < 1µs - boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR Automatic alarm setting: after a learning phase, the alarm thresholds are set automatically. The alarms will trip in the event of drift with respect to reference values determined during the learning period. Digital alarms: logic input transitions Waveform alarms: alarm tripping by a special algorithm when the current or voltage waveform is distorted beyond an adjustable level. Makes it possible to detect disturbances that cannot be detected by classical threshold alarms (e.g. phase switching).
Memory	8 Mbytes standard, expandable up to 32 Mbytes
Firmware update	Update via the communication ports
Display characteristics	
CMDLC (optional)	Back lit LCD
CMDVF (optional)	Vacuum fluorescent display (VFD) with IR port
Languages	English, French, Spanish, German, Italian, Polish

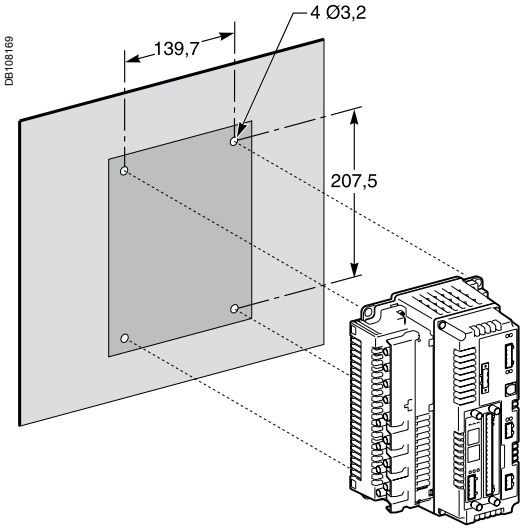
***(1)** All the communication ports may be used simultaneously.*

Circuit Monitor Series 4000
Dimensions and connection

CM4250 / CM4000T dimensions



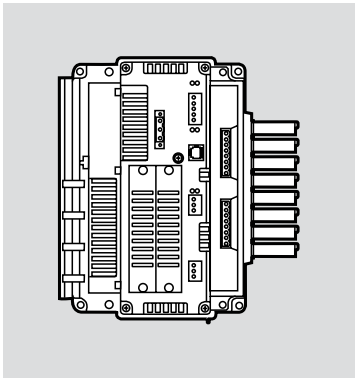
Mounting on a backplate



Circuit Monitor Series 4000
Dimensions and connection

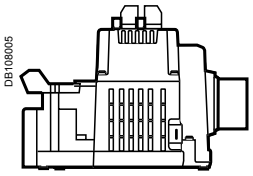
Mounting possibilities

DB108007

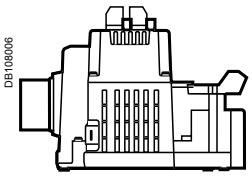


Vertical mounting.

DB108005



DB108006

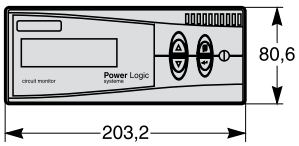


Horizontal mounting.

CMDLC/CMDVF dimensions

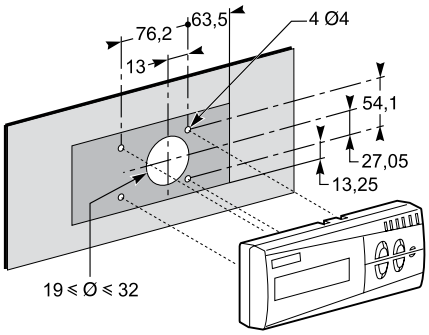
E87286

E87285



Mounting on a backplate

E94377



ION8650
Functions and characteristics

PB107500

PowerLogic ION8650 socket meter

Used to monitor electric energy provider networks, service entrances and substations, PowerLogic ION8650 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 StruxureWare Power Monitoring (ION Enterprise™) operations software or other energy management and SCADA systems through multiple communication channels and protocols, including Itron MV-90, Modbus, DNP, IEC 61850.

Applications

Revenue 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

ANSI Class 0.2 and IEC 62053-22/23 Class 0,2S metering
For interconnection points on medium, high, and ultra-high voltage networks; twice as accurate as current IEC and ANSI Class 0.2 standards over all conditions and including single wide range current measurement.

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

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

Complete communications
Multi-port, multi-protocol ports including serial, infrared, modem and ethernet. Simultaneously supports multiple industry standard protocols including: Itron MV-90, Modbus, Modbus Master, DNP 3.0 and IEC 61850.

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

Multiple setpoints for alarm and functions
Use up to 65 setpoints.

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

ION8650 meters	
ION8650A	**M8650A**
ION8650B	**M8650B**
ION8650C	**M8650C**

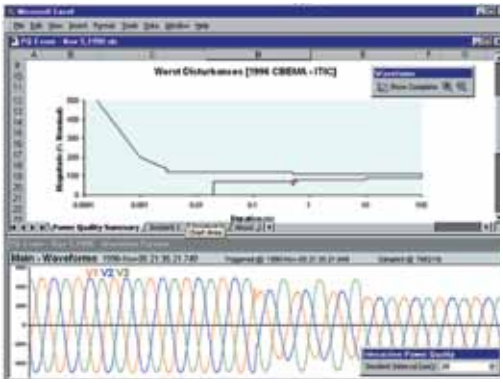
ION8650
Functions and characteristics (cont.)

PE86302-95

PowerLogic ION8650 socket meter.

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

PE86002



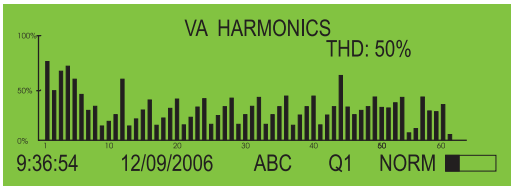
Disturbance waveform capture and power quality report

Selection guide		ION8650 A	ION8650 B	ION8650 C
General				
Use on LV, MV and HV systems		■	■	■
Current accuracy		0.1 %	0.1 %	0.1 %
Voltage accuracy		0.1 %	0.1 %	0.1 %
Power accuracy		0.1 %	0.1 %	0.1 %
Samples/cycle		1024	1024	1024
Instantaneous values				
Current, voltage, frequency		■	■	■
Active, reactive, apparent power	Total & per phase	■	■	■
Power factor	Total & per phase	■	■	■
Current measurement range		0 - 20A	0 - 20A	0 - 20A
Energy values				
Active, reactive, apparent energy		■	■	■
Settable accumulation modes		■	■	■
Demand values				
Current	Present & max. values	■	■	■
Active, reactive, apparent power	Present & max. values	■	■	■
Predicted active, reactive, apparent power		■	■	■
Synchronisation of the measurement window		■	■	■
Demand modes: Block (sliding), thermal (exponential)		■	■	■
Power quality measurements				
Harmonic distortion	Current & voltage	■	■	■
Individual harmonics	Via front panel	63	63	31
Waveform / transient capture		■ / ■	- / ■	- / -
Harmonics: magnitude, phase, and interharmonics		50	40	-
Detection of voltage sags and swells		■	■	■
IEC 61000-4-30 class A / S		A	S	-
IEC 61000-4-15 (Flicker)		■	■	-
High speed data recording (down to 10 ms)		■	■	-
EN50160 compliance reporting		■	■	-
Programmable (logic and math functions)		■	■	■
Data recording				
Onboard Memory (in Mbytes)		128	64	32
Revenue logs		■	■	■
Event logs		■	■	■
Historical logs		■	■	■
Harmonics logs		■	■	■
Sag/swell logs		■	■	■
Transient logs		■	-	-
Time stamping to 1 ms		■	■	■
GPS synchronisation (IRIG-B standard)		■	■	■
Display and I/O				
Front panel display		■	■	■
Wiring self-test (requires PowerLogic ION Setup)		■	■	■
Pulse output (front panel LED)		2	2	2
Digital or analogue inputs(1) (max)		11	11	11
Digital or analogue outputs(1) (max, including pulse output)		16	16	16
Communication				
Infrared port		1	1	1
RS 485 / RS 232 port		1	1	1(3)
RS 485 port		1	1	1(3)
Ethernet port (Modbus/TCP/IP protocol) with gateway		1	1	1(3)
Internal modem with gateway (ModemGate)		1	1	1(3)
HTML web page server		■	■	■
IRIG-B port (unmodulated IRIG B00x time format)		1	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) *With optional I/O Expander.*
(2) *For 9S, and 36S only. For 35S system up to 480V line-to-line.*
(3) *C model limited to IR + 2 other ports at one time. Ports can be enabled/disabled by user.*

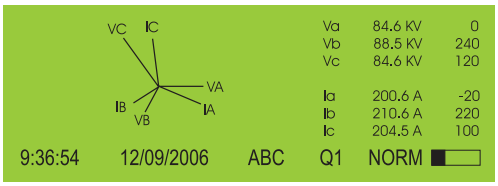
ION8650
Functions and characteristics (cont.)

PE86041



PowerLogic ION8650 front panel harmonic display.

PE86042



ION8650 front panel phasor display and table.

Electrical characteristics		
Type of measurement		True rms 1024 samples per cycle
Measurement accuracy	Current and voltage	0.1 % Reading
	Power	0.1%
	Frequency	±0.001 Hz
	Power factor	0.1%
	Energy	0.1%, twice as accurate as ANSI Class 0.2 and IEC 62053-22/23 (0,2S)
Data update rate		0.5 cycle or 1 second (depending on value)
Input-voltage characteristics (1)	Nominal voltage	57V to 277VLN rms 100V to 480VLL rms (35S)
	Maximum voltage	347 VLN rms, 600 VLL rms (9S)
	Impedance	5 MΩ /phase (phase-Vref/Ground)
	Inputs	V1, V2, V3, VREF
Input-current characteristics	Rated nominal/current class	1A, 2 A, 5 A and/or 10 A (Class 1/2/10/20)
	Accuracy range	0.01 - 20 A (standard range)
	Measurement range	0.001 - 24 A
	Permissible overload	500A rms for 1 second, non-recurring
	Burden per phase	Socket: Typical: 3 W, 8 VA/phase, 3-phase operation; Maximum: 4 W, 11 VA/phase, 3-phase operation Switchboard: 0.05VA at 1A (0.05 Ω max)
Power supply	Standard power supply, blade powered	120-277 VLN RMS (-15%/+20%) 47-63 Hz or 120-480 VLL RMS (-15%/+20%) 47-63 Hz (35S)
	Auxiliary powered low voltage	AC: 65-120 (+/- 15%) VLN RMS, 47-63 Hz DC: 80-160 (+/- 20%) VDC
	Auxiliary powered high voltage	AC: 160-277 (+/- 20%) VLN RMS, 47-63 Hz DC: 200-300 (+/- 20%) VDC
	Ride-through time, (Standard power supply)	Socket: min guaranteed: 6 cycles at nominal frequency (minimun 50 Hz), at 120 V L-N rms (208 V L-L rms) 3-phase operation Switchboard: min guaranteed: `6 cycles at nominal frequency (minimun 50 Hz), at 120 V L-N rms (208 V L-L rms) 3-phase operation
Input/outputs	Digital outputs (Form C)	4 Solid state relays (130 V AC/ 200 V DC) 50 mA AC/DC
	Digital outputs (Form A)	4 Solid state relays (via optional I/O Expander)
	Digital inputs	4 Solid state inputs (via 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
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

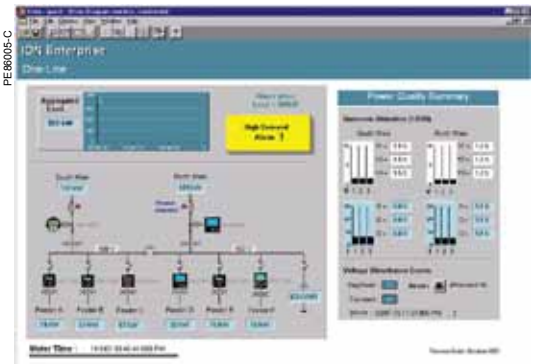
(1) Specifications are limited by the operating range of the power supply if a non-aux power supply is used.

ION8650
Functions and characteristics (cont.)

PE86004-C

Example embedded webserver page (WebMeter) showing realtime values.

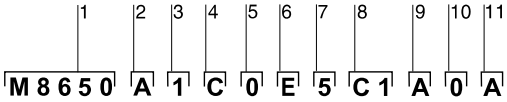
PE86005-C



Communication	
RS 232 / RS 485 port (COM1)	User-selectable RS 232 or RS 485. 300 - 115,200 bauds (RS485 limited to 57,600 bps); protocols: ION, Modbus/RTU/Mastering, DNP 3.0, GPSTRUETIME/DATUM.
Internal modem port (COM2)	300-57,600 bps
ANSI 12.18 Type II optical port (COM3)	Up to 19200 bps
RS 485 port (COM4)	Up to 57,600 bauds, Modbus, direct connection to a PC or modem
Ethernet port	10/100 BaseT, RJ45 connector, protocols: DNP, ION, Modbus/TCP/Mastering, IEC 61850
EtherGate	Up to 31 slave devices via serial ports
ModemGate	Up to 31 slave devices
Firmware characteristics	
High-speed data recording	Up to 1/2-cycle interval burst recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined setpoint, or from external equipment.
Harmonic distortion	Up to 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 measurements with 1s or 1/2 cycle update rate for: - voltage and current - active power (kW) and reactive power (kVAR) - apparent power (kVA) - power factor and frequency - voltage and current unbalance - phase reversal
Load profiling	Channel assignments are user configurable: - 800 channels via 50 data recorders (feature set A), - 720 channels via 45 data recorders (feature set B), - 64 channels via 4 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 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
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	128 Mbytes (A), 64 Mbytes (B), 32 Mbytes (C)
Firmware update	Update via the communication ports
Display characteristics	
Type	FSTN transreflective LCD
Backlight	LED
Languages	English

ION8650
Functions and characteristics (cont.)

PE86043-C



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 *Input/output options.*
10 *Security.*
11 *Special order options.*

PB107507

PowerLogic ION8650 meter with switchboard case

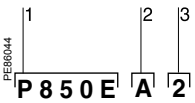
Part Numbers

Item		Code	Description
1	Model	M8650	Schneider Electric energy and power quality meter.
2	Feature Set	A	128MB Memory Class A power quality analysis, waveforms and transient capture with 1024 samples/cycle.
		B	64MB memory, energy meter Class S EN50160 power quality monitoring.
		C	32MB memory, basic tariff/energy metering (4 data recorders, 64 channels).
3	Form Factor (1)	0	Form 9S/29S/36S Base, 57-277 VLN (autoranging) 3-Element, 4-Wire / 2 1/2-Element, 4-Wire
		1	Form 35S Base - 120-480 VLL (autoranging) 2-Element, 3-Wire
		4	Form 9/29/35/36S FT21 Switchboard (meter + case) with break out panel
		7	Form 9/29/35/36S FT21 Switchboard (meter + case) with break out cable
4	Current Inputs	C	1, 2 or 5 Amp nominal, 20 Amp full scale (24 Amp fault capture, start at 0.001 A)
5	Voltage Inputs	0	Standard (see Form Factor above)
6	Power Supply	E	Form 9/29/35/36S, (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.
		H	Auxiliary Power Pigtail: 65-120 VAC or 80-160 VDC (power from external source)
		J	Auxiliary Power Pigtail: 160-277 VAC or 200-300 VDC (power from external source)
7	System Frequency	5	Calibrated for 50 Hz systems.
		6	Calibrated for 60 Hz systems.
8	Communications	A 0	Infrared optical port, RS 232/RS 485 port, RS 485 port
		C 1	Infrared optical port. RS 232/485 port (note this port is not available with feature set C), Ethernet (10BaseT), 56k universal internal modem (RJ11),
		C 7	Infrared optical port, Ethernet (10 BaseT), RS 232/485 port, RS 485 port (note: in addition to infrared optical port, Feature Set C can use any two ports (configurable)), 56k universal internal modem (RJ11)
		E 0	Infrared optical port, RS 485 port (note this port is not available with feature set C) Ethernet (10BaseT), RS 232/485 port,
		E 1	Infrared optical port, Ethernet (10 BaseT), RS 232/485 port, RS 485 port (note: in addition to infrared optical port, Feature Set C can use any two ports (configurable))
		M 1	Infrared optical port, RS 232/485 port, RS 485 port (note: in addition to infrared optical port, Feature Set C can use any two ports (configurable)), 56k universal internal modem (RJ11).
9	Onboard I/O	A	None.
		B	4 Form C digital outputs, 3 Form A digital inputs.
		C	4 Form C digital outputs, 1 Form A digital output, 1 digital input.
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

(1) *Specifications are limited by the operating range of the power supply if a non-aux power supply is used.*

ION8650
Functions and characteristics (cont.)

PE86044



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

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

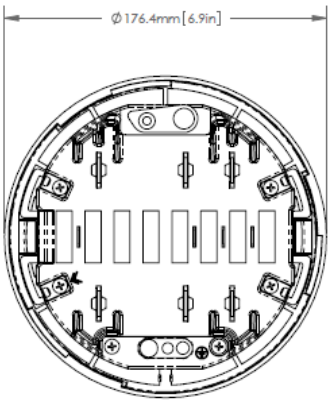
PE86131

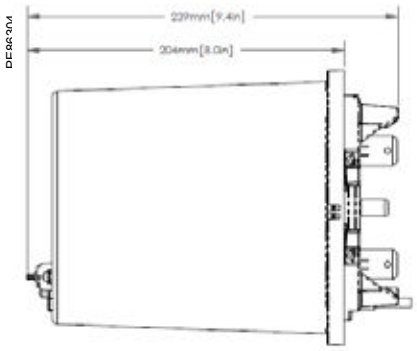
Part numbers (cont.)

I/O Expander		
Digital/Analogue I/O	**P850E**	Schneider Electric I/O Expander for ION8600 meters: Inputs and Outputs for energy pulsing, control, energy counting, status monitoring, and analogue 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 analogue outputs (0 to 20mA)
	C	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analogue outputs (-1mA to 1mA)
	D	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analogue outputs (two -1 to 1 mA, and two 0 to 20 mA outputs)
Cable option	**0**	No cable - cables for the I/O box are no ordered as a separate part number. Refer to part numbers: CBL-8X00IOE5FT, CBL-8X00IOE15FT and CBL-8XX0-BOP-IOBOX under Connector cables, below.
A-base adapters		
A-BASE-ADAPTER-9		Form 9S to Form 9A adapter
A-BASE-ADAPTER-35		Form 35S to Form 35A adapter
Optical communication interface		
OPTICAL-PROBE		Optical communication interface
Connector cables		
CBL-8X00BRKOUT		5' extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin Molex connector on the I/O expander box (not for use with breakout panel E8, F8 & G8 form factors)
CBL-8X00IOE5FT		15' extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin Molex connector on the I/O expander box (not for use with breakout panel E8, F8 & G8 form factors)
CBL-8X00IOE15FT		15' 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		6' connector cable, 24-pin male to 14-pin male Molex connector for connecting an ION8000Series meter with breakout panel to an I/O Expander Box

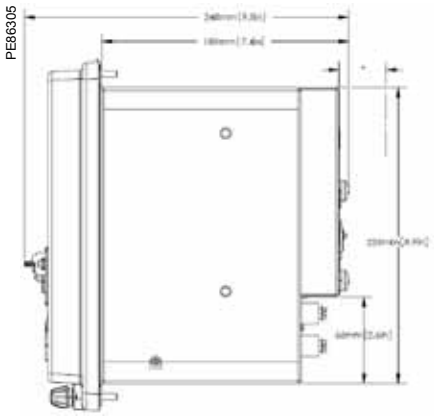
ION8650
Dimensions and connections

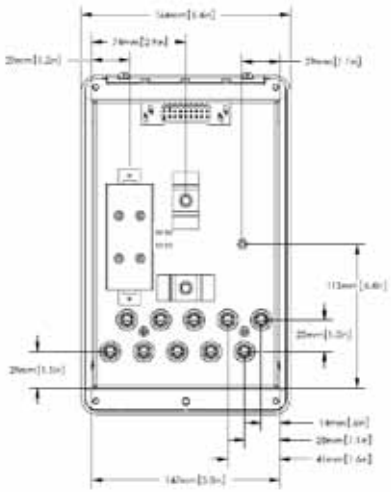
ION8650 socket dimensions



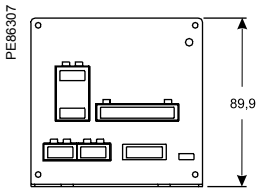


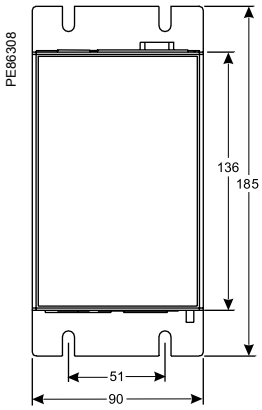
ION8650 switchboard dimensions





I/O Expander dimensions

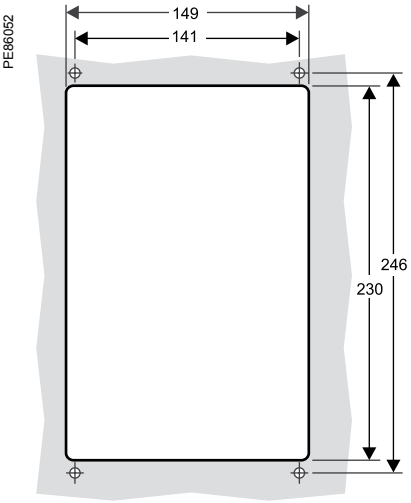




ION8650
Dimensions and connections (cont.)

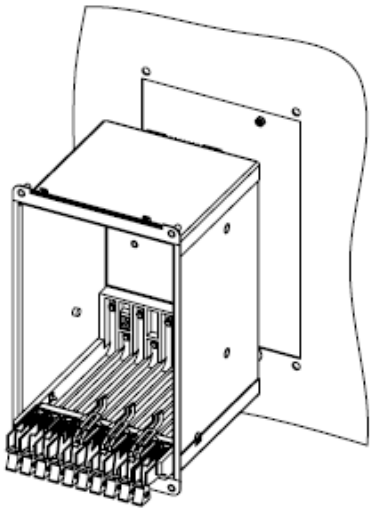
ION8650 suggested switchboard mounting dimensions

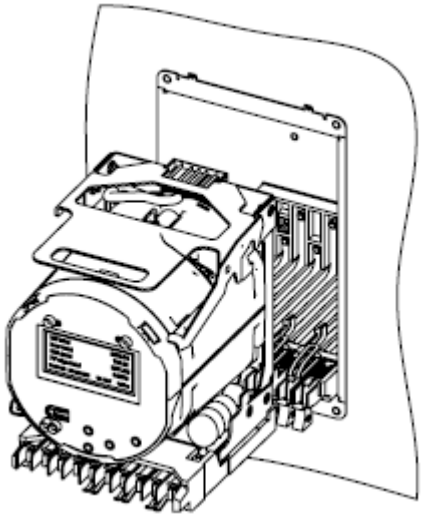
PE86052



ION8650 switchboard mounting

PE86309





ION8800
Functions and characteristics

PE86176

PowerLogic™ ION8800 meter

Providing high accuracy and a wide range of features for transmission and distribution metering, the PowerLogic ION8800 advanced revenue and power quality meter has the flexibility to change along with your needs. The meter provides the tools necessary to:
- manage energy procurement and supply contracts
- perform network capacity planning and stability analysis'
- monitor power quality compliance, supply agreements, and regulatory requirements.

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

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

Main characteristics

IEC 19-inch rack mount design to DIN 43862 standard
Use Essailec connectors with common measurement and energy pulsing pin-out to easily retrofit into existing systems.

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

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

Power quality summary
Consolidate power quality characteristics into easily viewable reports indices.

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

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

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

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

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

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

Transformer/line loss compensation
Compensate for system losses in real time directly in the meter.

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

Part numbers(1)

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

(1) Representative part numbers only. See page 120 for complete part number descriptions.

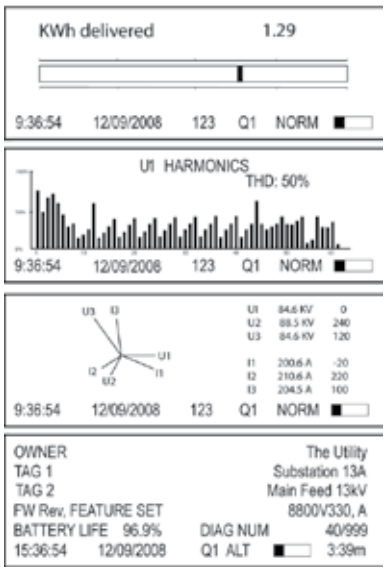
ION8800
Functions and characteristics (cont.)

PE86001

PowerLogic ION8800 meter

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

PE86235



Display screen examples: KWh disk simulator, voltage harmonics histogram, phasor diagram, and name plate1.

Selection guide		ION8800A ION8800B	ION8800C
General			
Use on LV, MV and HV systems		■	■
Current accuracy		0.1 %	0.1 %
Voltage accuracy		0.1 %	0.1 %
Power accuracy		0.2 %	0.2 %
Samples/cycle		1024	1024
Instantaneous rms values			
Current, voltage, frequency (Class 0,2S)		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Current measurement range		0.001 - 10A	0.001 - 10A
Current measurement range		0.001 - 10A	0.001 - 10A
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current		■	■
Active, reactive, apparent		■	■
Predicted active, reactive, apparent		■	■
Demand modes (block, sliding, thermal, predicted)		■	■
Power quality measurements			
Detection of voltage dips (sags) and swells		10 ms	10 ms
Symmetrical components: zero, positive, negative		■	-
Transient detection, microseconds (50 Hz)		20 (1)	20 (1)
Harmonics: individual, even, odd, total up to		63rd	63rd
Harmonics: magnitude, phase and inter-harmonics		50th	40th
EN 50160 compliance		■	
IEC 61000-4-30 class A		■	
IEC 61000-4-30 class S		■ (2)	
IEC 61000-4-15 (Flicker)		■	-
Configurable for IEEE 519 - 1992, IEEE1159-1995		■(1)	-
Programmable (logic and math functions)		■	■
Data recording			
Min/max logging for any parameter		■	■
Historical logs	Maximum # of records	800(1) 640(2)	32
Waveform logs	Maximum # of records	96 (1)	-
Timestamp resolution in seconds		0.001	0.001
Setpoints, minimum response time		½ cycle	½ cycle
Number of setpoints		65	65
GPS time synchronisation (IRIG-B)		■	■
Could add transient logs. COMTRADE fault records.		■	■
User configurable log memory		10 Mbytes	10 Mbytes
Display and I/O			
Front panel display		■	■
Active/reactive energy pulser, LED and IEC 1107 style port		■	■
Digital pulse outputs, optional	Solid state Form A	8	8
Digital pulse outputs	Solid state Form C	4	4
Alarm relay output	Form C	1	1
Digital inputs (optional)		3	3
Communications			
RS 232/485 port		1	1
RS 485 port		1	1
Ethernet port		1	1
IEC 1107 optical port		1	1
Internal modem		1	1
3-port DNP 3.0 through serial, modem, Ethernet and I/R ports		■	■
Modbus RTU master / slave (serial, modem and I/R ports)		■ / ■	- / ■
Modbus TCP master / slave (via Ethernet port)		■ / ■	- / ■
Data transfer between Ethernet and RS 485 (EtherGate)		■	■
Data transfer between internal modem, RS 485 (ModemGate)		■	■
Alarms, single or multi-condition		■	■
Alarm notification & logged data via email		■	■
Embedded web server (WebMeter)		■	■

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

ION8800
Functions and characteristics (cont.)

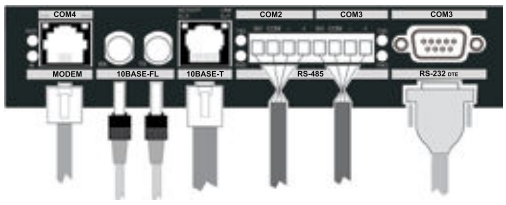
PE86003

PowerLogic ION8800 with optional communications module.

Electrical characteristics		
Type of measurement		True rms 1024 samples per cycle
Measurement accuracy	Current and voltage	0.1 %
	Power	0.2 %
	Frequency	±0.005 Hz
	Power factor	0.1%
	Energy	IEC 62053-22/23 Class 0.2 S
Data update rate		½ cycle or 1 second
Input-voltage characteristics	Inputs	U1, U2, U3, Uref
	Measurement range	57-288 LN VAC rms (99-500 LL VAC rms)
	Dielectic withstand	3320 VAC rms
	Impedance	5 MΩ /phase (phase-Uref/Ground)
Input-current characteristics	Rated nominals	5 A, 1 A, 2 A
	Permissible overload	200A rms for 0.5s, non-recurring (IEC 62053-22)
	Impedance	10 mΩ /phase
	Burden	0.01 VA per phase (1A), 0.25 VA per phase (5 A)
Power supply	AC	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)
	Dielectric withstand	2000 VAC
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		
Mounting location		Indoor
Maximum altitude		2000 m above sea level
Limit range of operation		-25°C to +70°C
Specified operating temperature		-10°C to +45°C (as per 62052-11)
Display operating range		-10°C to +60°C
Storage temperature		-25°C to +70°C
Humidity rating		5 to 95 % RH non-condensing
Pollution degree		2
Installation category		**Power supply (II) Metering inputs (III)**
Electromagnetic compatibility		
Electrostatic discharge		IEC 61000-4-2
Immunity to radiated fields		IEC 61000-4-3
Immunity to fast transients		IEC 61000-4-4
Immunity to surge waves		IEC 61000-4-5
Conducted immunity		IEC 61000-4-6
Damped oscillatory waves immunity		IEC 61000-4-12
Conducted and radiated emissions		CISPR 22 (class B)
Safety		
Europe		As per IEC 62052-11
International		As per IEC 60950
Utility approval		
EGR, GOST, ESKOM, NMI		

ION8800
Functions and characteristics (cont.)

PE86234

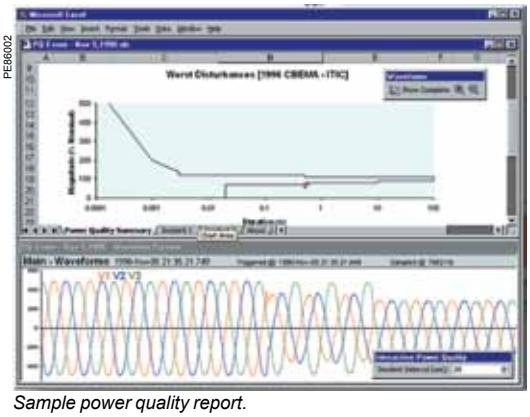


Ports on the optional communications module.

PE86233

showing

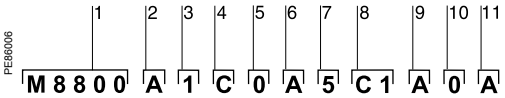
PE86002



Sample power quality report.

Communication	
IEC 1107 optical port	2/4 wires, up to 19200 bauds
RS 485 port	Up to 57600 bauds, direct connection to a PC or modem, protocols: ION, Modbus RTU, Modbus Master, DNP 3.0, GPSTRUETIME/DATUM, DLMS
Communications module (optional)	
RS 232/485 port	300 - 115,200 bauds (RS 485 limited to 57,600 bauds); protocols: same as RS 485 port
Internal modem port	300 bauds - 56000 bauds, RJ11 connector
Ethernet port	10 BaseT, RJ45 connector, 100 m link; protocols: DNP TCP, ION, Modbus TCP, Modbus Master, IEC 61850
Fiber-optic Ethernet link	10 Base FL, ST connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link; protocols: same as Ethernet port
EtherGate	Communicates directly with up to 62 slave devices via available serial ports
ModemGate	Communicates directly with up to 31 slave devices
Firmware characteristics	
High-speed data recording	Up to 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 measurements with 1s or 1/2 cycle update rate for: - voltage and current - active power (kW) and reactive power (kvar) - apparent power (kVA) - power factor and frequency - voltage and current unbalance - phase reversal
Load profiling	Channel assignments (800 channels via 50 data recorders) are configurable for any 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 energy and power quality meter.
2 Feature Set	A	Class A power quality analysis, waveforms and transient capture with 1024 samples/cycle.
	B	Energy meter Class S EN50160 power quality monitoring.
	C	Basic tariff/energy revenue meter with sag/swell monitoring.
3 Memory/Form Factor	1	10 MB logging memory, Essailec connectors.
	2	5 MB logging memory, Essailec connectors, with IEC61850 protocol
4 Current Inputs	C	(I1-I3): Configured for 5 A nominal, 10 A full scale, 14 A fault capture, 0.001 A starting current.
	E	(I1-I3): Configured for 1 A nominal, 10 A full scale, 14 A fault capture, 0.001 A starting current.
5 Voltage Inputs	0	(V1-V3): Autoranging (57-288 VAC L-N or 99-500 VAC L-L)
6 Power Supply	B	Single phase power supply: 85-240 VAC ±10% (47-63 Hz) or 110-270 VDC.
7 System Frequency	5	Calibrated for 50 Hz systems.
	6	Calibrated for 60 Hz systems.
8 Communications module (field serviceable)	Z0	No communications module - meter includes Base Onboard I/O and comms (see below for details).
	A0	Standard communications: 1 RS 232/RS 485 port, 1 RS 485 port (COM2) (1).
	C1	Standard communications plus 10Base-T Ethernet (RJ45), 56 k universal internal modem (RJ11).
	D1	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL Ethernet Fiber, 56 k universal internal modem (RJ11).
	E0	Standard communications plus 10Base-T Ethernet (RJ45).
	F0	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL (ST male Fiber Optic connection).
	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

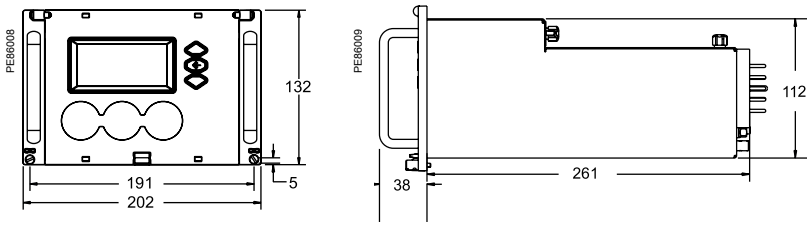
Item	Code	Description
P880C	A0	Standard communications: 1 RS-232/RS-485 port, 1 RS-485 port (COM2)(1).
	C1	Standard communications plus 10Base-T Ethernet (RJ45), 56k universal internal modem (RJ11).
	D1	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL Ethernet Fiber, 56k universal internal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

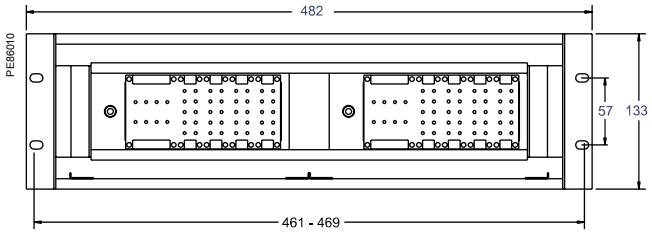
Note: *The part number above should conform to the following format: P880C A0 A.*

ION8800
Dimensions and connections

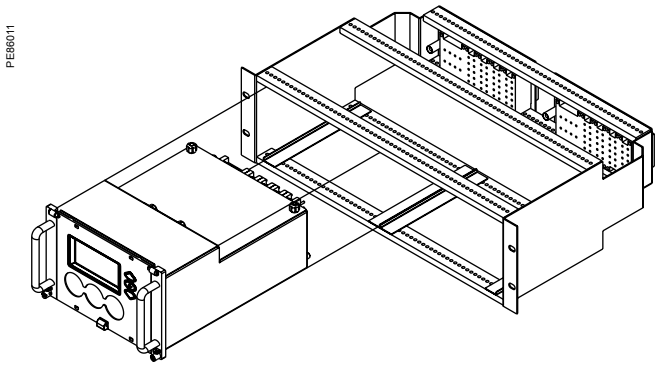
ION8800 dimensions



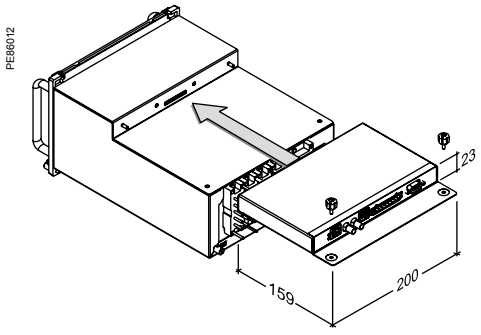
ION8800 Essailec rack dimensions



Rack mounting the ION8800



ION8800 communication module dimensions



Communication interfaces and associated services

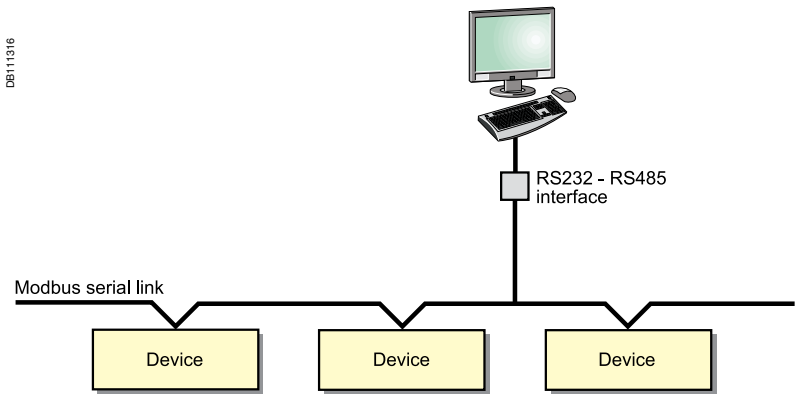
Switchboard-data acquisition and monitoring make it possible to anticipate events. In this way, they reduce customer costs in terms of operation, maintenance and investment.

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.

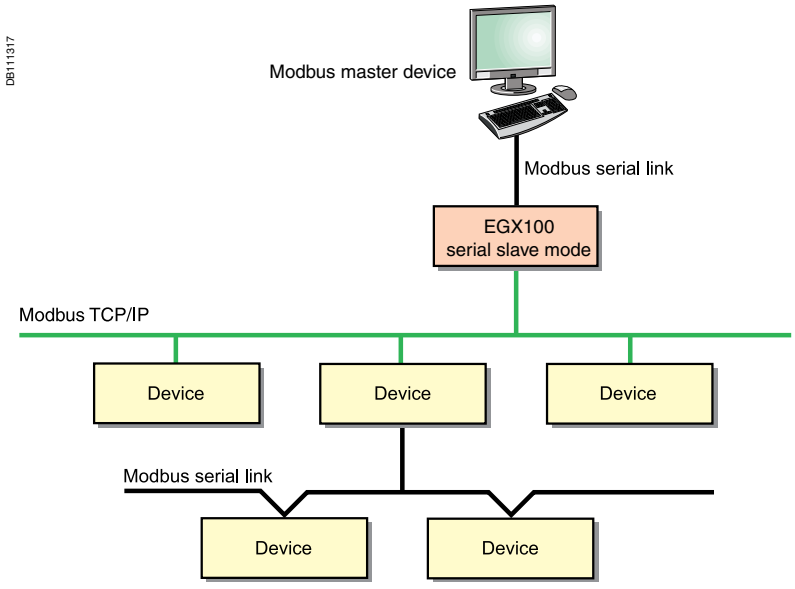
In all architectures, the communication interface serves as the link between the installation devices and the PC running the operating software. It provides the physical link and protocol adaptation. Adaptation is required because the communication systems used by the PC (Modbus via RS232 and/or Ethernet) 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.



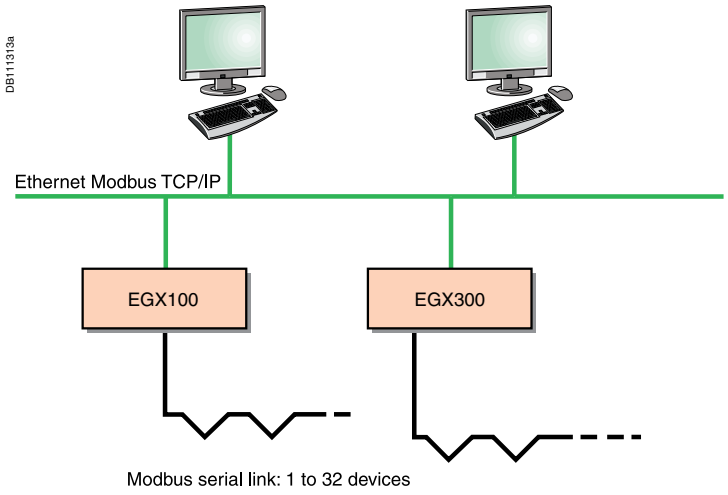
Modbus communication across Ethernet network

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 (StuxureWare Power Monitoring Expert and StruxureWare PowerSCADA Expert), running on a PC, provide broader coverage for more specific needs.

Energy Server Com'X 200
Functions and characteristics

Energy Server Com'X 200

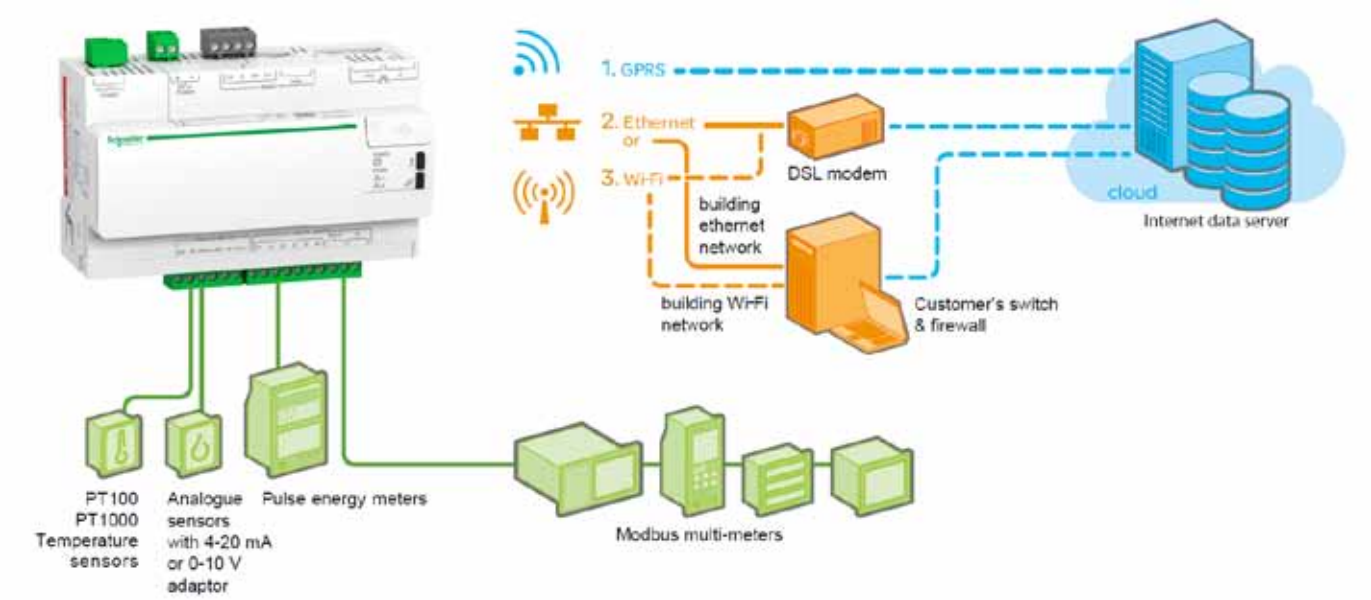
Ethernet GPRS data logger function
The Energy Server Com'X 200 collects and stores WAGES consumptions (Water, Air, Gas, Electricity, Steam) and environmental parameters such as temperatures, humidity, and CO2 levels in a building. Data is periodically transmitted as a report to an Internet database server.

Data processing and display
Once received by the server, the data is ready to be processed and displayed as web pages through web services provided by Schneider Electric, such as StruxureWare Energy Operation and StruxureWare Energy On Line.

- Energy Operation
- Energy Online

or by any private energy management platform.

Architecture
Access to the web: choice of 3 media



Features
- From a simple metering installation with 1 device to large metering systems, Com'X 200 collects data from any Modbus TCP or serial devices, from any pulse meters, actuators and analogue sensors
- Automatic discovery of connected Modbus devices
- Connectivity to the cloud through Ethernet, Wi-Fi and GPRS
- 2 Ethernet ports to separate upstream cloud connection from field devices network
- Protocols: HTTP, HTTPS, FTP, SMTP with Proxy management
- Data export: Native connection to Schneider Electric Service platforms (Energy Operation, Energy Online)– CSV file export for other database servers
- Setup through convenient built-in web pages
- Compliant with electrical switchboard environment (Temperature , electro magnetic compatibility)
- Storage of data in case of communication failure
- Local backup of the configuration parameters

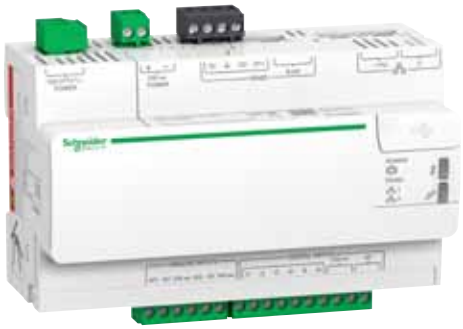
When associated with SE Services:
- Remotely managed (firmware upgrade, configuration backup, troubleshooting, parameters setting
- GPRS contract management with SIM card provided

Part Numbers

Energy Server Com'X 200	
Com'X 200 Ethernet data logger	EBX200
Wi-Fi USB stick	EBXA-USB-WiFi
GPRS modem with SIM card	EBXA-GPRS-SIM
GPRS modem without SIM card	EBXA-GPRS
External GPRS antenna	EBXA-ANT-5M

Energy Server Com'X 200
Functions and characteristics (cont.)

PB112041



Energy Server Com'X 200

PB112050

Energy Server Com'X 200 with the front face in Open position, GPRS modem and Wi-Fi USB stick are connected.

PB112042

GPRS modem (antenna in folded position)

440800021

External GPRS antenna

Ethernet GPRS data logger

Characteristics		
Inputs		
6 Digital inputs		
	Max impulse frequency	25 Hz (min duration 20ms) IEC 62053-31 Class A
	Power Supply	Provided by Com'X 200: 12 V DC – 60 mA External: from 10 to 30 V DC
2 Analogue inputs		
	Sensor compatibility	PT100 – PT1000 2-wires probes (accuracy 1%) Sensors with 4 -20 mA or 0-10 V output (accuracy 0.5%)
	Power supply	Provided by Com'X 200: 24 V DC - 50 mA per input
Communication		
Meter Network		1 RS485 Modbus serial port, RJ45 connector, for 32 Modbus components maximum
Configuration / Data transfer		2 Ethernet ports RJ45 10/100 Base, DPWS ready
	Ethernet 1	PoE class 3 (802.3af), DHCP client
	Ethernet 2	DHCP client or server
	Protocols	IPv4, IPv6 – HTTP, HTTPS, Modbus TCP/IP
USB Ports		2
	For memory stick	USB port on front face
	For Wi-Fi stick	USB port 2 behind cover
LED indicators		11
		Power/ Boot status
		GPRS modem status and signal level
		Modbus communication
		Ethernet communication
		Wi-Fi communication mode (Access point / Infrastructure) and status
		Digital inputs status and pulse reception
Power Supply		
AC		100-277 V (+/- 15%)(50-60Hz)
DC		24 V (+/- 10%)
Max power		26 W max
Mechanical		
IP		Front face IP40, terminals IP20
Dimensions (HxWxD)		91 x 144 x 65.8 mm
Weight		450 g
Environment		
Operating temperature		-25 to +70°C (-13 to +158°F)
Storage temperature		-40 to +85°C (-40 to +185°F)
Humidity		5 to 95% relative humidity (without condensation) at +55ºC
Pollution		Class III
Safety standards / regulation		
International (CB scheme)		IEC 60950
USA		UL508/UL60950
Canada		cUL (complies with CSA C22.2, no. 60950)
Europe		EN 60950
Quality Brands		
		CE, UL

PB112044

Wi-Fi USB stick

PowerLogic EGX100
Ethernet gateway

PE86138

PowerLogic EGX100

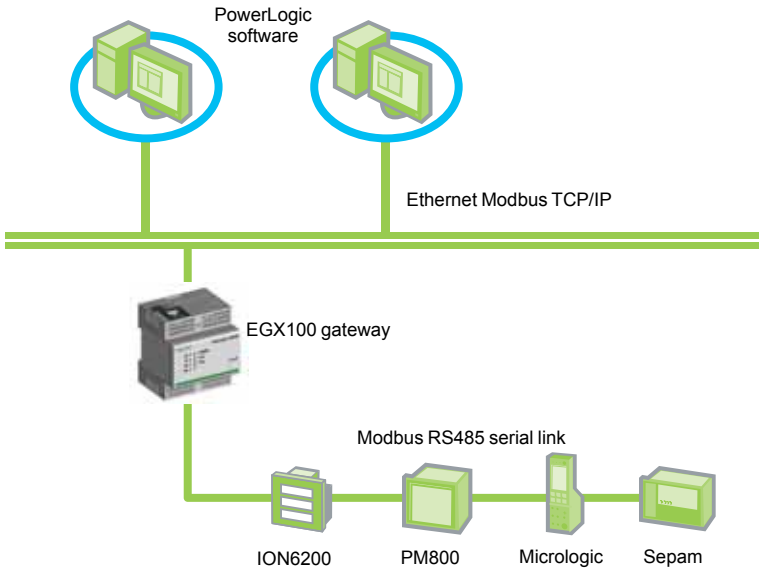
Function

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:
StruxureWare Power Monitoring Expert software
StruxureWare PowerSCADA Expert.

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 the EGX gateway
specifies the language used for the setup session.

Part numbers

Powerlogic EGX100	Schneider Electric
EGX100	**EGX100MG**

PowerLogic EGX100
Ethernet gateway (cont'd)

PE86138

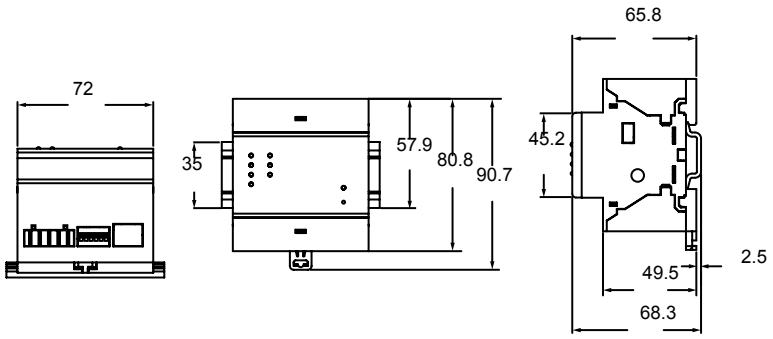
PowerLogic EGX100

Characteristics

	EGX100
Weight	170 g
Dimensions (HxWxD)	80.8 x 72 x 65.8 mm
Mounting	Din rail
Power-over-Ethernet (PoE)	Class 3
Power supply	24 V DC if not using PoE
Maximum burden	4 W
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:	
electrostatic discharge	EN 61000-6-2
radiated RF	EN 61000-4-2
electrical fast transients	EN 61000-4-3
surge	EN 61000-4-4
conducted RF	EN 61000-4-5
power frequency	EN 61000-4-6
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 connected devices	32 (directly) 247 (indirectly)
Ethernet port	
Number of ports	1
Type of port	10/100 Base TX (802.3af) port
Protocol	HTTP, Modbus TCP/IP, FTP, SNMP (MIB II)

Installation

Din rail mounting



ION7550 RTU
Functions and characteristics

PE86117

PowerLogic ION 7550 RTU.

The PowerLogic ION7550 RTU (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 ION7550 RTU offers a seamless, end-to-end WAGES metering solution. Featuring a large, high-visibility display and overall versatility of the PowerLogic system, the ION7550 RTU provides extensive analogue 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 ION7550 RTU 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.

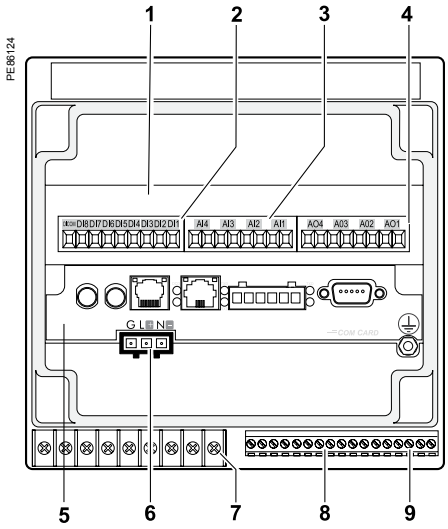
Modbus Master functionality
Aggregate and store data from downstream Modbus devices using serial or Ethernet connections.

Part numbers

ION7550 RTU	
ION7550	**M7550**

See page 133 for order code explanations.

ION7550 RTU
Functions and characteristics (cont.)



PowerLogic® ION7550 RTU.

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

Selection guide	ION7550 RTU
Data recording	
Min/max of instantaneous values	
Data logs	
Event logs	
Trending	
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 TCP Master / Slave (Ethernet port)	
Modbus RTU Master / Slave (Serial port)	
Ethernet port (Modbus/TCP/IP protocol)	1
Ethernet gateway (EtherGate)	1
Alarms (optional automatic alarm setting	β
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	

ION7550 RTU
Functions and characteristics (cont.)

PE86117

PowerLogic ION7550 RTU.

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 analogue outputs, and/or 4 analogue 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.

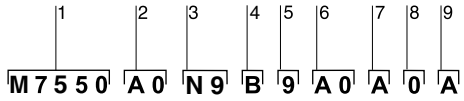
ION7550 RTU
Functions and characteristics (cont.)

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, Modbus Master, 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.

ION7550 RTU
Functions and characteristics (cont.)

PE86118

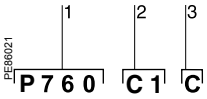


Sample ION7550 RTU part number.

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 analogue inputs)
		E	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue inputs)
		H	Standard I/O plus Expansion I/O card (8 additional digital inputs & four -1 to 1 mA analogue outputs)
		K	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue outputs)
		N	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue 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 analogue inputs and four -1 to 1 mA analogue
8	Security	0	Password protected, no hardware lock
9	Special Order	A	None
		C	Tropicalisation treatment applied

ION7550 RTU
Functions and characteristics (cont.)



Example order code. Use this group of codes when ordering the PowerLogic ION7550 RTU 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	ION7550 RTU 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

ION7550 RTU
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 analogue inputs
	E	Expansion I/O card with eight digital inputs, four 0 to 20 mA analogue inputs
	H	Expansion I/O card with eight digital inputs, four -1 to 1 mA analogue outputs
	K	Expansion I/O card with eight digital inputs, four 0 to 20 mA analogue outputs
	N	Expansion I/O card with eight digital inputs, four 0 to 20 mA analogue inputs & four 0 to 20 mA outputs
	P	Expansion I/O card with eight digital inputs, four 0 to 1 analogue inputs and four -1 to 1 mA analogue outputs
Special Order	A	None
	C	Tropicalization treatment applied

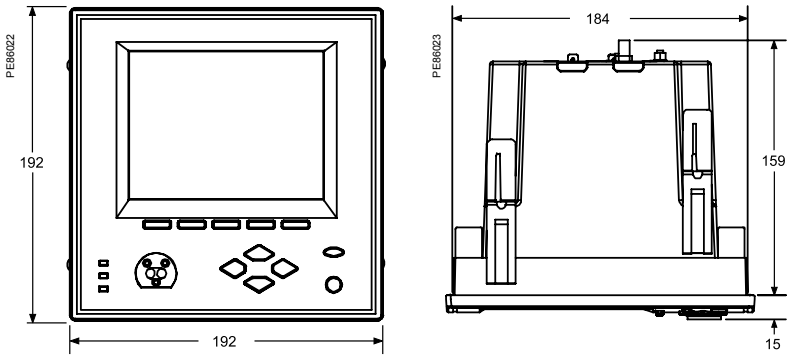
OpenDAC rack, controllers, power supply	
70LRCK16-48	OpenDAC rack. Holds up to 8 OpenLine modules to provide up to 16 I/O points. Requires communications controller
72-MOD-4000	OpenDAC OpenDAC RS-485 serial module. Communications controller for use in a Modbus RTU network. Supports up to 2 70LRCK16-48 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

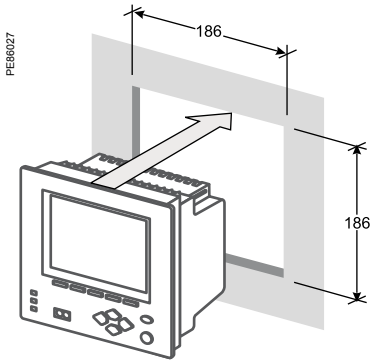
OpenLine analogue I/O modules	
73L-II020	analogue input, current, 0-20mA
73L-II420	analogue input, current, 4-20mA
73L-ITCJ	analogue input, temperature, J-type TC
73L-ITCK	analogue input, temperature, K-type TC
73L-ITCT	analogue input, temperature, T-type TC
73L-ITR100	analogue input, temperature, RTD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

ION7550 RTU
Dimensions and connection

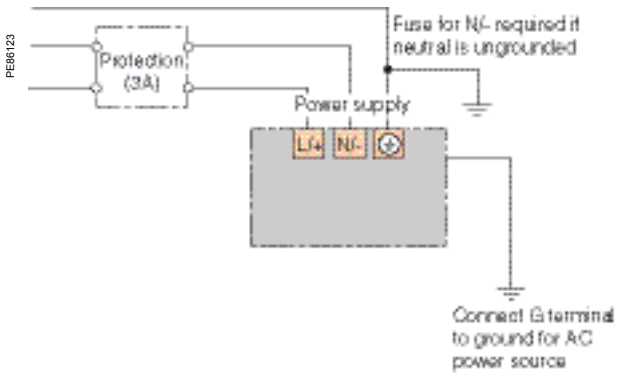
ION7550 RTU dimensions



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.*

Software introduction and comparison

PE86230

StruxureWare software

PE86202

StruxureWare Power Monitoring Expert software

PE86231

StruxureWare PowerSCADA Expert monitoring and control software

A choice of powerful, effective solutions

StruxureWare software offerings give you desktop access to your entire electrical network. They convert energy-related data into timely, actionable information and give you the control to act on your decisions. The depth of different offerings makes it easy to match a product to your goals, your business and your budget.

□ **StruxureWare Power Monitoring Expert** software is a complete power management solution that helps you maximise energy efficiency, cut energy-related costs and avoid power-quality related equipment failures and downtime.

□ **StruxureWare PowerSCADA Expert** software is a power monitoring and control solution with high reliability and performance for helping reduce the risk of power outages and increase network-wide efficiency.

Extensive reach and flexibility

StruxureWare software forms an important part of your overall energy efficiency and reliability solutions from Schneider Electric. A PowerLogic system can grow with your business, giving you the level of energy intelligence and control you need to reduce energy consumption and costs, minimise environmental impacts, and assure power availability, uptime and safety.

Each product collects energy-related data from a variety of sources, including PowerLogic or third-party meters and sensors. Some products offer integration with other Schneider Electric or third-party automation systems, and other energy-relevant information feeds.

Choosing your solution

This section provides a brief overview of the types of environments and applications each software offer is best suited for. See the following product sections for more detail on specific product features and compatibilities. Your Schneider Electric representative can help you design the best solution by choosing the best product and associated services for your needs.

Software	Environment					Application category		
	Industry	Buildings	Data centres	Infra-structure	Electric utilities	Energy efficiency & cost	Power availability & reliability	Network protection & control
StruxureWare Power Monitoring Expert	■	■	■	■	■	■■■	■■■■	■
StruxureWare PowerSCADA Expert	■		■	■	■		■■	■■■■

The number of square bullets *indicates the relative strength of feature set for the noted application category.*

Software introduction and comparison

Applications for industry, buildings, data centres and infrastructure

Category		Application	StruxureWare Power Monitoring Expert	StruxureWare PowerSCADA Expert
	Energy efficiency & cost	Energy usage analysis	■■	■
		Cost allocation	■	
		Procurement optimisation	■	
		Peak demand reduction	■■■	■■
		Demand response and curtailment	■■■	■■
		Power factor correction	■■■	
	Power availability & reliability	Electrical distribution (ED) asset optimisation	■■■	■
		Power quality analysis and compliance	■■■	■
		ED commissioning, monitoring, and troubleshooting	■■■■	■■■
		ED alarming and events	■■■	■■■
	Network protection & control	ED automation and control	■■	■■■■
		Load management and shedding	■	■
		Redundancy		■■■■
		High reliability and time performance		■■■■

The number of square bullets *indicates the relative strength of feature set for the noted application.*

Applications for electric utilities

Category		Application	StruxureWare Power Monitoring Expert	StruxureWare PowerSCADA Expert
	Power availability & reliability	Power quality analysis and compliance	■■■	
		Electrical distribution (ED) commissioning, monitoring and troubleshooting	■	■■■■
		ED alarming and events	■■	■■■
	Network protection & control	ED automation and control	■	■■■■
		Load management and shedding	■	■■
		Redundancy		■■■■
		High reliability and time performance		■■■■

The number of square bullets *indicates the relative strength of feature set for the noted application.*

StruxureWare Power Monitoring 7 (PowerLogic ION Enterprise™)
Functions and characteristics

EB100263

StruxureWare Power Monitoring dashboard (sample)

StruxureWare Power Monitoring is an operations-level supervisory software that provides a complete power management solution for industry, large commercial and institutional buildings, data centres, healthcare facilities, and utilities. Engineering and management personnel can cut energy-related costs, avoid downtime, and optimise equipment operations by using the information provided by StruxureWare Power Monitoring software.

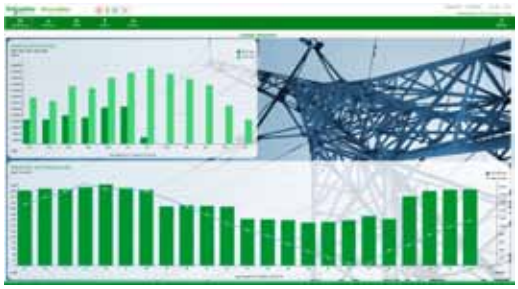
StruxureWare Power Monitoring also enables tracking of real-time power conditions, analysis of power quality and reliability, and quick response to alarms to avoid critical situations. The software forms a layer of energy intelligence across your facility, campus or service area, acting as a unified interface to all electrical and piped utilities.

Typical applications

StruxureWare Power Monitoring software has many applications:
- Monitor the facility electrical network and verify reliable operation
- Improve response to power-related events and restore operations quickly
- Analyze and isolate the source of power quality problems
- Analyze energy use to identify waste and reduce cost
- Estimate utility bills to verify accuracy and identify errors
- Allocate energy costs to departments to drive accountability and awareness
- Reduce peak demand surcharges and power factor penalties
- Idenfity excess capacity in existing infrastructure and avoid over-building
- Support proactive maintenance to prolong asset life.

For electric utilities:
- Improve T&D network reliability
- Enhance substation automation
- Maximise the use of existing infrastructure
- Verify compliance with new power quality standards
- Analyse and isolate the source of power quality problems
- Help customers manage reliability using operational and power quality data.

EB100264



Dashboard - Energy Summary

Scalable, flexible architecture

Functional components

Provides operators with a rich environment to view and navigate real-time displays of measurements and status indicators; perform power quality and reliability analysis; historical trending; alarms; and manual control.

Web Clients
- Reports - generate or edit historical reporst for energy cost, consumption, and power quality (requires Microsoft SQL Server Standard Edition)
- Access power monitoring system from anywhere on your network using a web browser. Day-to-day functionality including system status, alarm response, or viewing dashboards. Web client provides authenticated access to common functions:
- Diagrams – navigate network displays to check system status and analyze trends
- Tables – quickly compare multiple devices in your network in real-time
- Reports – generate or edit historical reports for energy cost, consumption, and power quality
- Alarms – quickly identify alarm states in your system and investigate root causes
- Dashboards – share information from your power monitoring system with any occupant.

EB100283

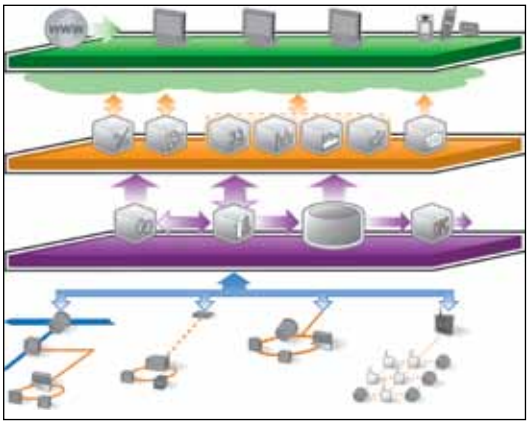
Engineering Client Applications

Engineering Workstations

Client software to allow engineers and power users access to administrative and configuration functions of the software, and real-time display, control, and historical analysis functions. The Engineering Workstation includes:
- Management Console – use this component to configure your StruxureWare Power Monitoring network, including communication paths, devices and logical groups
- Vista – build and edit custom graphical displays to represent your facility. One-line diagrams, campus maps, equipment plan views and mimic diagrams can be created using Vista graphical objects and imported graphic files
- Designer – use this interface to program ION devices and create system applications with ION Technology and Virtual ION Processors
- Reporter - generate or edit historical reporst for energy cost, consumption, and power quality.

StruxureWare Power Monitoring 7 (PowerLogic ION Enterprise™)
Functions and characteristics

PB88097



EB100266

*One Line example - **Diagrams***

EB100265

*Equipment Status example - **Diagrams***

Scalable, flexible architecture (cont.)

Data acquisition and management

- Device Support Library
- Virtual ION Processor
- Site server
- SQL ODBC-compliant databases
- SQL Server 2008 R2. 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 (included) OPC DA Server (optional).

Functions

StruxureWare Power Monitoring offers a wide range of functions:

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

Data acquisition and integration

Integrate WAGES (water, air, gas, electricity, steam) metering. Native, out-of-the-box support for dozens of devices (See Supported Devices section for details).

Enables access to real-time and timestamped historical meter data, control of on-board relays and digital outputs, and server time synchronization. Communicate over Internet, Ethernet, wireless. Interface with third-party meters, transducers, PLCs, RTUs and power distribution or mitigation equipment through Modbus or OPC. Add and configure direct communications with remote devices over Modbus RTU or Modbus TCP protocols using easy-to-use device templates.

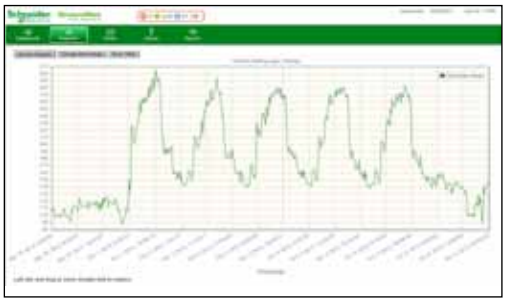
Scalable platform enables remote device and user client addition as needs grow while maintaining original investment. Integrate other energy management or automation systems (e.g. SCADA, BAC, DCS, ERP) through ODBC, XML, OPC, email, FTP, CSV and PQDIF compliance; integrate with web services through XML.

Real-time monitoring

- View the status of your electrical network from any workstation
- See numeric values, status indicators, gauges, and trends, all with intuitive graphical navigation
- Extend comprehensive out-of-the-box displays and create custom graphical diagrams to represent your facility; one-line diagrams, campus maps, equipment plan views and mimic diagrams can be created using embedded graphical objects and imported graphic files
- Quickly compare multiple devices in your network in real-time in a tabular display
- Choose from a library of pre-built tables, or create your own. Save your favorites for quick access later.

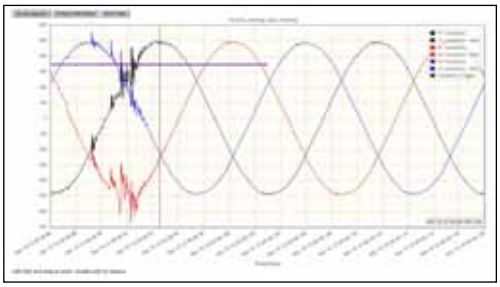
StruxureWare Power Monitoring 7 (PowerLogic ION Enterprise™)
Functions and characteristics

EB100268



*The **Diagrams** web application allows users to easily view create trend plots and analyze historical data.*

EB100269



*The **Diagrams** web application allows users to view and analyze waveforms captured by devices.*

EB100270

Trend analysis

- Trend any parameter to reveal demand peaks and track system-wide energy costs.
- Graph any combination of measured parameters
- Plot time-series or scatter charts
- Perform calculations, obtain statistics, and display historical data
- Identify dangerous trends and redistribute loads
- Optimise network capacity and avoid over-building
- View operating parameters and determine when maintenance is required
- Avoid peak demand surcharges and power factor penalties.

Power quality analysis

- StruxureWare Power Monitoring software allows continuous, wide-area monitoring and data capture for power quality and reliability conditions.
- Power quality events automatically detected by PQ-capable metering devices are uploded to the system automatically. Analyze waveforms to determine source and cause of issue
- Determine if power quality events are upstream or downstream (requires PowerLogic meter with Disturbance Direction Detection feature)
- 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 meters 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.

Alarms and events

StruxureWare Power Monitoring software allows you to receive alerts to outages or impending problems that could lead to equipment stress, failures, or downtime.

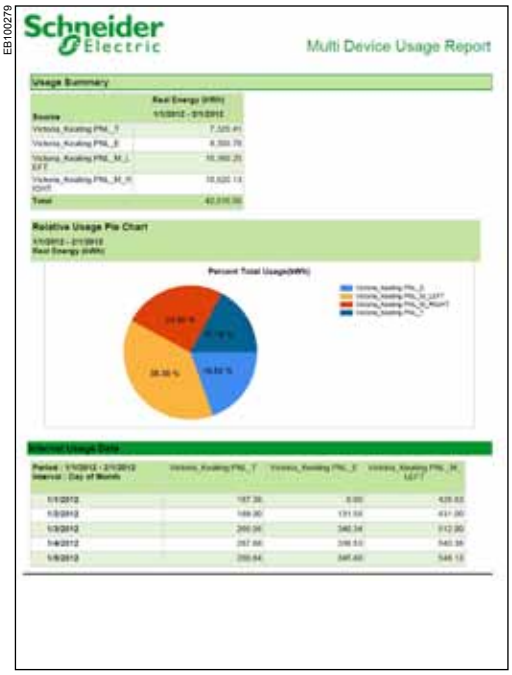
- Quickly filter on active or unacknowledged alarms
- Acknowledge alarms from anywhere in your facility
- Trigger on complex conditions
- Log all relevant data sequence of events for diagnosis
- Flag & avert potential problems
- Alert key personnel 24/7
- Optimise maintenance scheduling.

Dashboards

- Create engaging dashboard displays of your power monitoring system information and easily share information with anyone in your facility
- Make power monitoring information visible and engaging
- Promote education and drive behaviour
- Display as an interactive kiosk, on a corporate intranet, or as a slideshow on a large wall-mounted display
- Replace hard to maintain home-grown portals and dashboards
- Chart or trend any quantity in your power monitoring database
- Simple conversions into other units (e.g. dollars, emissions, normalizations, etc.)
- Compare multiple time-ranges
- Show impact of temperature, occupancy, or production values on energy usage
- Add eye-catching backgrounds to enhance presentation value
- User authentication for configuration, and both authenticated and unauthenticated modes available for display.

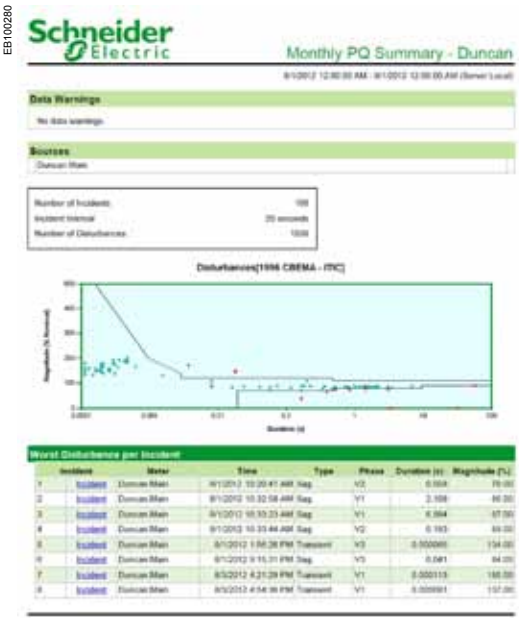
StruxureWare Power Monitoring 7 (PowerLogic ION Enterprise™)
Functions and characteristics

EB100279



*The **Reports** web application provides many different report templates to allow users to easily display and deliver the information they need .*

EB100280



*Power Quality Summary Report example - **Reports***

Reporting

- The powerful, intuitive reporting options let users see critical information exactly how, where, and when they need it
- Reports can be generated manually and saved as Excel, HTML and other formats or scheduled to automatically distribute to a printer or via email
- There are two different report engines that may be used (Reporter and web-based Reports). See the table below to compare their features.

Feature Set	SPM7 Reporter	SPM7 Web Reporter
Energy Cost Management		
Energy and Demand	■	■
Load Profile	■	■
Multi-Device Energy Usage	-	■
Energy Usage by Shift	-	■
Single Device Energy Usage	-	■
Network Management		
Power Quality	■	■
EN50160 Compliance	■	■
IEC-61000-4-30 10 Mins	■	■
IEC-61000-4-30 2 Hours	■	■
IEC-61000-4-30 3 Secs	■	■
100ms Report	-	■
Alarm History	-	■
Generic Reports		
Generic data query	■	-
Tabular Report	-	■
Trend Report	-	■
Feature Set		
Excel 2003 support	■	■
Excel 2007 support	■	■
Excel 2010 support	■	■
Export to Excel	■	■
Export to PDF	-	■
Export to HTML	■	■
Export to XML	-	■
Email	■	■
Print	■	■
Run on a Schedule	■	■
Run on Alarm	-	■
Accessible via Web Browser	-	■
Report Configuration Save	■	■
Report Edit	■	■
Custom Reports	■	■
Data Validation	■	-
TOU	■	■
User Administration	-	■
Translatable Reports	■	■

StruxureWare Power Monitoring 7 (PowerLogic ION Enterprise™)
Functions and characteristics

PE86125

*Custom graphics screen example - **Diagrams***

EB100281

*Campus map example - **Diagrams***

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
- Perform manual or setpoint-triggered functions
- Coordinate control of multiple loads, generators, relays, etc.
- Support energy-saving applications
- Manage distributed energy assets
- Automate substations & reduce service time.
- Interoperability
- Integrate all energy management and automation systems (SCADA, BAC, DCS, ERP, etc.)
- Share data with third-party SCADA, automation, and accounting systems
- Comply with ODBC, OPC, and PQDIF standards

Patented ION technology

StruxureWare Power Monitoring software and a variety of PowerLogic ION metering products feature the unique ION architecture. This 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.

Software is available in English, French, Spanish, German, and Chinese. Other languages may be available - contact your Schneider Electric representative.

Part numbers*		
New systems & add-ons	**IE7PRIMARY**	StruxureWare Power Monitoring Primary server (DVD, includes all available languages)
	IE7DLS(1)	Individual Device Licence for High-End Devices. Compatible with all device types.
	IE7DLM(1))	Individual Device Licence for Mid-Range Devices. Compatible with Mid- and Entry-range devices.
	IE7DLE(1)	Individual Device Licence for Entry-Range Devices. Compatible with Entry range devices
	IE7ENGCLIENT(2)	Engineering Client Licence (DVD) - Access to Management Console, Vista, Designer, Reporter and Web applications; one licence per user.
	IE7WEBCLIENT(2)	Web Client Licence - Access to Diagrams, Tables, Alarms, Reports, Dashboard; one licence per user
	IE7UNLCLIENT(3)	Unlimited Licence for unlimited number of users (Engineering or Web applications); mandatory for public displays or Internet hosting.
	IE7OPCSERVER	OPC DA Server for StruxureWare Power Monitoring
	IE7SECONDARY	Secondary Server for StruxureWare Power Monitoring
Upgrades from earlier versions	**IE7PRIMARYUPG**(4)	StruxureWare Power Monitoring UPGRADE software (DVD, includes all available languages)
	IE7DLSUPG(1)	Upgrade DL-S device licence
	IE7DLMUPG(1)	Upgrade DL-M device licence
	IE7DLEUPG(1)	Upgrade DL-E device licence
	IE7ENGCLIENTUPG(2)	Engineering Client Upgrade Licence - Access to Management Console, Vista, Designer, Reporter and Web applications; one licence per user.
	IE7WEBCLIENTUPG(2)	Web Client Upgrade Licence - Diagrams, Tables, Alarms, Reports; one licence per user
	IE7UNLCLIENTUPG(3)	Unlimited Client Upgrade Licence for unlimited number of users (Engineering or Web applications); mandatory for public displays or internet hosting.
	IE7SECONDARYUPG	Secondary Server Upgrade for StruxureWare Power Monitoring
Technical documentation	**CD-TECHDOC**	Latest version of technical documentation for StruxureWare Power Monitoring

***(1)** An appropriate device licence (DL-S, DL-M, DL-E) is required for each device added to your system in Management Console. A minimum order value may apply.*
***(2)** Each user of the system must have an appropriate Client Licence. An Engineering Client Licence permits access to Management Console, Vista, Designer, Reporter and the Web applications. This includes remote access through Terminal Services or other methods. A Web Client licence only permits access to web applications - Dashboards, Diagrams, Tables, Alarms, Reports. Contact your sales representative for more information.*
***(3)** An Unlimited Client Licence provides access to all software applications (including Management Console, Vista, Designer, Reporter, Dashboards, Diagrams, Tables, Alarms, Reports) for an unlimited number of users. This type of Client License is required when accounting for individual users is not possible (applications available in public areas, internet hosting, etc). Engineering Client or Web Client Licenses are not required when an Unlimited Client License is in place. Please note that performance limitations of your installation may affect the practical number of concurrent users.*
***(4)** Upgrade part numbers apply to PowerLogic ION Enterprise 5.6 and later, and PowerLogic SMS v4.x. Technical upgrades from earlier versions may be possible - contact your sales representative for more information.*
** Please consult a Schneider Electric sales representative for full pricing and part numbers information.*

StruxureWare Power Monitoring 7 (PowerLogic ION Enterprise™)
Functions and characteristics

Features	Included	Optional
Dashboards	■	-
Diagrams	■	-
Tables	■	-
Alarms	■	-
Reports*	■	-
Modbus Device Importer	■	-
Designer	■	-
EGX300 Log File Importer	■	-
SQL Server 2008 R2 Express Edition	■	-
SQL Server 2008 R2 Standard Edition	-	■
OPC client	■	-
OPC server	-	■

Minimum system requirements

Please consult your local Schneider Electric representative for complete system requirements and commissioning information for StruxureWare Power Monitoring.

***Note:** There are two different report engines that may be used: Reporter and web-based Reports. The Reporter application is always available as an Engineering Client tool. The web-based Reports feature is only available when the system has been installed using **SQL Server Standard Edition**.*

EB100282

Supported devices

PowerLogic power and energy meters:
- ■ ION8800 Series
- ■ ION8650 Series
- ■ ION7650/7550
- ■ ION7550RTU
- ■ ION6200
- ■ PM5350
- ■ PM3000 Series (PM3250, PM3255)
- ■ PM1200
- ■ PM800 Series (PM810, PM820, PM850, PM870)
- ■ PM700 Series (PM710, PM750)
- ■ PM600 Series (PM600, PM620, PM650)
- ■ PM210
- ■ PM9C
- ■ DM6200
- ■ DM6300
- ■ EM1200
- ■ EM5600
- ■ iEM3000 Series (iEM3150, iEM3155, iEM3250, iEM3255)
- ■ EM1200 Series

PowerLogic circuit monitors:
- ■ CM2000 Series (CM2050, CM2150, CM2250, CM2350, CM2450)
- ■ CM3000 Series (CM3250, CM3350)
- ■ CM4000 Series (CM4150, CM4250, CM4000T).

PowerLogic branch circuit power meters:
- ■ BCPM (A, B, C models).

Circuit breaker trip units
- ■ Micrologic A, E, P and H devices
- ■ Micrologic Compact NSX Type A and Type E.

Protective relays
- ■ Sepam Series 10, 20, 40, 48, 80.

Insulation monitors
- ■ Vigilohm IM20.

Power Measurement power and energy meters:
- ■ ION8000 Series (ION8300, ION8400, ION8500, ION8600,)
- ■ ION7000 Series (ION7500, ION7600, ION7700)
- ■ ION7500RTU
- ■ ION7300 Series (ION7300, ION7330, ION7350)
- ■ ACM3000 Series (ACM3300 , ACM3710, ACM3720).

PLCs for WAGES applications
- ■ Modicon Momentum M1 - TR (A8, D10, D16)
- ■ Twido Modular PLC (D12,D28, D44).

Communications Interfaces
- ■ Acti9 Smartlink.

"Limited Edition" (LE) drivers available for download from website
- ■ Modbus-compatible devices
- ■ Other devices through OPC.

StruxureWare PowerSCADA Expert
Functions and characteristics

PBS100001

StruxureWare PowerSCADA Expert.

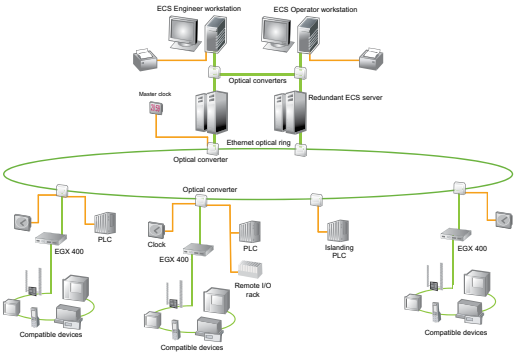
StruxureWare PowerSCADA Expert (previously known as PowerLogic SCADA) is a reliable, flexible and high performance monitoring and control solution designed to reduce outages and increase power efficiency. It is built to handle user requirements from the smallest to the most demanding enterprises, while still providing high time performance and reliability. Easy-to-use configuration tools and powerful features enable faster development and deployment of any size of application.

Object-based, standard graphics and symbols provide operators with an interactive and user-friendly interface. Intuitive commands and controls increase efficiency of operators to interact with the system interface. StruxureWare PowerSCADA Expert controls your system with high reliability, performance and data integrity through the use of advanced architectures, such as hot/warm redundant I/O device configurations, self-healing ring communications, and primary and standby server configurations. Comprehensive user-based security is integrated into all interface elements, ensuring a secure control system.

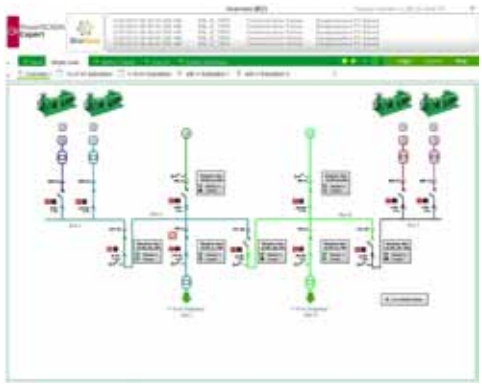
Typical applications

StruxureWare PowerSCADA Expert software has the following applications:
- Network protection and control
- Operate distribution network safely and reliably
- Improve continuity of electrical service
- Equipment monitoring and control
- Energy availability and reliability
- Verify the reliable operation of equipment
- Support proactive maintenance to prolong asset life.

PE86178



Functional components of StruxureWare PowerSCADA Expert.



System architecture

Human machine interface (HMI)

StruxureWare PowerSCADA Expert offers secure, operator-dedicated, multi-user data and control access through a local server interface, full control client and also through web clients.

Main components
- ■ SCADA software
  - □ Drivers, libraries and communication tools.
  - □ Use these components to configure your SCADA network, including communication paths, devices and logical groups.
- ■ Communication hardware
  - □ Includes gateways, PLCs, RTUs, switches, etc.
  - □ Redundant, self-healing ring, double-ring technology
- ■ Design reference guide
  - □ Design of architectures to achieve time performance & reliability
- ■ Schneider Services
  - □ Pro-active assistance to facility maintenance team for sensitive electrical distribution maintenance operations.

Data acquisition and management
- □ Redundant I/O server
- □ Hot/warm standby: data acquisition is never interrupted even if one server fails.
- □ Distributed, multiple server architecture
- □ I/O servers, with corresponding configuration tools
- □ IEC61850 compliant databases
- □ Designed for interoperable exchange of data for distributed substation automation systems and third-party devices.
- □ Supports data import/export with compliant devices and systems.

StruxureWare PowerSCADA Expert
Functions and Characteristics (cont.)

PB100005

Monitor the whole communications network. Connect to switches, IEDs, RTUs, control and monitoring devices. Extract values for dynamic power and energy readings.

Functions

StruxureWare PowerSCADA Expert offers a wide range of functions:
- Data acquisition and integration.
- Alarms and events with 1ms timestamp support.
- Electrical distribution control.
- Real-time monitoring.
- Analysis.

Data acquisition and integration

Integrate electrical distribution devices with PLCs, RTUs, Controllers and other intelligent energy devices. Native, out-of-the-box support for all SEPAM Series 20, 40, 80, and SEPAM 2000 (S36), Micrologic 5.0P and 6.0P, Micrologic A, Micrologic A FW v2, Micrologic H, PowerLogic CM4000 series, PM800 series, PM710, PM750, ION7650 and BCPM/BCM42. Enables access to meter data, control of protection relays and digital outputs and remote configuration. Interface with PLCs, RTUs and power distribution equipment. Quickly add and configure devices with easy-to-use Profile Wizard and Profile Editor. 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 through Modbus TCP/IP.

PB100004

View all alarm conditions at a glance.

Alarms and events

StruxureWare PowerSCADA Expert software allows you to receive alerts to outages or impending problems that could lead to equipment stress, failures, or downtime. Configure alarms to trigger on events, power thresholds, or equipment conditions. The software logs complete information on an event, including related coincident conditions, all with accurate 1ms timestamping.
- Easily discriminate between alarm criticality levels.
- High speed alarm response. Capture and log every single alarm or event.
- Organise, filter and print by any alarm property. Configure specific alarm occurrences to change symbol color or flash an icon on a page.
- View the five most recent alarms from every page, providing detailed information in easy-to-understand formats.
- Event log for all PC-based and on-board field events, alarms.
- Easily configure to annunciate based on alarm type.

Standards supported
- IEC61850
- DNP3

PBS100006

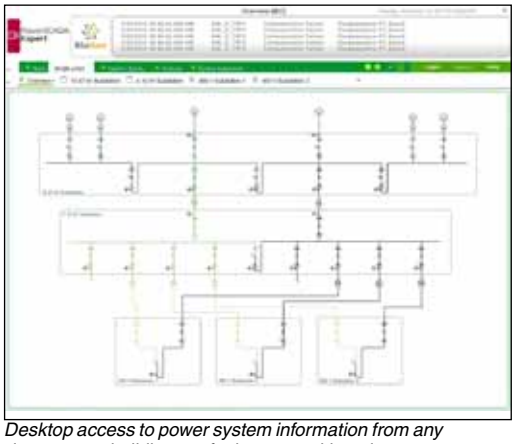
System Supervision displays such as this let the user see the real-time status of all devices and provide detailed information for best decision making.

Electrical distribution control

Perform fast, manual control operations by clicking on-screen trigger buttons, and operate remote breakers, protection relays, and other power distribution equipment.

StruxureWare PowerSCADA Expert
Functions and Characteristics (cont.)

PBS100002



Desktop access to power system information from any department, building or of relevant, realtime data.

Real-time monitoring
View all distribution points across your network. Secure display of 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.

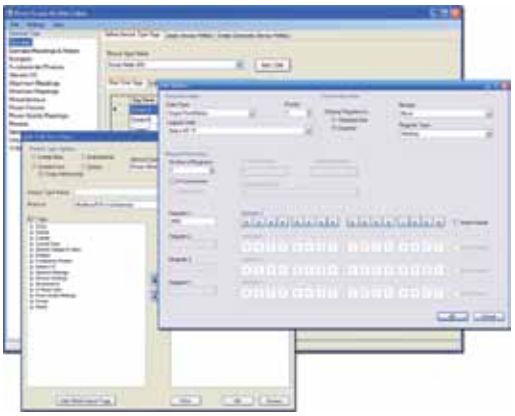
■ Single line diagrams with real-time monitoring and control of devices, objects and distribution points. Point-and-click navigation reveals deeper layers of detail.
■ IEC- and ANSI-standard symbols and templates that are fully animated and interactive, to blend control and display functionality.
■ Dynamic colouring is easily configured using the default set or user-defined colours and voltage levels.
■ True color, easy-to-use human machine interface (HMI) that provides operators with intuitive and consistent screens.

PBS100003

Optimise equipment use by maximising capacity or balancing loads. Reveal critical trends, expensive processes or energy waste.

Analysis
Trend and analyse on any measured parameter, allowing operators to recognise patterns that may lead to disturbances. Display millisecond-accurate historical alarms and trends to help determine the sequence of events or root cause analysis. Unite trend and alarm data for sophisticated disturbance views and analysis. User-defined colour coding and overlays clearly highlight data series, time ranges, thresholds and limits. View waveforms via ActiveX tool (waveforms from the ION8650 are captured via IEC61850 only). Record, save or export trends to archives.

PE86189

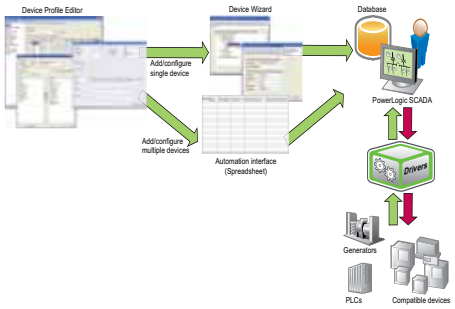


Use the Profile Editor and Profile Wizard to design and configure your network. Customise device profiles specific to your project.

Configuration tools
StruxureWare PowerSCADA Expert is supplied with a package of configuration tools designed to make set up uniquely easy and quick.
■ Designed to help make project set up and network configuration fast and easy.
■ **Profile Editor** provides standard device types and their associated profiles and allows engineers to easily customise the profiles of the devices specific to the project. New export/import capability allows easier sharing of profiles.
□ Standardized tags per device profile (configurable), XML file.
□ Creates, adds, edits device types, tags and profiles.
■ **Profile Wizard** provides a standard interface for quick SCADA data base generation:
□ Instantiation of devices, on a per object basis.
□ Creates tags, trends, alarms and events when devices are added to system.
□ Batch editing supported by automation interface.

StruxureWare PowerSCADA Expert
Functions and Characteristics (cont.)

PE86190



PowerLogic SCADA files and data flow configuration steps.

Minimum system requirements

Please consult your local Schneider Electric representative for complete system requirements and commissioning information for StruxureWare PowerSCADA Expert. The following are minimum support requirements with factory default settings.

- Runs on standard PCs or servers, and supports the following operating systems:
  - Windows 2003 Server (32-bit)
  - Windows XP Professional (32-bit)
  - Windows Vista Business
  - Windows XP SP3 (32-bit)
  - Windows 2003 Server SP2 (32-bit)
  - Windows Vista SP2 (32- and 64-bit)
  - Windows Server 2008 SP2 (32- and 64-bit)
  - Windows 7 (32- and 64-bit)

PE86191

Supported devices and protocols

PowerLogic electrical network protection:
- Sepam series 20, 40, 80, SEPAM 2000 (S36)

PowerLogic power and energy meters:
- PM800 series
- PM710, PM750
- CM4000 series
- ION 7650

Circuit breaker control units
- Micrologic 5.0P
- Micrologic 6.0P
- Micrologic A, and Micrologic A FW v2
- Micrologic H

Branch circuit monitors
- BCPM
- BCM42

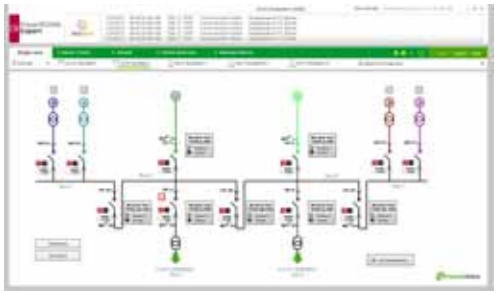
Native device protocol support
- IEC 61850 Edition 1 (New)
- DNP3
- ModBus TCP/IP
- RS-485
- SNMP

Optional support
- IEC 80750-5-104
- BCM42

Data access (Other protocols support)
- OPC DA Version 1 & 2 Client Server
- ODBC

Other:
- Any PLC or other device via Modbus protocol

StruxureWare PowerSCADA Expert
Functions and Characteristics (cont.)



Part Numbers		
Description		
StruxureWare PowerSCADA Expert **Software and one (1) key in a box**		
PowerLogic SCADA box with DVD and USB key		**PLS109922**
PowerLogic SCADA box with DVD and Parallel key		**PLS109912**
PowerLogic SCADA additional USB key		**PLS109921**
PowerLogic SCADA additional Parallel key		**PLS109911**
Server Licences (includes server Control Client)		
Server Licence	75	**PLS101110**
	150	**PLS101111**
	500	**PLS101112**
	1500	**PLS101113**
	5000	**PLS101114**
	15000	**PLS101115**
	Unlimited	**PLS101199**
Control Client Licences		
Control Client Licence	75	**PLS102010**
	150	**PLS102011**
	500	**PLS102012**
	1500	**PLS102013**
	5000	**PLS102014**
	15000	**PLS102015**
	Unlimited	**PLS102099**
	Redundant (floating licence)	**PLS102088**
Web Control Client Licences		
Web Control Client Licence	75	**PLS102210**
	150	**PLS102211**
	500	**PLS102212**
	1500	**PLS102213**
	5000	**PLS102214**
	15000	**PLS102215**
	Unlimited	**PLS102299**
	Redundant (floating licence)	**PLS102288**
View Only Client Licences		
View Only Client Licence	Independent of points	**PLS103099**
	Redundant (floating licence)	**PLS103088**
Web View Only Client Licences		
Web View only Client Licence	Independent of points	**PLS103299**
	Redundant (floating licence)	**PLS103288**
Point Expansions		
Server licence point expansion	75 - 150	**PLS101110-11**
	150 - 500	**PLS101111-12**
	500 - 1500	**PLS101112-13**
	1500 - 5000	**PLS101113-14**
	5000 - 15000	**PLS101114-15**
	15000 - unlimited	**PLS101115-99**
Control licence point expansion	75 - 150	**PLS102010-11**
	150 - 500	**PLS102011-12**
	500 - 1500	**PLS102012-13**
	1500 - 5000	**PLS102013-14**
	5000 - 15000	**PLS102014-15**
	15000 - unlimited	**PLS102015-99**
Web control licence point expansion	75 - 150	**PLS102210-11**
	150 - 500	**PLS102211-12**
	500 - 1500	**PLS102212-13**
	1500 - 5000	**PLS102213-14**
	5000 - 15000	**PLS102214-15**
	15000 - unlimited	**PLS102215-99**

StruxureWare PowerSCADA Expert
Functions and Characteristics (cont.)

Part Numbers	
Description	
Key Reprogramming	
Reprogramming fee - Authorisation Code[1]	**PLS109401**
Tech Support[2]	
Silver 1 year support, first year, compulsory	**PLS109102**
Silver 1 year support, renewal	**PLS109122**
Gold 1 year support, first year	**PLS109103**
Gold 1 year support, renewal	**PLS109101**

Service Levels

Level	Service Description
Silver	No access to a new version; Tech support business hours; Hot Fix
Gold	12 months access to a new version; Tech support business hours; Hot Fix

1: Reprogramming fee is required for any key modifications: addition of a new licence or point expansion

2: First year Tech Support is not included in licence. First year Tech Support is compulsory. Subscription level is not available for 1st year, minimum level is Silver or above. Support reinstatement applies 3 year backwards maximum.

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Capital social 896 313 776 €

http://www.schneider-electric.com
PLSED309005EN

Printed on ecological paper

Layout: Schneider Electric
Photos: Schneider Electric
Printing:

05-2013