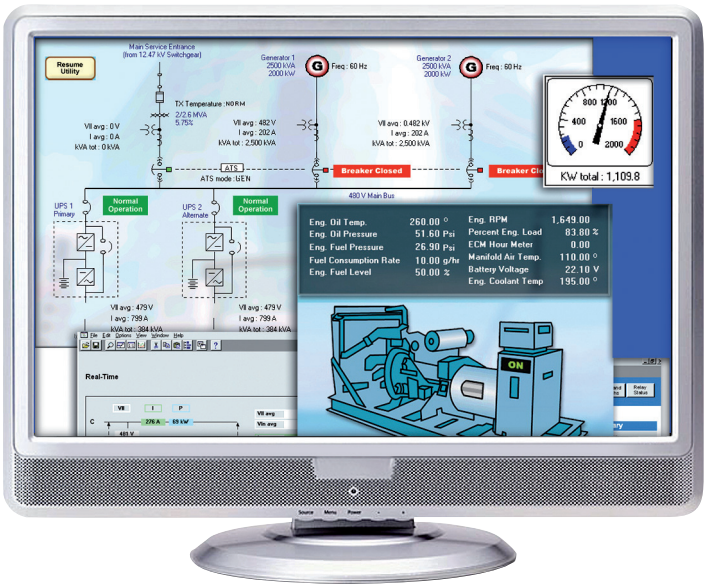
Electrical network management

PowerLogic System

Energy management, revenue metering and power quality monitoring

Catalogue
2011



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.

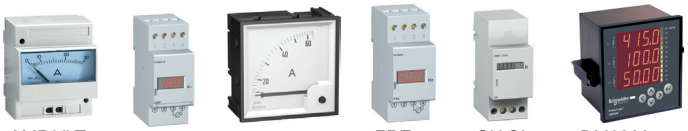
General contents

Gain energy insight and control with PowerLogic™ 4
Market segments 6
Panorama of the PowerLogic range 8
General information on power-monitoring software 13
Index of catalogue numbers 14

Current transformers 18

CT

Panel instruments 23

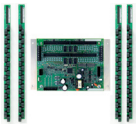


AMP VLT *FRE* *CH CI* *DM6000*

Kilowatt-hour meters 39

EN40 *ME*

Power-monitoring units selection guide 44
Multi-circuit metering



BCPM

Basic energy metering 54

PM9 *PM1000* *PM200*

Mid-range metering 73

PM700 *PM800*

Advanced energy metering 95

ION7550 - ION7650 *ION8600* *ION8650* *ION8800*

Communications 129

EGX100 *EGX300* *ION7550RTU*

Monitoring software 145

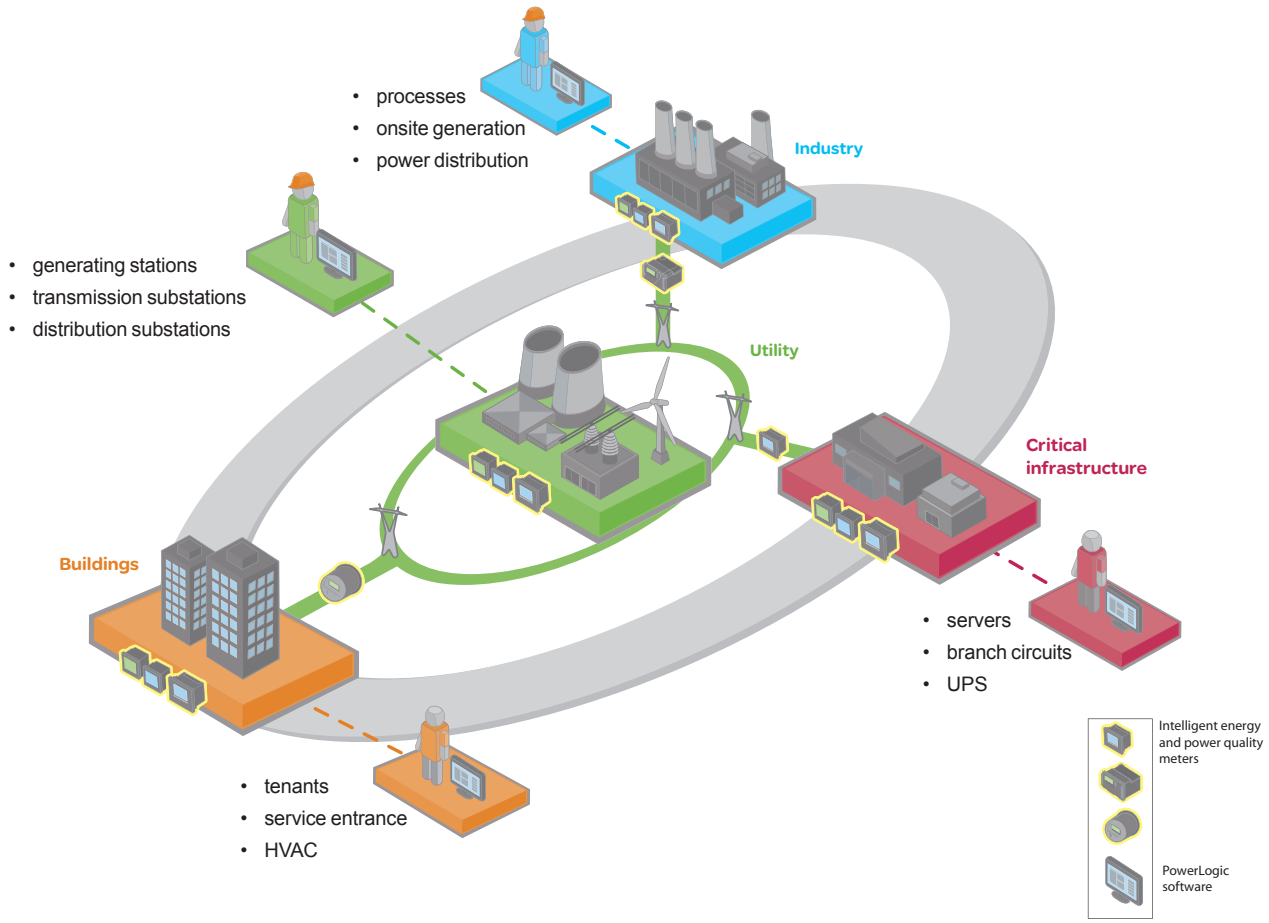
PowerView *ION Enterprise* *SCADA*

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

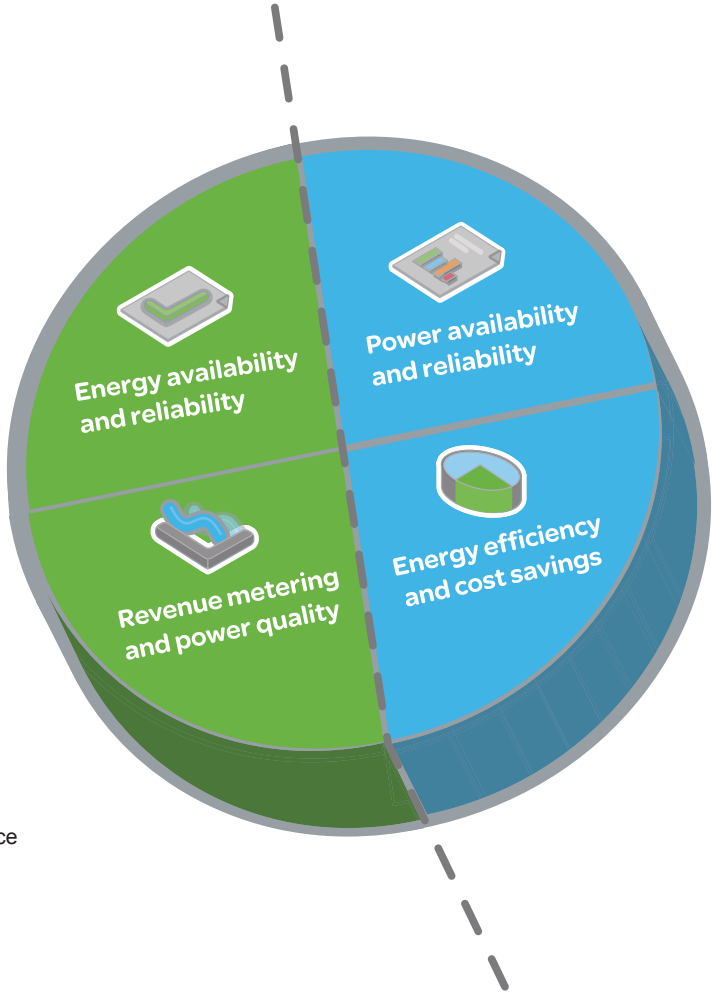
SUPPLY

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

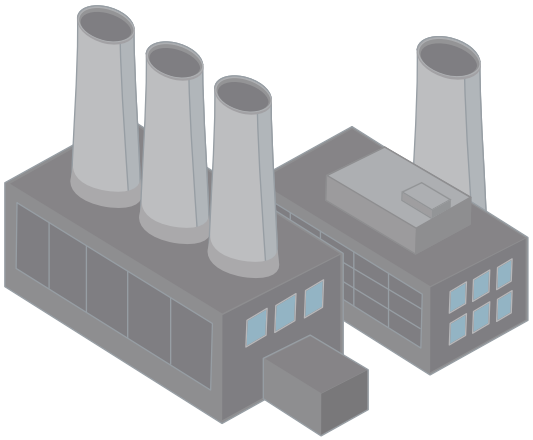
Energy efficiency and cost savings

- 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

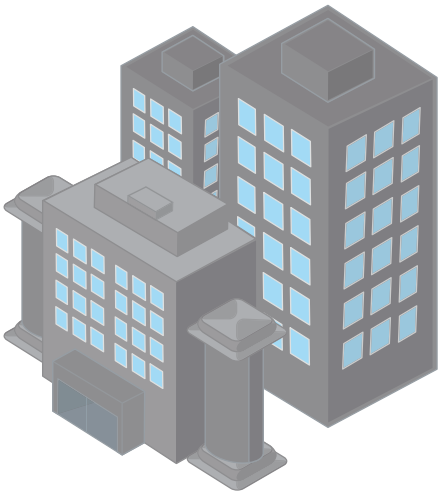
Market segments

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

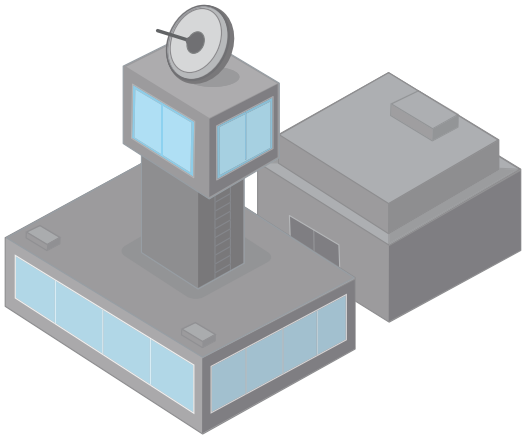
Building managers through operations staff can cut energy and maintenance costs without effecting the comfort or productivity of their tenants, employees, students, patients or customers. A PowerLogic system will track all utilities and equipment conditions, and enterprise-level software will help you 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

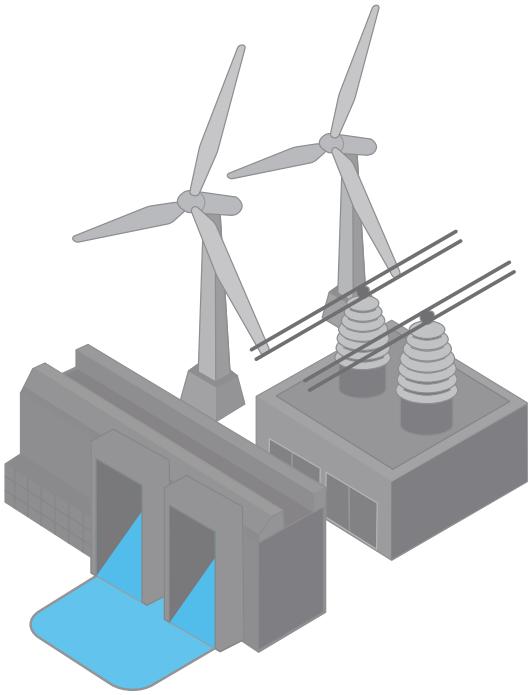
Market segments (cont.)

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

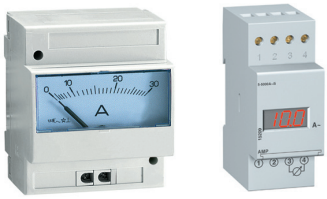
- insulated cable, diameter 21 to 35 mm, trough transformer
- busbar through transformer
- cable connections

Characteristics

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

page 18

Panel instruments



Name	AMP / VLT	AMP / VLT
Function	ammeter, voltmeter	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
Installation	DIN rail 4 x 18 mm modules	DIN rail 2 x 18 mm modules
Voltage measurement	VLT : 500 V AC direct or external VT	VLT : 600 V AC direct or external VT
Current measurement	AMP : 30 A direct or external CT	AMP : 10 A direct or external CT
Communication ports		
Inputs / Outputs		
Memory capacity		

page 23

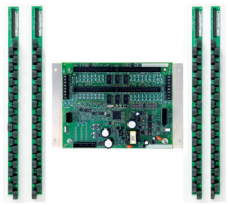
page 24

Panorama of the PowerLogic range (cont.)

Kilowatt-hour meters

	AMP / VLT	FRE	CH / CI	DM6000	EN40 ME
	ammeter, voltmeter	frequency meter	hour counter pulse counter	digital panel meter	kilowatt-hour meters
	I / U	F	hours /pulses	I, V, F, PF	E
	class 1.5	± 0.5 % ± 1 digit		1 %	class 1
	flush mounted 72 x 72 mm 96 x 96 mm	DIN rail 2 x 18 mm modules	CI, CH: DIN rail 2 x 18 mm modules CH: flush mount	flush mounted 96 mm x 96 mm	DIN rail 1.2 or 4 x 18 mm modules
	VLT : 500 V AC direct or external VT	400 V AC direct		80 - 480 V AC L-L without PTs	400 V AC direct
	AMP : external CT			50 mA to 6 A (5 mA starting)	40 to 63 A direct or external CT
	page 25	page 24	page 29	page 33	page 39

Panorama of the PowerLogic range (cont.)

	Multi-circuit metering	*Basic energy metering*			*Mid-range metering*	
						
Name	**BCPM**	**PM9 / PM9P / PM9C**	**PM1000**	**PM200/ PM200P/PM210**	**PM700 / PM700P/ PM710/PM750**	
Function	branch circuit monitor IEC 61036 Class 1	power meter IEC 61557-12 PMD/ S-/K55/1	power meter	power meter IEC 61557-12 PMD/ S/K55/1	power meter IEC 61557-12 PMD/SD or SS/K55/1 PMD/SD or SS/K55/0.5 (PM750 only)	
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 maximum demand)**	**I, U, F, P, Q, S, PF, E (Power and current demand)**	**I, U, F, P, Q, S, PF, E (Power and current demand)**	**I, U, F, P, Q, S, PF, E, THD, Min/Max, I/O, alarm PM750 only) (Power 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	class 1 (mains active energy)	class 1 (active energy)	class 1 (active energy)	class 1 (active energy)	class 1 (active energy) class 0,5S (PM750 only)	
Installation	Installed in panel or enclosure	DIN rail 4 x 18 mm modules	flush 96 x 96 mm	flush and DIN rail mount 96 x 96 mm	flush and DIN rail mount 96 x 96 mm	
Voltage measurement	90 – 277 V Line to Neutral voltage Inputs	450 V AC direct or external VT	480 V AC L-L / 277 V AC L-N	480 V AC L-L / 277 V AC L-N	480 V AC L-L / 277 V AC L-N	
Current measurement	CT strips for branch circuits and external CTs for mains	external CT	external CT	external CT	external CT	
Communication ports	1 for main	1	1 (PM1200 only)	1 (PM210 only)	1 (PM710 and PM750 only)	
Inputs / Outputs		1 / O	0 / O	2 / O (PM200P only)	2 O (PM700P only) 2 I / 1 O (PM750 only)	
Memory capacity						
		page 54	**page 60**	**page 67**	**page 73**	

Panorama of the PowerLogic range (cont.)

Advanced energy metering

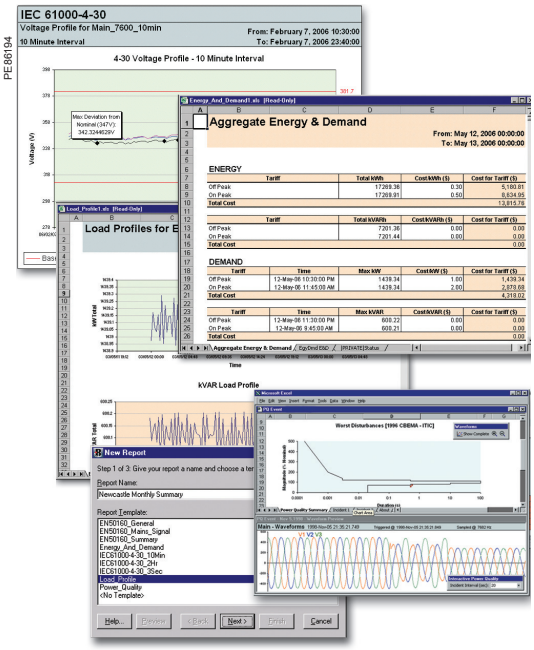
	PM810	PM820/PM850	PM870	ION7550	ION7650	ION8600 A	ION8600 B	ION8600 C	ION8650 A	ION8650 B	ION8650 C	ION8800 A	ION8800 B	ION8800 C
	power meter IEC 61557-12 PMD/SD/K70/0.5 PMD/SS/K70/0.5		power meter IEC 61557-12 PMD/SD/K70/0.2 PMD/SS/K70/0.2	energy and power quality meter IEC 62052-11 IEC 62053-22/23 Class 0,2S IEC 61000-4-30		energy and power quality meter IEC 62052-11 IEC 62053-22/23 Class 0,2S						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 (demand, minimum and maximum values)										
			dip/swell											
		PM850 only												
	class 0,5S (active energy)		class 0,2S (active energy)	class 0,2S (active energy)		class 0,2S (active energy)						class 0,2S (active energy)		
	flush and DIN rail mount 96 x 96 mm	flush and DIN rail mount 96 x 96 mm	flush and DIN rail mount 96 x 96 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	600 V AC L-L / 347 V AC L-N	600 V AC L-L / 347 V AC L-N	57-347V L-N AC or 100-600V L-L AC		57-277V L-N AC (9S, 39S, 36S and 76S); 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		
	3	3	3	5		5						5		
	18 I/O	18 I/O	18 I/O	up to 32 I/O		up to 25 I/O						up to 16 I/O		
	80 kbytes with PM810 LOG	80 / 800 kbytes	800 kbytes	up to 10 MB		10 MB	5 MB	2 MB				up to 10 MB		
	page 81			page 95		page 113						page 120		

Panorama of the PowerLogic range (cont.)

	Communications			*Monitoring software*		
						
Name	**EGX100**	**EGX300**	**ION7550RTU**	**PowerView**	**ION Enterprise**	**SCADA**
Function	Ethernet gateway	Integrated gateway-server	Ethernet gateway-server + onboard I/O	Power monitoring	Power management	Network protection and control
Features						
RS485 / Ethernet gateway	■	■	■			
Devices supported	PM9C, PM710, PM750, PM800 series, CM3000 series, CM4000 series, Sepam, Micrologic	PM9, all PM200, PM700, PM800 series, all CM3000, CM4000 series, ION8800, ION8600, ION7550/7650, Sepam,Micrologic, Compact NSX	ION8800, ION8600, ION7550/7650, ION6200, Modbus devices	PM9C, PM200, PM710, PM750, PM800 series, ION6200, Micrologic, Compact NSX	ION8800, ION8600, ION7550/7650, PM800 series, ION7300 series, PM710, PM750, ION6200, PM210, all CM3000, CM4000 series, BCPM, Sepam, Micrologic, Compact NSX	Sepam series 40 Micrologic 5.0P Micrologic 6.0P PM800 series BCPM/BCM42 CM4000 series
Web server with standard HTML pages		■	■		■	■
Web server with custom HTML pages		■			■	■
Real time data		■	■	■	■	■
Historical data		■		■	■	■
Automatic notification			■		■	■
Alarm and event logs					■	■
Waveform display					■	■
Custom animated graphics					■	■
Manual/automatic reports				Manual only	■	■
Characteristics						
Ethernet ports Modbus TCP/IP protocol	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			
Number of devices connected directly	32	64	64			
RS232 configuration ports	1		1			
Miscellaneous			modem port I/O (24 I/30 O max)			
Installation	DIN rail	DIN rail	DIN 192 cutout (186 x 186 mm)			
	page 131	page 133	page 135	page 147	page 151	page 157

General information on power-monitoring software

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



More and more devices are capable of communicating.
The number of available measurements is also on the rise, creating the need for a tool to successfully manage all the information.

The main purpose of software is to simplify complex sites so that they can be managed by humans:
- make the site and its operation intelligible
- make the power system tangible and visible.

The role of software

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

Cat. no.	Description	Page
15100		
15125	CMV voltmeter selector switch, DIN rail	28
15126	CMA ammeter selector, DIN rail	28
15197	Power Meter PM9P (220 to 240 V AC)	54
15198	Power Meter PM9C (220 to 240 V AC)	54
15199	Power Meter PM9 (220 to 240 V AC)	54
15200		
15201	VLT digital voltmeter, DIN rail	24
15202	AMP direct reading digital ammeter, DIN rail	24
15208	FRE digital frequency meter, DIN rail	24
15209	AMP multi-rating digital ammeter, DIN rail	24
15237	EN'clic digital kilowatt-hour meter	39
15238	EN40 digital kilowatt-hour meter	39
15239	EN40p digital kilowatt-hour meter	39
15400		
15440	CH hour counter, DIN rail (230 V AC)	29
15443	CI impulse counter, DIN rail	30
15600		
15607	CH hour counter, 48 x 48 (24 V AC)	29
15608	CH hour counter, 48 x 48 (230 V AC)	29
15609	CH hour counter, 48 x 48 (12 to 36 V DC)	29
16000		
16003	AMP analogue ammeter, 72 x 72, for motor feeders (delivered without dial)	25
16004	AMP analogue ammeter, 72 x 72, for standard feeders (delivered without dial)	25
16005	VLT analogue voltmeter, 72 x 72	25
16006	Dial, 0-30-90 A, for AMP 16003	25
16007	Dial, 0-75-225 A, for AMP 16003	25
16008	Dial, 0-200-600 A, for AMP 16003	25
16009	Dial, 0-50 A, for AMP 16004	25
16010	Dial, 0-100 A, for AMP 16004	25
16011	Dial, 0-200 A, for AMP 16004	25
16012	Dial, 0-400 A, for AMP 16004	25
16013	Dial, 0-600 A, for AMP 16004	25
16014	Dial, 0-1000 A, for AMP 16004	25
16015	Dial, 0-1250 A, for AMP 16004	25
16016	Dial, 0-1500 A, for AMP 16004	25
16017	CMA ammeter selector switch, 48 x 48	27
16018	CMV voltmeter selector switch, 48 x 48	27
16019	Dial, 0-2000 A, for AMP 16004	25
16029	AMP analogue ammeter for direct connection, DIN rail	23
16030	AMP analogue ammeter for connection to TC (delivered without dial), DIN rail	23
16031	Dial, 0-5 A, for AMP 16030	23
16032	Dial, 0-50 A, for AMP 16030	23
16033	Dial, 0-75 A, for AMP 16030	23
16034	Dial, 0-100 A, for AMP 16030	23
16035	Dial, 0-150 A, for AMP 16030	23
16036	Dial, 0-200 A, for AMP 16030	23

Cat. no.	Description	Page
16037	Dial, 0-250 A, for AMP 16030	23
16038	Dial, 0-300 A, for AMP 16030	23
16039	Dial, 0-400 A, for AMP 16030	23
16040	Dial, 0-500 A, for AMP 16030	23
16041	Dial, 0-600 A, for AMP 16030	23
16042	Dial, 0-800 A, for AMP 16030	23
16043	Dial, 0-1000 A, for AMP 16030	23
16044	Dial, 0-1500 A, for AMP 16030	23
16045	Dial, 0-2000 A, for AMP 16030	23
16060	VLT analogue voltmeter (0-300 V), DIN rail	23
16061	VLT analogue voltmeter (0-500 V), DIN rail	23
16073	AMP analogue ammeter, 96 x 96, for motor feeder (delivered without dial)	26
16074	AMP analogue ammeter, 96 x 96, for standard feeder (delivered without dial)	26
16075	VLT analogue voltmeter, 96 x 96	26
16076	Dial, 0-30-90 A, for AMP 16073	26
16077	Dial, 0-75-225 A, for AMP 16073	26
16078	Dial, 0-200-600 A, for AMP 16073	26
16079	Dial, 0-50 A, for AMP 16074	26
16080	Dial, 0-100 A, for AMP 16074	26
16081	Dial, 0-200 A, for AMP 16074	26
16082	Dial, 0-400 A, for AMP 16074	26
16083	Dial, 0-600 A, for AMP 16074	26
16084	Dial, 0-1000 A, for AMP 16074	26
16085	Dial, 0-1250 A, for AMP 16074	26
16086	Dial, 0-1500 A, for AMP 16074	26
16087	Dial, 0-2000 A, for AMP 16074	26
16088	Dial, 0-2500 A, for AMP 16074	26
16089	Dial, 0-3000 A, for AMP 16074	26
16090	Dial, 0-4000 A, for AMP 16074	26
16091	Dial, 0-5000 A, for AMP 16074	26
16092	Dial, 0-6000 A, for AMP 16074	26
16400		
16451	TC 50/5 tropicalised transformer for cables	19
16452	TC 75/5 tropicalised transformer for cables	19
16453	TC 100/5 tropicalised transformer for cables	19
16454	TC 125/5 tropicalised transformer for cables	19
16455	TC 150/5 tropicalised transformer for cables	19
16456	TC 200/5 tropicalised transformer for cables	19
16459	TC 150/5 tropicalised transfo. for cables and busbars	19
16460	TC 200/5 tropicalised transfo. for cables and busbars	19
16461	TC 250/5 tropicalised transfo. for cables and busbars	19
16462	TC 300/5 tropicalised transformer for cables	19
16463	TC 400/5 tropicalised transfo. for cables and busbars	19
16464	TC 500/5 tropicalised transfo. for cables and busbars	19
16465	TC 600/5 tropicalised transfo. for cables and busbars	19
16468	TC 250/5 tropicalised transfo. for cables and busbars	19
16469	TC 300/5 tropicalised transfo. for cables and busbars	19
16470	TC 400/5 tropicalised transfo. for cables and busbars	19

Index of catalogue numbers (cont.)

Cat. no.	Description	Page
16471	TC 500/5 tropicalised transfo. for cables and busbars	19
16473	TC 500/5 tropicalised transformer for busbars	19
16474	TC 600/5 tropicalised transformer for busbars	19
16476	TC 200/5 tropicalised transformer for busbars	19
16477	TC 250/5 tropicalised transformer for busbars	19
16478	TC 300/5 tropicalised transformer for busbars	19
16479	TC 400/5 tropicalised transformer for busbars	19
16480	TC 500/5 tropicalised transformer for busbars	19
16483	TC 600/5 tropicalised transformer for busbars	19
16482	TC 800/5 tropicalised transformer for busbars	19
16483	TC 1000/5 tropicalised transformer for busbars	19
16500		
16500	TC 40/5 tropicalised transformer for cables	19
16534	TC 1250/5 tropicalised transformer for busbars	19
16535	TC 1500/5 tropicalised transformer for busbars	19
16537	TC 1250/5 tropicalised transformer for busbars	19
16538	TC 1500/5 tropicalised transformer for busbars	19
16540	TC 1250/5 tropicalised transformer for busbars	19
16541	TC 1500/5 tropicalised transformer for busbars	19
16542	TC 2000/5 tropicalised transformer for busbars	19
16543	TC 2500/5 tropicalised transformer for busbars	19
16544	TC 3000/5 tropicalised transformer for busbars	19
16545	TC 2500/5 tropicalised transformer for busbars	19
16546	TC 3000/5 tropicalised transformer for busbars	19
16547	TC 4000/5 tropicalised transformer for busbars	19
16548	TC 5000/5 tropicalised transformer for busbars	19
16549	TC 6000/5 tropicalised transformer for busbars	19
16550	Cylinder Ø 8.5 mm for TC transformer	19
16551	Cylinder Ø 12.5 mm for TC transformer	19
16552	Lead-sealable cover for TC transformer	19
16553	Lead-sealable cover for TC transformer	19
17000		
17065	ME1 digital kilowatt-hour meter	39
17066	ME1z digital kilowatt-hour meter	39
17067	ME1zr digital kilowatt-hour meter	39
17070	ME4 digital kilowatt-hour meter	39
17071	ME4zr digital kilowatt-hour meter	39
17072	ME4zrt digital kilowatt-hour meter	39
17075	ME3 digital kilowatt-hour meter	39
17076	ME3zr digital kilowatt-hour meter	39
A		
A9M17065	i ME1 digital kilowatt-hour meter	39
A9M17066	i ME1z digital kilowatt-hour meter	39
A9M17067	i ME1zr digital kilowatt-hour meter	39
A9M17075	i ME3 digital kilowatt-hour meter	39
A9M17076	i ME3zr digital kilowatt-hour meter	39
A9M17072	i ME4zrt digital kilowatt-hour meter	39
A9M17070	i ME4 digital kilowatt-hour meter	39
A9M17071	i ME4zr digital kilowatt-hour meter	39

Cat. no.	Description	Page
B		
BCPMA084S	84 circuit BCPM 3/4" CT spacing - Advanced	51
BCPMA184S	85 circuit BCPM 1" CT spacing - Advanced	51
BCPMA042S	42 circuit BCPM 3/4" CT spacing - Advanced	51
BCPMA142S	43 circuit BCPM 1" CT spacing - Advanced	51
BCPMB084S	84 circuit BCPM 3/4" CT spacing - Intermediate	51
BCPMB184S	85 circuit BCPM 1" CT spacing - Intermediate	51
BCPMB042S	42 circuit BCPM 3/4" CT spacing - Intermediate	51
BCPMB142S	43 circuit BCPM 1" CT spacing - Intermediate	51
BCPMC084S	84 circuit BCPM 3/4" CT spacing - Basic	51
BCPMC184S	85 circuit BCPM 1" CT spacing - Basic	51
BCPMC042S	42 circuit BCPM 3/4" CT spacing - Basic	51
BCPMC142S	43 circuit BCPM 1" CT spacing - Basic	51
BCPMSCA30S	30 circuit BCPM feature set A circuit splite core CT	51
BCPMSCA42S	42 circuit BCPM feature set A circuit splite core CT	51
BCPMSCA60S	60 circuit BCPM feature set A circuit splite core CT	51
BCPMSCA84S	84 circuit BCPM feature set A circuit splite core CT	51
BCPMSCB30S	30 circuit BCPM feature set B circuit splite core CT	51
BCPMSCB42S	42 circuit BCPM feature set B circuit splite core CT	51
BCPMSCB60S	60 circuit BCPM feature set B circuit splite core CT	51
BCPMSCB84S	84 circuit BCPM feature set B circuit splite core CT	51
BCPMSCC30S	30 circuit BCPM feature set C circuit splite core CT	51
BCPMSCC42S	42 circuit BCPM feature set C circuit splite core CT	51
BCPMSCC60S	60 circuit BCPM feature set C circuit splite core CT	51
BCPMSCC84S	84 circuit BCPM feature set C circuit splite core CT	51
C		
CAB4	PM/CM <-> display connection cable (1.25 m)	83
CAB12	PM/CM <-> display connection cable (3.65 m)	83
CAB30	PM/CM <-> display connection cable (9.14 m)	83
CD-TECHDOC	Compact disc containing the latest version of technical documentation for ION technology hardware and software	155
E		
EGX100MG	EGX100 Ethernet gateway	133
EGX300	EGX300 Ethernet server	133
I		
IE60-BASE-ENG	PowerLogic ION Enterprise base software	155
IE60-BASE-ENG-UPG	PowerLogic ION Enterprise base upgrade	155
IE60-CL	PowerLogic ION Enterprise client licence	155
IE60-CL-UPG	PowerLogic ION Enterprise client licence upgrade	155
IE60-DL-E	PowerLogic ION Entreprise device licence	155
IE60-DL-E-UPG	PowerLogic ION Entreprise device upgrade	155
IE60-DL-M	PowerLogic ION Entreprise device licence	155
IE60-DL-M-UPG	PowerLogic ION Entreprise device upgrade	155
IE60-DL-S	PowerLogic ION Entreprise device licence	155
IE60-DL-S-UPG	PowerLogic ION Entreprise device upgrade	155
IONE-OPC-V1	OPC server version 1.0	155

Index of catalogue numbers (cont.)

Cat. no.	Description	Page
IONE-PQDIF-V1	Exporter version 1.0	155
IONE-SQL-2005	Integrated SQL Server 2005 Option – Server Licence for 1 CPU	155
IONE-SQL-2005-CPU	Additional CPU License for Integrated SQL Server 2005	155
M		
M7550	ION7550 energy and power quality meter	95, 135
M7650	ION7650 energy and power quality meter	95
M8600A	ION8600A energy and power quality meter	103, 112
M8600B	ION8600B energy and power quality meter	103, 112
M8600C	ION8600C energy and power quality meter	105
M8800A	ION8800A energy and power quality meter	120
M8800B	ION8800B energy and power quality meter	120
M8800C	ION8800C energy and power quality meter	120
METSEDM6000	DM6000 panel digital meter	33
METSEDM6200	DM6000 panel digital meter plus communications	33
METSEPM1000	PM1000 power meter	60
METSEPM1200	PM1000 power meter plus communications	60
O		
OPTICAL-PROBE	Optical communication interface	108, 117
P		
PLS101110	PowerLogic SCADA server licence	161
PLS101111	PowerLogic SCADA server licence	161
PLS101112	PowerLogic SCADA server licence	161
PLS101113	PowerLogic SCADA server licence	161
PLS101114	PowerLogic SCADA server licence	161
PLS101115	PowerLogic SCADA server licence	161
PLS101199	PowerLogic SCADA server licence	161
PLS102010	PowerLogic SCADA control client licences	161
PLS102011	PowerLogic SCADA control client licences	161
PLS102012	PowerLogic SCADA control client licences	161
PLS102013	PowerLogic SCADA control client licences	161
PLS102014	PowerLogic SCADA control client licences	161
PLS102015	PowerLogic SCADA control client licences	161
PLS102088	PowerLogic SCADA control client licences	161
PLS102099	PowerLogic SCADA control client licences	161
PLS102210	PowerLogic SCADA Web control client licences	161
PLS102211	PowerLogic SCADA Web control client licences	161
PLS102212	PowerLogic SCADA Web control client licences	161
PLS102213	PowerLogic SCADA Web control client licences	161
PLS102214	PowerLogic SCADA Web control client licences	161
PLS102215	PowerLogic SCADA Web control client licences	161
PLS102288	PowerLogic SCADA Web control client licences	161
PLS102299	PowerLogic SCADA Web control client licences	161
PLS103088	PowerLogic SCADA view only client licence	161
PLS103099	PowerLogic SCADA view only client licence	161
PLS103288	PowerLogic SCADA Web view only client licence	161
PLS103299	PowerLogic SCADA Web view only client licence	161
PLS109101	PowerLogic SCADA key reprogramming	162
PLS109102	PowerLogic SCADA Tech Support	162
PLS109103	PowerLogic SCADA Tech Support	162
PLS109122	PowerLogic SCADA Tech Support	162
PLS109139	PowerLogic SCADA Tech Support	162
PLS109140	PowerLogic SCADA Tech Support	162
PLS109141	PowerLogic SCADA Tech Support	162
PLS109911	PowerLogic SCADA software and one key in a box	161
PLS109912	PowerLogic SCADA software and one key in a box	161
PLS109921	PowerLogic SCADA software and one key in a box	161
PLS109922	PowerLogic SCADA software and one key in a box	161
PLVDEVKITENG	English PowerView software	147
PLVDEVKITESP	Spanish PowerView software	147
PLVDEVKITFRA	French PowerView software	147
PM200	PM200 power meter	67
PM200MG	PM200 power meter	67
PM200P	PM200 power meter	67
PM200PMG	PM200 power meter with pulse outputs	67
PM210	PM210 power meter	67
PM210MG	PM210 power meter	67
PM700MG	PM700 Power Meter	73
PM700PMG	PM700P Power Meter	73
PM700SD	PM700 power meter	73
PM710MG	PM710 Power Meter	73
PM710SD	PM710 power meter	73
PM72DINRAILKIT	DIN-rail mounting kit for PM200 and PM700 power meters	67, 73
PM750HWKIT	Set of connectors replacement (PM750 only)	73
PM750MG	PM750 Power Meter	73
PM750SD	PM750 power meter	73
PM7AND2HWKIT	Set of connectors for PM200 and PM700 power meters	67, 73
PM810	PM810 power meter	82
PM810LOG	Optional logging module for on-board data recording for PM830	83
PM810MG	PM830 Power Meter with integrated display	82
PM830RD	PM830 power meter	82
PM810RDMG	Meter and remote display kit	82
PM810U	PM810 power meter	82
PM810UMG	PM810 power meter	82
PM820	PM820 power meter	82
PM820MG	PM820 Power Meter with integrated display	82
PM820RD	PM820 power meter	82
PM820RDMG	PM820 power meter	82
PM820U	PM820 power meter	82
PM820RDMG	Meter and remote display kit	82
PM820UMG	PM820 Power Meter without display	82
PM850MG	PM850 Power Meter with integrated display	82

Index of catalogue numbers (cont.)

Cat. no.	Description	Page
PM850RD	PM850 power meter	82
PM850RDMG	Meter and remote display kit	82
PM850U	PM850 power meter	82
PM850UMG	PM850 Power Meter without display	82, 161
PM870	PM870 power meter	82
PM870MG	PM870 Power Meter with integrated display	82
PM870RD	PM870 power meter	82
PM870RDMG	Meter and remote display kit	82
PM870U	PM870 power meter	82
PM870UMG	PM870 Power Meter without display	82
PM8ECC	PM8ECC module for PM Series 800	83
PM8M22	PM8M22 module for PM Series 800	83
PM8M2222	PM8M2222 module for PM Series 800	83
PM8M26	PM8M26 module for PM Series 800	83
PM8RD	PM8RD power meter	82
PM8RDA	Remote display adapter only	82
PM8RDMG	Remote display and adapter with a 3.55 m cable	82
R		
RJ11EXT	RJ11 Extender kit to mount RJ11 jack in panel door	83

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:

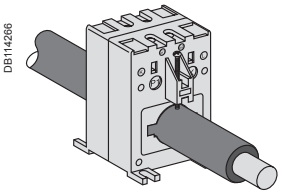
- cable current transformers
- bar current transformers.

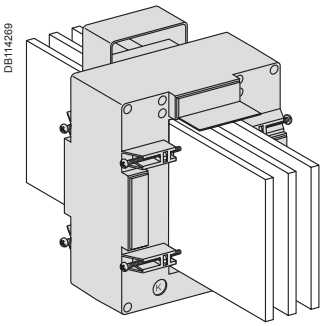
This allows them to be used in combination with measurement instruments: ammeters, kilowatt-hour meters, measurement units, control relays, etc.

Common technical data

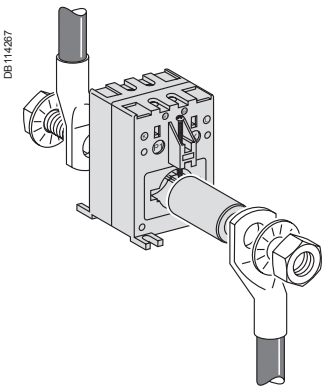
- Secondary current: 5 A
- Max. voltage rating Ue: 720 V
- Frequency: 50/60 Hz
- Safety factor (sf):
  - 40 to 4,000 A : sf ⩽ 5
  - 5,000 to 6,000 A : sf ⩽ 10.
- Degree of protection: IP20
- Operating temperature: tropicalised range, -25 °C to +60 °C, relative humidity > 95 %
- Compliance with standards: IEC 60044-1 and VDE 0414
- Secondary connection (as per model):
  - by terminals for lug
  - by tunnel terminals
  - by screws.

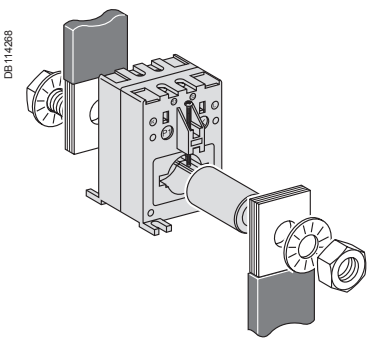
Connection





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) (mm²)	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**
PM700, PM800, CM3000, CM4000	**0.15**
ME4zrt	**0.05**
PM9	**0.55**

Example: consumption of a measurement system at 20 °C

PM9		0.55 VA
4 meters of 2.5 mm^2 doubled wires	+	1.64 VA
i.e. a measurement system consumption	=	**2.19 VA**

Based on the result, the CT accuracy class is determined (see previous page):
- class 3 for a 75/5 ratio CT
- class 1 for a 100/5 ratio CT
- class 0.5 for a 125/5 ratio CT.

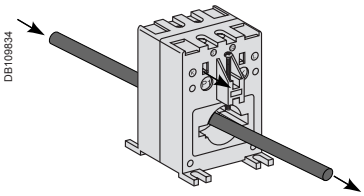
CT current transformers (cont.)

Specific case of the motor starter

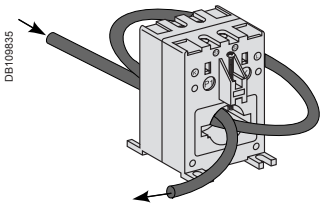
To measure motor starter current, you must choose a CT with primary current Ip = Id/2 (Id = motor starting current).

Practical advice

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



50/5 A CT: Imax = 50 A

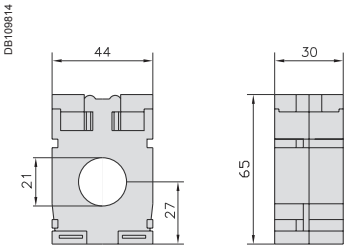


100/5 A CT, 2 cable openings: Imax = 50 A

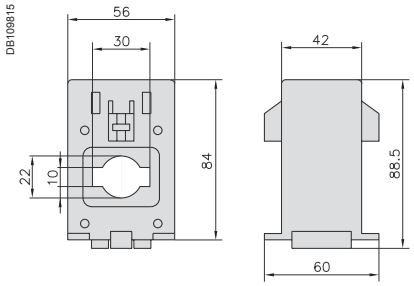
To divide by 2 the nominal current of a transformer, you only need to pass the current to be measured twice through this transformer.

Dimensions

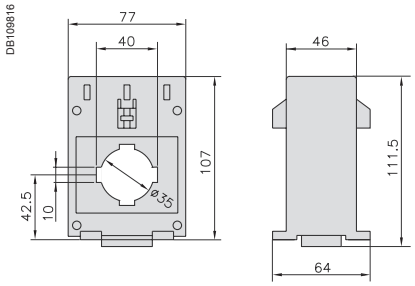
CT current transformers



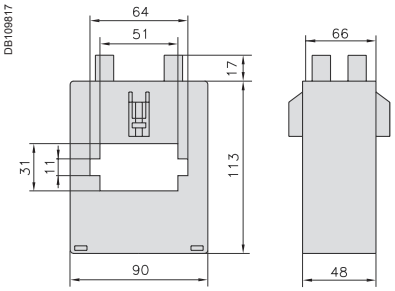
Cat. no. 16500, 16451 to 16456



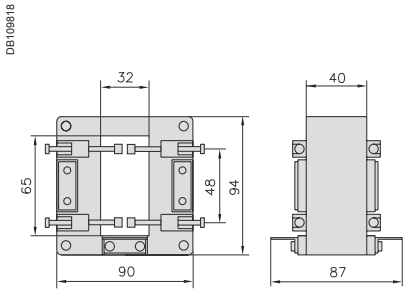
Cat. no. 16459 to 16465



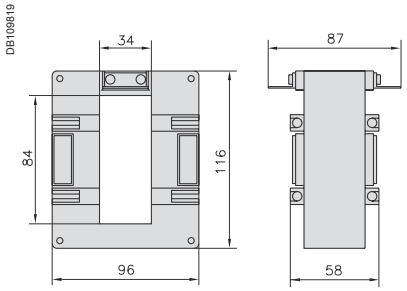
Cat. no. 16468 to 16471



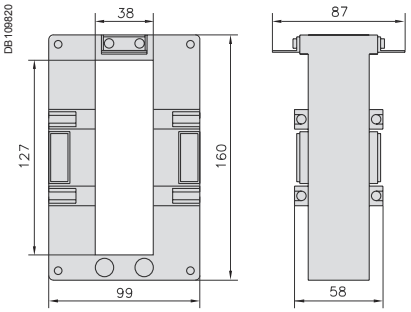
Cat. no. 16473 and 16474



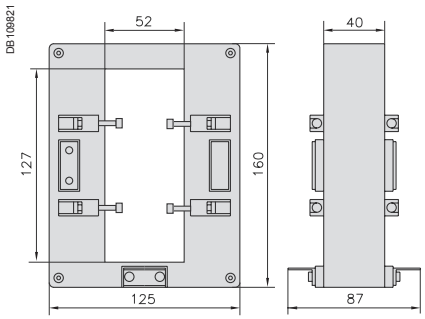
Cat. no. 16534 to 16535, 16476 to 16483



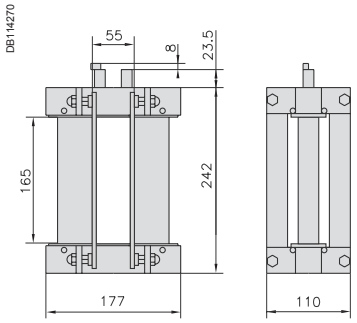
Cat. no. 16537 and 16538



Cat. no. 16540 to 16544

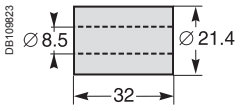


Cat. no. 16545 to 16547



Cat. no. 16548 and 16549

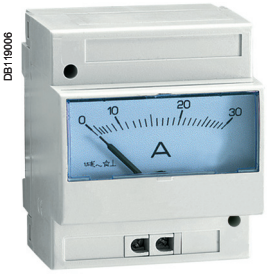
Cylinders



Cat. no. 16550

Cat. no. 16551

DIN rail analogue ammeters and voltmeters



AMP.

VLT.

Function

AMP

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

VLT

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.
AMP with direct connection				
	0-30 A	no	8	**16029**
AMP 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**
VLT				
	0-300 V		8	**16060**
	0-500 V		8	**16061**

DIN rail digital ammeters, voltmeter and frequency meter

AMP.

VLT.

FRE.

Function

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

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

FRE
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.

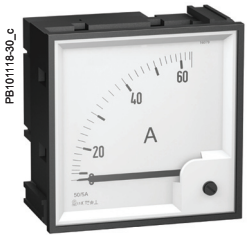
Frequency meter
- Minimum value measured: 20 Hz.
- Maximum value measured: 100 Hz.
- Full-scale display: 99.9 Hz.

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

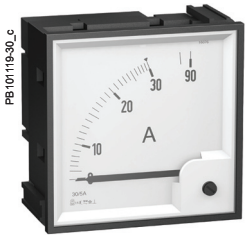
Catalogue numbers

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

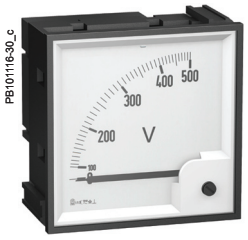
72 x 72 analogue ammeters and voltmeter



AMP for standard feeder.



AMP for motor feeder.



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.

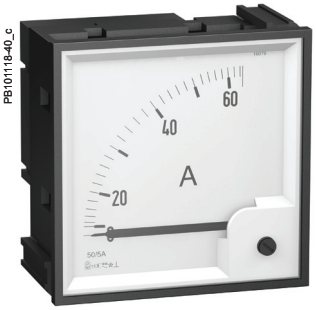
VLT specific technical data

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

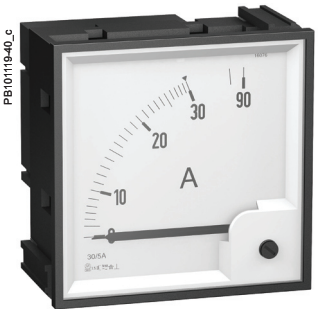
Catalogue numbers

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**

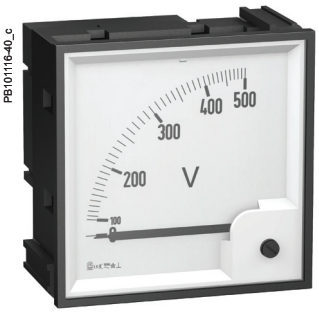
96 x 96 analogue ammeters and voltmeter



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

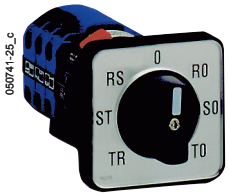
- Consumption: 3 VA.
- Permanent overload: 1.2 Un.
- Maximum overload for 5 s: 2 Un.

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.

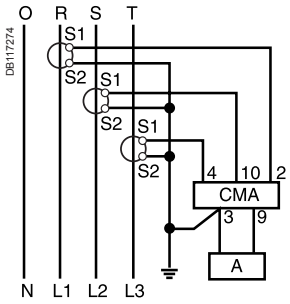
Common technical data

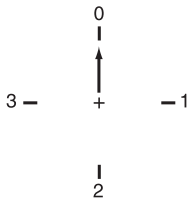
- ■ Durability:
  - □ electrical: 100 000 operations
  - □ mechanical: 2 000 000 operations.
- ■ AgNi contact.
- ■ Operating temperature: -25 °C to +50 °C.
- ■ Compliance with standards IEC/EN 60947-3.
- ■ Degree of protection:
  - □ IP65 on front face
  - □ IP20 at terminal level.

Catalogue numbers

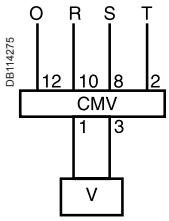
Type	Rating (A)	Voltage (V)	Number of positions	Cat. no.
CMA	20		4	**16017**
CMV		500	7	**16018**

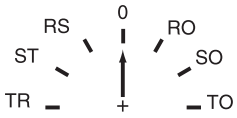
Connection





CMA.



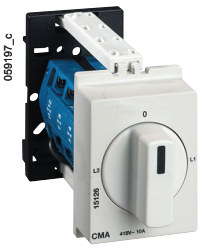


CMV.

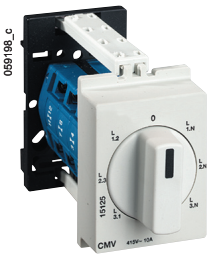
Reading 3 phase-to-earth voltages + 3 phase-to-phase voltages.

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

DIN rail CMA and CMV selector switches



CMA.



CMV.

Function

CMA

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

CMV

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.

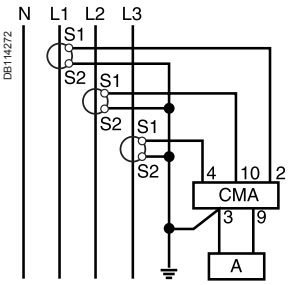
Common technical data

- 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.

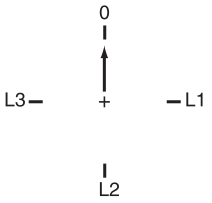
Catalogue numbers

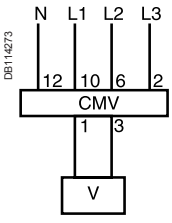
Type	Rating (A)	Voltage (V AC)	Width in mod. of 9 mm	Cat. no.
CMA	10	415	4	**15126**
CMV	10	415	4	**15125**

Connection

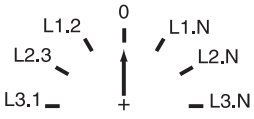


CMA.

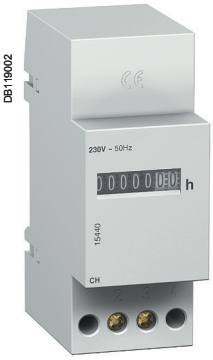




CMV.



CH hour counters



CH "DIN".

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

CH "DIN"

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

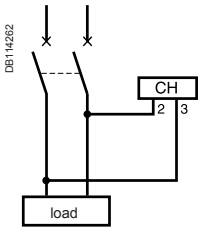
CH "48 x 48"

- 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.

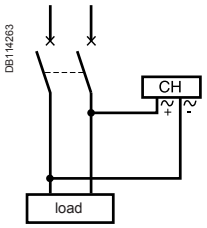
Catalogue numbers

Type	Voltage (V)	Width in mod. of 9 mm	Cat. no.
CH "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



CH "DIN".



CH "48 x 48".

CI impulse counter

Function

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

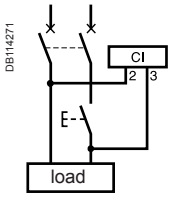
Common technical data

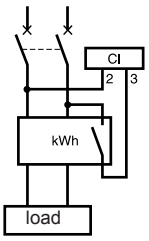
- ■ Supply and metering voltage: 230 V AC ± 10%, 50/60 Hz.
- ■ Consumption: 0.15 VA.
- ■ Maximum display: 9 999 999 impulses.
- ■ Without reset.
- ■ Metering data:
- □ minimum impulse time: 50 ms
- □ minimum time between 2 impulses: 50 ms.
- ■ Storage temperature: -25 °C to +85 °C.
- ■ Operating temperature: -10 °C to +70 °C.
- ■ Connection: tunnel terminals for 2.5 mm² cable.

Catalogue number

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

Connection

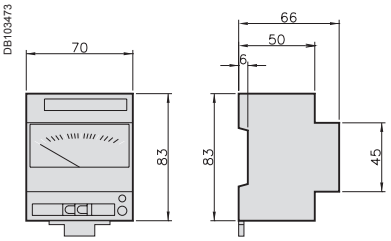




Dimensions

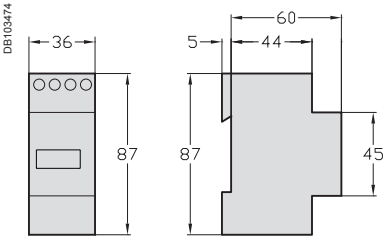
Analog ammeters and voltmeters

DB103473



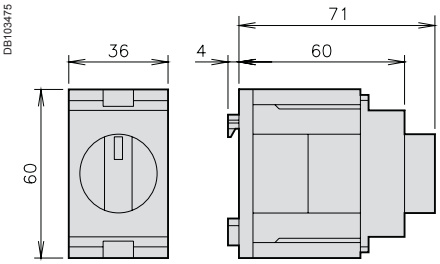
Digital ammeters, voltmeter and frequency meter

DB103474



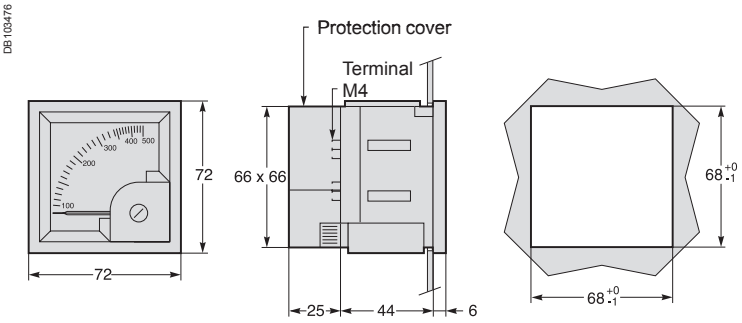
CMA and CMV selector switches

DB103475



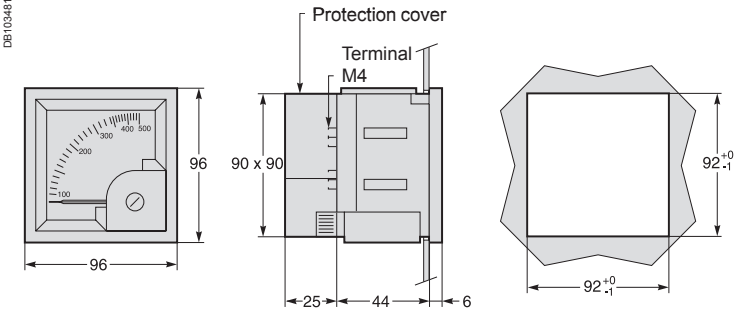
72 x 72 analog ammeters and voltmeter

DB103476



96 x 96 analog ammeters and voltmeter

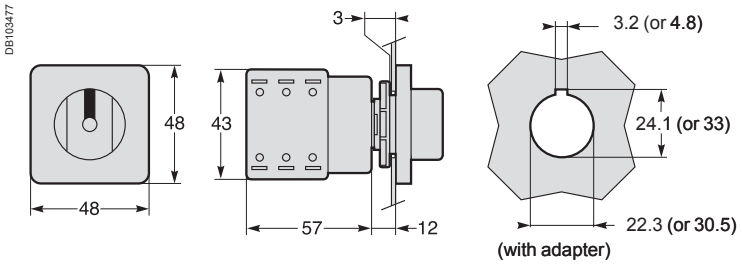
DB103481



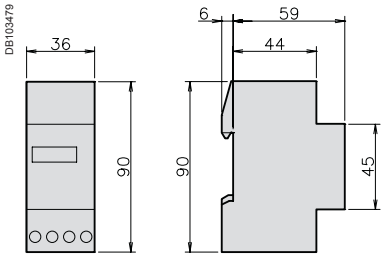
Dimensions (cont.)

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

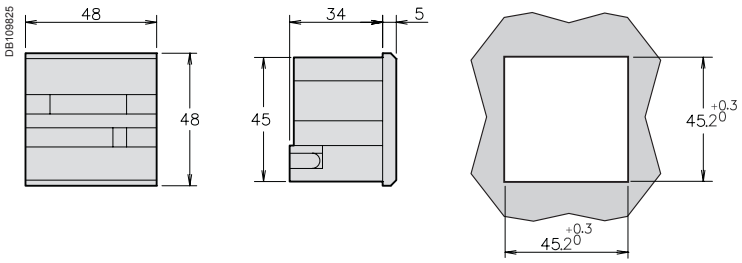
48 x 48 CMA and CMV selector switches



CI impulse counter and CH hour counter



48 x 48 CH hour counters



DM6000 series
Functions and characteristics

PE86238-54

PE86261-54

DM6000 series digital panel meter front display (above), and rear (below)

The PowerLogic DM6000 series digital panel meters offer the basic measurement capabilities required to monitor an electrical installation.

Characterized by their rugged construction, compact size, and low installation costs, these state-of-the-art meters are ideal for control panels, motor control centres and genset panels.

The PowerLogic DM6000 series digital meter is available in two different versions to better fit specific applications:
DM6000, basic version;
DM6200, basic version plus an RS485 port for Modbus communication.

Applications

Power monitoring operations.
Equipment monitoring.
Preventive maintenance.

Main characteristics

Easy to read display
The bright, alphanumeric 15mm high LED display provides 3 lines for measurement values with 4 digits per line. This display auto-scales for Kilo, Mega and Giga values. Auto scrolling mode allows for easy reading.

Analogue load bar
The colour-coded analogue load bar indicates the percentage of load through 12 LED segments.

Turbo Key access to information
The Turbo Key gives access to the most commonly viewed parameters or enter set up mode with a single push of the button.

Quick and easy installation
Setup is done through the front panel keys. Quick entry to setup during power up by TURBO key. Direct connection for metering voltage inputs up to 480 Vac L-L.

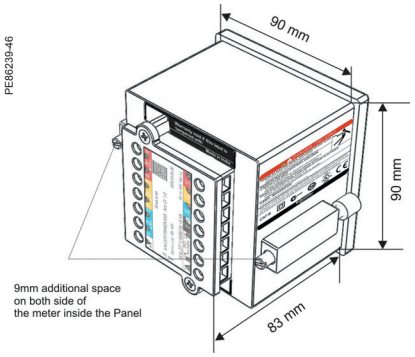
Colour-coded terminal board labeling
The colour-coded label on the terminal board helps ensure accurate wiring.

Secure settings
Safeguard access to setup parameters with unique password protection. A keypad lock lets you display a user-selected page by default.

Part numbers

Description	Schneider Electric
DM6000 digital meter with basic readings; no communications	**METSEDM6000**
Same as DM6000 plus an RS485 communication port	**METSEDM6200**

DM6000 series
Functions and characteristics (cont.)



PowerLogic DM6000 series digital panel meter dimensions.

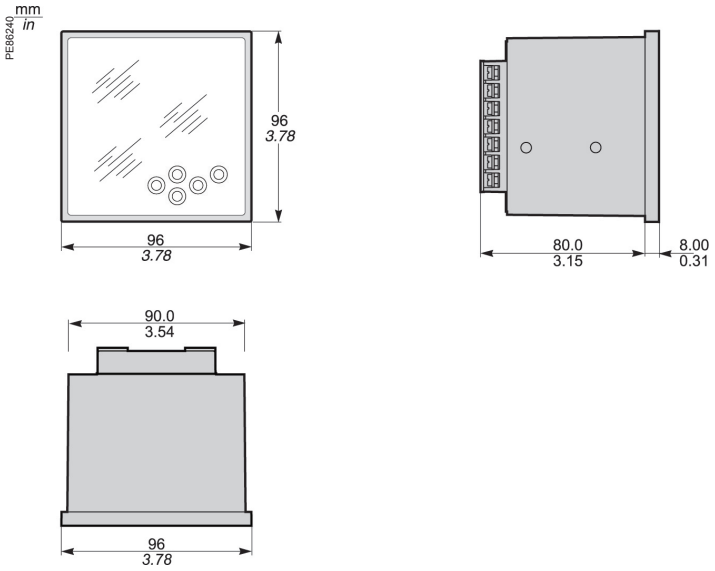
Selection guide		DM6000	DM6200
General			
Use on LV and HV systems		■	■
Current and voltage accuracy		1.0 %	1.0 %
Number of samples per cycle		20 at 50 Hz	20 at 50 Hz
Instantaneous rms values			
Current	Per phase & Neutral	■	■
Voltage	Average Phase to Neutral & Phase to Phase	■	■
Frequency		■	■
Power factor	Average & per phase	■	■
Unbalance	Current, voltage	■	■
Phase angle	Between V & I, Ph1, Ph2, Ph3	■	■
RPM	For generator only, speed calculated on generator voltage output and number of machine poles.	■	■
Other measurements			
ON hours	Operating time for meter in hours	■	■
INTR	Number of interruptions	■	■
Display			
LED display		■	■
Communication			
RS-485 port		-	1
Modbus protocol		-	■

DM6000 series
Functions and characteristics (cont.)

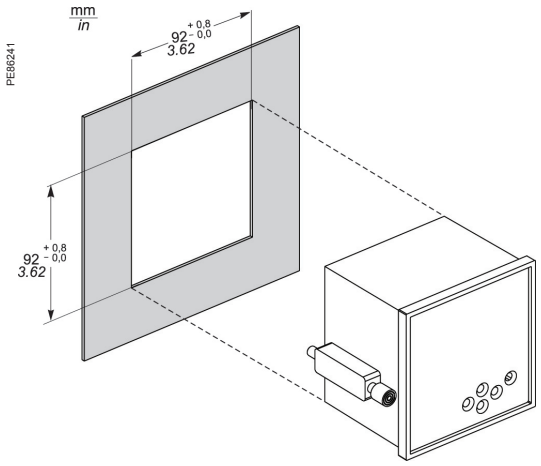
Electrical characteristics			
Type of measurement			True RMS up to the 9th harmonic 20 samples per cycle at 50 Hz
Measurement accuracy*	Current and voltage		1.0 % of reading
	Frequency		0.1 % of reading
	Power factor		1.0 % of reading
* Additional error of 0.05% of full scale, for meter input current below 100mA			
Data update rate			1 second
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
	Permissible overload		1.10 Un (480 V L-L)
	Burden		0.2 VA per phase max.
	Impedance		VLL - 4 Mohms, VLN – 2 Mohms
	Frequency range		45 - 65 Hz
Input-current characteristics	CT ratings	Primary	1 A - 99.0 kA
		Secondary	1 A - 5 A
	Measurement range		50 mA - 6 A (5 mA is the starting)
	Permissible overload		10 A continuous
	Burden		0.2 VA per phase max.
	Impedance		< 0.1 ohm
Power supply	AC		44 - 277 V AC at 50 Hz/60 Hz
	DC		44 - 277 V DC
	Ride-through time		100 ms at 50V
	Burden		3 VA max.
Mechanical characteristics			
Weight			0.500 kg (shipping), 0.400 kg (unpacked)
IP degree of protection			Front: IP 51; Back: IP 40
Dimensions			Bezel: 96 x 96 mm Depth: 80 mm behind bezel Panel cutout: 92 x 92 mm
Environmental conditions			
Operating temperature			-10°C to +60°C
Storage temperature			-25°C to +70°C
Humidity rating			5 to 95 % RH non-condensing
Altitude			2000 m
Measurement CAT			III
Pollution degree			2
Protection class			2
Electromagnetic compatibility			
Electrostatic discharge			IEC 61000-4-2
Immunity to electromagnetic RF fields			IEC 61000-4-3
Immunity to electrical fast transients			IEC 61000-4-4
Immunity to surge waves			IEC 61000-4-5
Conducted disturbance immunity			IEC 61000-4-6
Damped oscillatory waves immunity			IEC 61000-4-12
Impulse voltage withstand			6kV for 1.2/50 µS per IEC 60060-1
Conducted and radiated emissions			CISPR11 Class A, FCC Part 15 Class A
Safety and standards			
Safety construction			Self extinguishable V0 plastic; UL 508
CE certification IEC61010			Yes
Complies with Regulation (EC) n° 1907/2006 of Dec 18 2006 named REACH (related to the Registration, Evaluation, Authorization and restrictions applicable to Chemical substances)			
Communication			
RS-485 port			2 terminals only; Baud rate up to 19,200 bps Protocols: Modbus RTU
Display characteristics			
Integrated LED display			View 3 parameters together on 3 line, 4 digits per line display. Auto-scaling capability for Kilo, Mega, and Giga values. User-selectable default display page. Password protection for setup parameters.
Analogue load bar			Colour-coded analogue indicator provides an option to select the full scale of the load bar based on the sanctioned power limit

DM6000 series
Installation and connections

DM6000 series meter dimensions

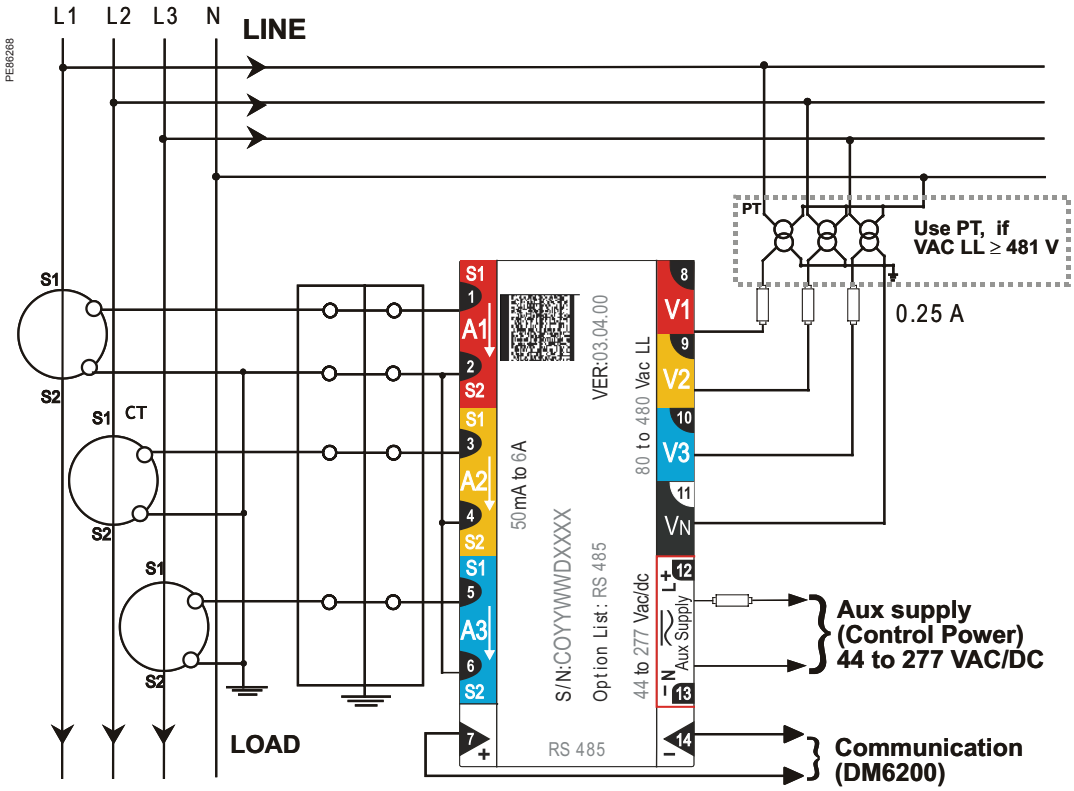


Front-panel mounting



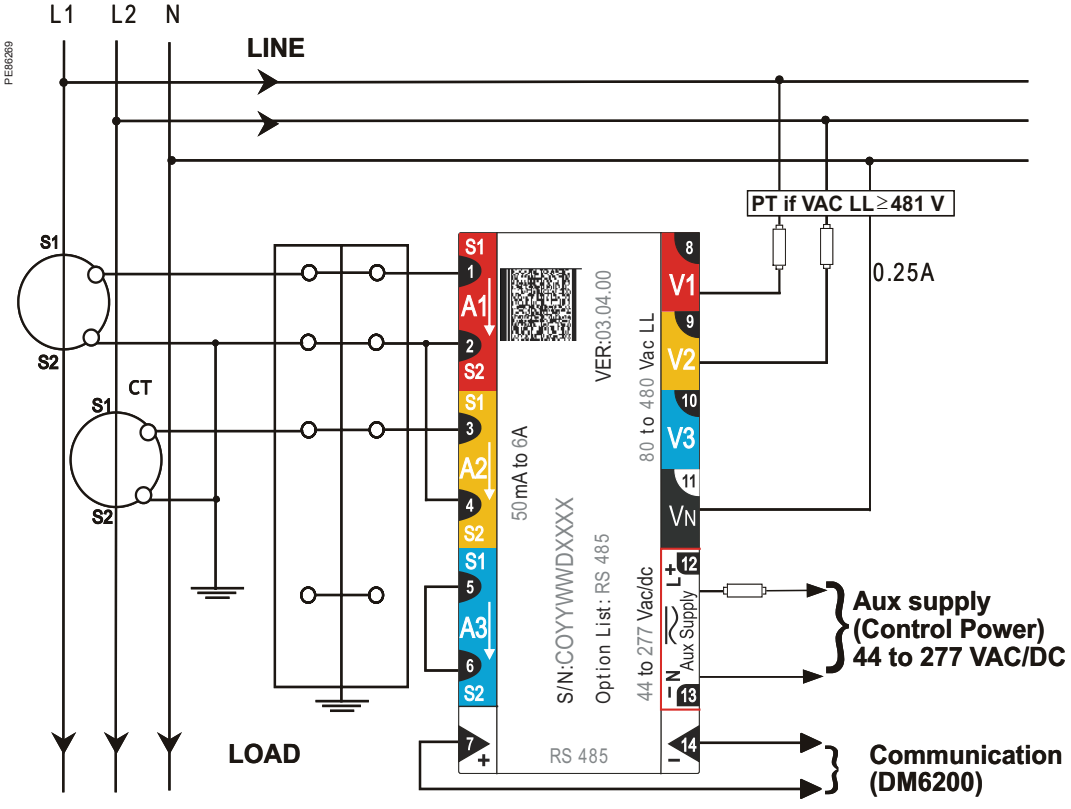
DM6000 series
Installation and connections (cont.)

3 phase 4-wire WYE connection with 3CTs and 3PTs



Connection representation only. Other types of connection are possible.
Refer to the DM6000 series Quick Start Guide for details.

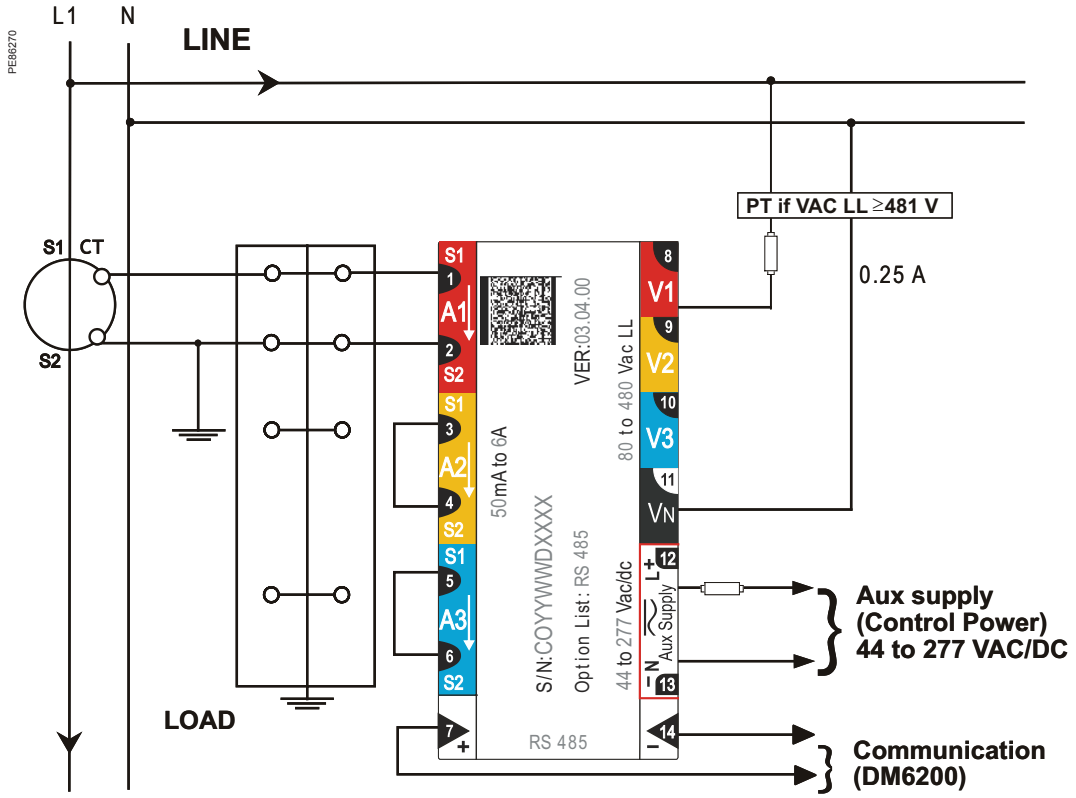
2 phase 3-wire connection with 2 CTs



Connection representation only. Other types of connection are possible.
Refer to the DM6000 installation guide for details.

DM6000 series
Installation and connections (cont.)

Single phase connection



Connection representation only. Other types of connection are possible.
Refer to the DM6000 series Quick Start Guide for details.

Kilowatt-hour meters


PB103992-35

EN'clic.


PB103993-35

EN40.


PB103994-35

EN40p.


PB103457_SE-35

ME1zr.


PB103459_SE-35

ME3zr.


PB103462_SE-35

ME4zrt.

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.

EN'clic
40 A DuoLine single-phase kilowatt-hour meter.

EN40
40 A single-phase kilowatt-hour meter.

EN40p
40 A single-phase kilowatt-hour meter with remote transfer of metering impulses (static output).

iME1 / ME1
Single-phase kilowatt-hour meter.

iME1z / ME1z
Single-phase kilowatt-hour meter with partial meter.

iME1zr / ME1zr
Single-phase kilowatt-hour meter with partial meter and remote transfer of metering impulses (relay output).

iME3 / ME3
Three-phase kilowatt-hour meter without neutral.

iME3zr / ME3zr
Three-phase kilowatt-hour meter without neutral, with partial meter and remote transfer of metering impulses (relay output).

iME4 / ME4
Three-phase + neutral kilowatt-hour meter.

iME4zr / ME4zr
Three-phase + neutral kilowatt-hour meter with partial meter and remote transfer of metering impulses (relay output).

ME4zrt
Three-phase kilowatt-hour meter with or without neutral associated with external CTs (not supplied), with partial meter and remote transfer of metering impulses (relay output).

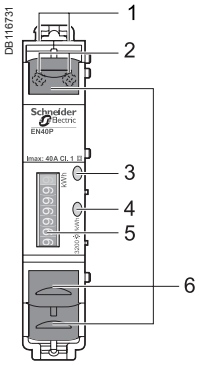
Catalogue numbers

Type	Cat. no.	Type	Cat no.	Rating (A)	Voltage (V AC)	Tolérance (V AC)	Width in mod. of 9 mm
Single-phase circuit (1L + N)							
		EN'clic	**15237**	40	230	±20	2
		EN40	**15238**	40	230	±20	2
		EN40p	**15239**	40	230	±20	2
iME1	**A9M17065**	**ME1**	**17065**	63	230	±20	4
iME1z	**A9M17066**	**ME1z**	**17066**	63	230	±20	4
iME1zr	**A9M17067**	**ME1zr**	**17067**	63	230	±20	4
Three-phase circuit (3L)							
iME3	**A9M17075**	**ME3**	**17075**	63	3 x 400-3 x 230	±20	8
iME3zr	**A9M17076**	**ME3zr**	**17076**	63	3 x 400-3 x 230	±20	8
iME4zrt	**A9M17072**	**ME4zrt**	**17072**	40...6000	3 x 400-3 x 230	±20	8
Three-phase + neutral circuit (3L + N)							
iME4	**A9M17070**	**ME4**	**17070**	63	3 x 230/400	±20	8
iME4zr	**A9M17071**	**ME4zr**	**17071**	63	3 x 230/400	±20	8
		ME4zrt	**17072**	40...6000	3 x 230/400	±20	8

Main technical data

	ME	EN'clic / EN40 / EN40p
Accuracy class	1	1
Frequency	48/62 Hz	48/62 Hz
Consumption	2.5 VA	< 10 VA
Operating temperature	-25°C to +55°C	-25°C to +55°C -25°C to +65°C (32 A)
Connection by tunnel terminals	Top terminals: 6 mm^2	Top terminals: 4 mm^2
	Bottom terminals: 16 mm^2	Bottom terminals: 10 mm^2
Compliance with standard	IEC 61557-12 : - PMD/DD/K55/1 - PMD/SD/K55/1 (ME4zrt)	IEC 62053-21 / IEC 61557-12 : - PMD/DD/K55/1
	IEC 62053-21 (accuracy)	MID approval (Nov 2009)
Sealable screw shield	Except ME4zrt	Yes

Kilowatt-hour meters (cont.)

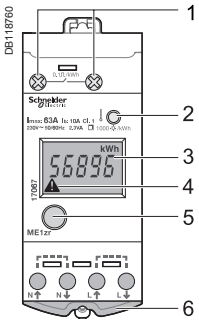


EN40p.

Description

EN'clic, EN40, EN40p

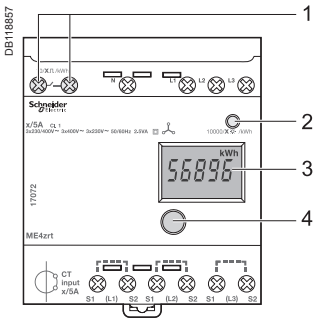
1 Allow the comb busbar to pass.
2 Remote transfer pulse output (EN40p).
3 Green power-on indicator light.
4 Yellow metering indicator light (flashing).
5 Display unit.
6 Seal.



MEzr.

ME1, ME1z, ME1zr

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



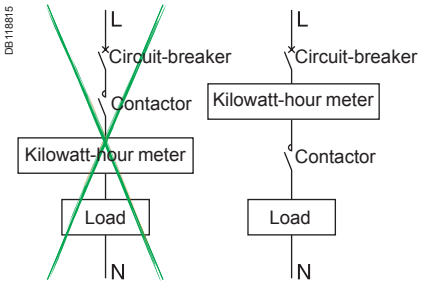
ME4zrt.

ME3, ME3zr, ME4, ME4zr, ME4zrt

1 Pulse output for remote transfer (ME3zr, ME4zr, ME4zrt).
2 Flashing meter indicator.
3 Total or partial meter display (ME3zr, ME4zr, ME4zrt) and CT rating display (ME4zrt).
4 Push-button: total or partial meter display (ME3zr, ME4zr, ME4zrt), reset partial meter, display or selection of CT rating (ME4zrt).

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.



Example: meter on a load switching

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

EN'clic, EN40, EN40p, ME1, ME1z and ME1zr specific technical data						
	EN'clic	**EN40**	**EN40p**	**ME1**	**ME1z**	**ME1zr**
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			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

ME3 and ME3zr specific technical data		
	ME3	**ME3zr**
Direct measurement	Up to 63 A	
Metering and activity indicator light (yellow)	100 flashes per kWh	
Total meter (max. capacity) on one phase	999.99 MWh	
Total meter display	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. 1 digit after the decimal point in kWh
Remote transfer	-	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) every 10 kWh

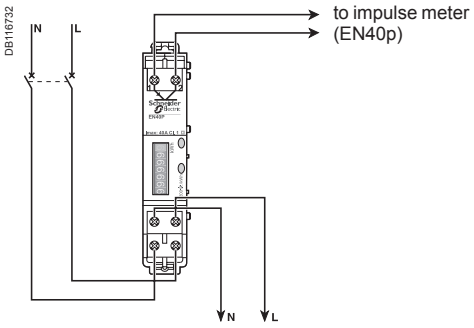
ME4, ME4zr and ME4zrt specific technical data			
	ME4	**ME4zr**	**ME4zrt**
Direct measurement	Up to 63 A		-
Measurement by CT	-		Ratio of 40/5 to 6,000/5 (configurable)
CT ratings choice	-		see page 39
Consumption of each measurement input	-		0.05 to 5 A
Metering and activity indicator light (yellow)	100 flashes per kWh		10,000/x flashes per kWh (1) (x = CT rating)
Total meter (max. capacity) on all 3 phases	999.99 MWh		Where CT ⩽ 150 A : 999.99 MWh Where CT > 150 A : 9,999.9 MWh
Total meter display	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 all 3 phases with RESET	-	99.99 MWh	Where CT ⩽ 150 A : 99.99 MWh Where CT > 150 A : 999.99 MWh
Partial meter display	-	In kWh or MWh with 4 significant digits. 1 digit after the decimal point in kWh	
Remote transfer	-	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) every 10 kWh	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 10/x impulse of 200 ms (contact closing) per kWh = x/10 kWh per impulse (2) (x = CT rating)

(1) example: 500/5 CT = 10,000/500 flashes per kWh = 20 flashes per kWh
(2) example: 500/5 CT = 500/10 kWh per impulse = 50 kWh per impulse

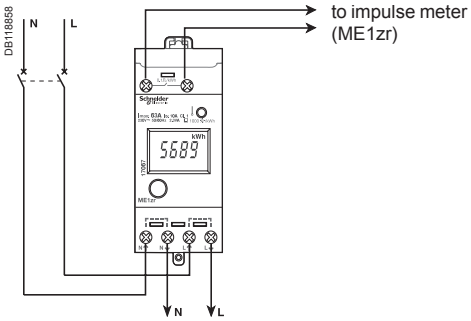
Kilowatt-hour meters (cont.)

Connection

Single-phase circuit

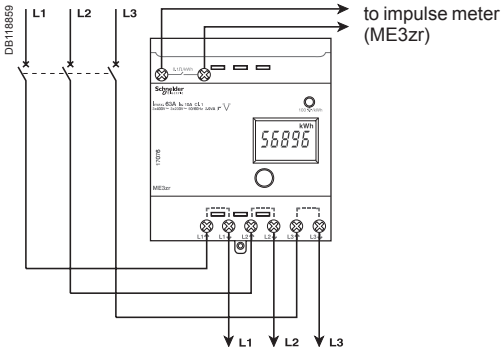


EN'clic / EN40 / EN40p.

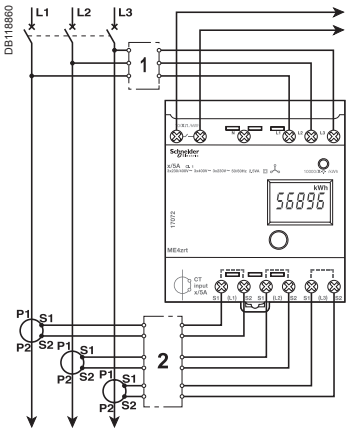


ME1 / ME1zr.

Three-phase circuit



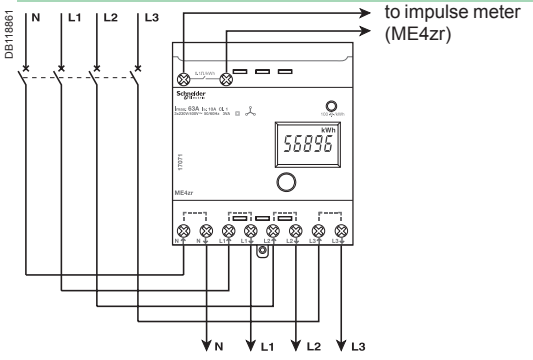
ME3 / ME3zr.



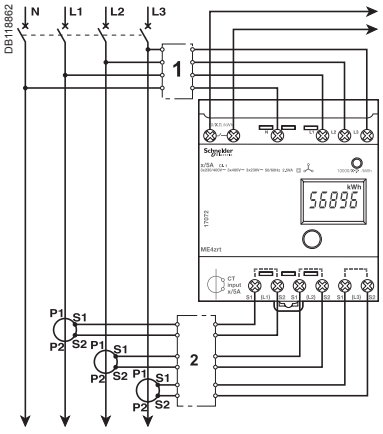
1 Protection (to be adapted to suit the short-circuit current at the connection point).
2 Shorting switch unit.

ME4zrt.

Three-phase + neutral circuit



ME4 / ME4zr.

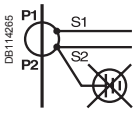


1 Protection (to be adapted to suit the short-circuit current at the connection point).
2 Shorting switch unit.

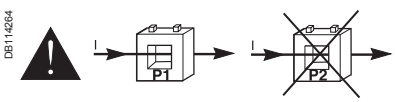
ME4zrt.

Caution

■ Do not earth the CT secondary (S2).

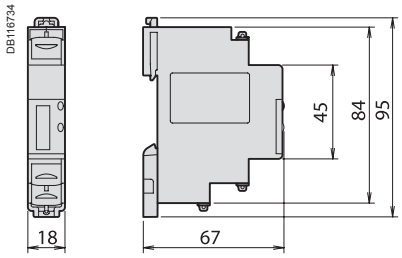


■ You must comply with the routing direction of power cables in the current transformer primary. Cables enter in "P1" and leave in "P2" to the loads.

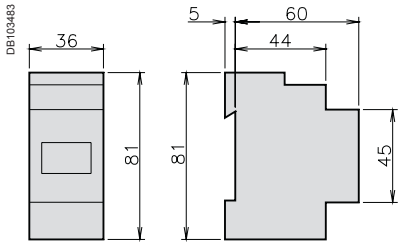


Dimensions

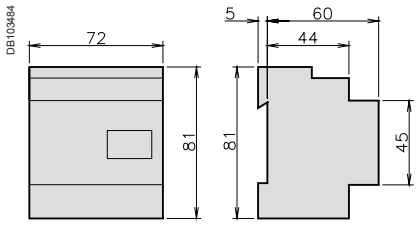
EN'clic, EN40 and EN40p kilowatt-hour meters



ME1, ME1z and ME1zr kilowatt-hour meters



ME3, ME3zr, ME4, ME4zr, ME4zrt kilowatt-hour meters



Product selection according to measurement functions

	Power Meter						
							
	BCPM	**PM9/PM9P/ PM9C**	**PM1000/PM1200**	**PM200/PM200P PM210**	**PM700/PM700P PM710**	**PM750**	**PM810/PM820/ PM850/PM870**
General selection criteria							
Installation	Inside panel	On DIN rail	Flush mount	Flush or DIN rail mount	Flush or DIN rail mount		Flush or DIN rail mount
Use on LV distribution systems	■	■	■	■	■		■
Use on LV and HV distribution systems	-	-			■		■
Current / voltage accuracy	1 %	0.5 %	1 %	0.5 %	0.5 %	0.4 % Current 0.3 % Voltage	0.5 % current 0.2% voltage
Power / active energy accuracy	1 %	1 %	Class 1 IEC 62052-11 Class 1 IEC 62053-21	Class 1 IEC 62053-21	Class 1 IEC 62053-21 Class 0.5S IEC 62053-22 (PM750)		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	■	■	■	signed	signed		■
■ Reactive	-	■	■	signed	signed		■
■ Apparent	-	■	■	■	■		■
Power per phase ■ Active	■	■	■	-	signed		■
■ Reactive	-	■	■	-	signed		■
■ Apparent	-	-	■	-	■		■
Power factor ■ Total	■	■	■	signed	signed		■
■ Per phase	■	-	■	-	-		■
Energy values							
Active energy	■	■	■	signed	signed		In/Out
Reactive energy	-	■	■	signed	signed		In/Out
Apparent energy	-	-	■	■	■		■
User-set accumulation mode	-	-	-	-	-		■
Demand values							
Current - Present and maximum values	■	-	■	Thermal	Thermal		■
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	Power demand only	Power demand only		■
Other measurements							
Hour counter	-	■	■	-	■		■

(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.)

											Micrologic for Compact NSX		Micrologic for Compact NS630b... 3200 Masterpact NT Masterpact NW				
																	
	ION 7550	ION 7650	ION8600 A	ION8600 B	ION8600 C	ION8650 A	ION8650 B	ION8650 C	ION8800 A	ION8800 B	ION8800 C	A	E	A	E	P	H
	DIN 192 standard cutout– 186x186 mm		ANSI socket, mount 9S, 35S, 36S; FT21switchboard case			ANSI socket, mount 9S, 35S, 36S; FT21switchboard case			DIN 43862 rack			Integrated in the circuit breaker		Integrated in the circuit breaker			
	■		■			■			■			■		■			
	■		■			■			■			-		-			
	0.1 % reading		0.1 % reading			0.1 % reading			0.1 % reading			Current 1% (1) Voltage 0.5%(1)		1.5% (1)			
	0.20 %		0.20 %			0.20 %			0.20 %			-	2.0 %(1)	-	2.0% (1)		
	■		■			■			■			■		■			
	■		■			■			■			■		■			
	■		-			-			-			-		■			
	■		■			■			■			-	■	-	■	■	
	■		■			■			■			-	■	-	■	■	
	■		■			■			■			-	■	-	-	■	
	■		■			■			■			-	■	-	■		
	■		■			■			■			-	■	-	■		
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	-		-						-			-	■	-	-	-	

Separate catalogue

Product selection according to measurement functions (cont.)

		Power Meter														
																
		BCPM	PM9/ PM9P/ PM9C	PM1000	PM1200	PM200	PM200P	PM210	PM700	PM700P	PM710	PM750	PM810	PM820	PM850	PM870
Power quality measurement																
Interharmonics		-	-	-		-			-				-			
Total harmonic distortion	Voltage	-	-	■		-			■				■			
	Current	-	-	■		-			■				■			
Individual harmonic content (current and voltage)		-	-	-		-			-				31 (1)	31	63	
Waveform capture		-	-	-		-			-				-	-	■	■ (2)
Detection of voltage sags and swells		-	-	-		-			-				-			■
Programmable (logic and mathematical functions)		-	-	-		-			-				-			
Detection & capture of transients		-	-	-		-			-				-			
Flicker		-	-	-		-			-				-			
EN 50160 compliance checking		-	-	-		-			-				-		■ (3)	
IEC 61000-4-30 compliance		-	-	-												
True rms measurement Maximum harmonic number		-	15	15		15			15				63			
Sampling rate Points per cycle		-	-	20 at 50 Hz		32			32				128			
Data recording																
Min/Max of instantaneous values		-	-	-		-			■				■			
Data logging		-	-	-		-			-				2 (1)	2	4	
Event logging		-	-	-		-			-				■ (1)	■		
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		-	-	-		-			-				80 kB (1)	80 kB	800 kB	
Display, sensors, inputs/ outputs																
Front-panel display		-	■	■		■			■				■			
Built-in current and voltage sensors		-	-	-		-			-				-			
Digital or analogue inputs (max. number)		-	-	-		-			-			2 digit	13 digit. / 4 analogue			
Pulse outputs		-	1 (PM9P)	-		-	2	-	-	2	-	1	1			
Digital or analogue outputs (max. number including pulse outputs)		-	1 (PM9P)	-		-	2 digit	-	-	2 digit	-	1 digit	5 digit. / 4 analogue			
Direct voltage connections without external VT		277 V L-N 480 V L-L	450 V	277 V L-N 480 V L-L		277 V L-N 480 V L-L			277 V L-N 480 V L-L				347 V L-N 600 V L-L			
Power supply																
AC/DC version	AC	90 - 277 V	230 V	44 - 277 V		100 to 415 V 50 Hz - 60 Hz			100 to 415 ±10% VAC, 5VA 50-60 Hz				115 to 415 ±10% VAC, 15 VA 45-67 Hz or 350-450 Hz			
	DC	-	-	44 - 277 V		125 to 250 V (+/- 20%)			125 to 250 ±20% VDC, 3W				125 to 250 ±20% VDC, 10W			
DC version		-	-	-		-			-				-			
Communication																
RS 485 port		■	■ (PM9C)	-	■	-		■	-		■		2- wire (on board) 4- wire (with remote display or PM8ECC)			
Infra-red port		-	-	-	-	-			-				-			
RS 232 port		-	-	-	-	-			-				With remote display			
Modbus (M)		M	M	-	■	-		M	-		M		M			
Ethernet port (Modbus/TCP/IP protocol)		-	-	-	-	-			-				Optional with PM8ECC Card			
HTML Web-page server		-	-	-	-	-			-				Optional with PM8ECC Card			
Ethernet gateway for other products on an RS 485 link		-	-			-			-				Optional with PM8ECC Card			

(1) With PM810LOG.
(2) Configurable.
(3) Except for interharmonics, signalling voltage, flicker and transients.
(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.)

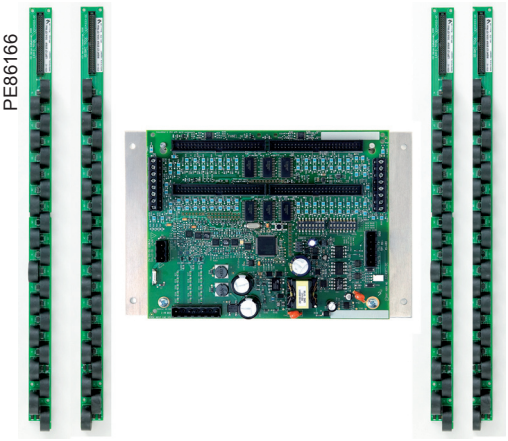
	ION 7550	ION 7650	ION8600 A	ION8600 B	ION8600 C	ION8650 A	ION8650 B	ION8650 C	ION8800 A	ION8800 B	ION8800 C	Micrologic for Compact NSX A	Micrologic for Compact NSX E	Micrologic for Compact NS630b... 3200 Masterpact NT Masterpact NW A	Micrologic for Compact NS630b... 3200 Masterpact NT Masterpact NW E	Micrologic for Compact NS630b... 3200 Masterpact NT Masterpact NW P	Micrologic for Compact NS630b... 3200 Masterpact NT Masterpact NW H
	-	■	-			-			■		-	-		-			-
	■		■			■			■			-	■	-			■
	■		■			■			■			-	■	-			■
	■		■			■			■			-		-			■
	-	■	■	-		■	-		■			-		-			■
	■		■			■			■			-		-			
	■		■			■			■			-		-			
	-	20 µs	78 µs	-		78 µs	-		20 µs	-		-		-			
	-	■	■	-		■	-		■		-	-		-			
	-	■	■	-		■	-		■		-	-		-			
	-	■	-	-		-	-		■		-						
	63		63		31	63		31	63			15		15		31	
	256	1024	256			256			1024			39		39		64	
	■		■			■			■			■		■ (4)	■	■	
	■		■			■			■			-	■	-			
	■		■			■			■			-	■	-	■	■	
	■		- (6)			- (6)			-			-		-			
	■		■			■			■			■		-		■	
	■		■			■			■			-		-			
	■ (7)		■ (7)			■ (7)			■ (7)			-		-			
	■		■			■			■			■		-		■	
	■		■			■			■			-		-			
	Up to 10 MB		10 MB	4 MB	2 MB	10 MB	4 MB	2 MB	Up to 10 MB			-		-			
	■		■			■			■			■		■			
	-		-			-			-			■		■			
	20		11			11			3			-		-			
	1		2			2			1			-		-			
	12		14			14			13			2		-		6	6
	347 V L-N 600 V L-L		277 V L-N (9S, 36S) 480 V L-L (35S)			277 V L-N (9S, 36S) 480 V L-L (35S)			288 V L-N 500 V L-L			-	400 V L-N 690 V L-L	-	690 V	690 V	690 V
	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			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			-					
	110 to 300 V		80 to 160 V / 200 to 350 V			80 to 160 V / 200 to 350 V			110 to 270 V (+/- 10%)			-					
	-		-			-			-			24 V					
	■		■			■			Option			-		Option			
	■		■			■			■			-		-			
	■		■			■			Option			-		-			
	M		M			M			M			M (8)		M			
	Option		Option			Option			Option			-		-			
	Option		Option						Option			-		-			
	Option		Option						Option			-		-			

Separate catalogue

(7) Sequence of Events Recording is a manual process in ION meters. It is not the meters interacting with Software X as with the CMs.
(8) Through IFM module.

PowerLogic BCPM
Functions and characteristics

PE86166



PowerLogic™ BCPM with solid core CT strips

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).

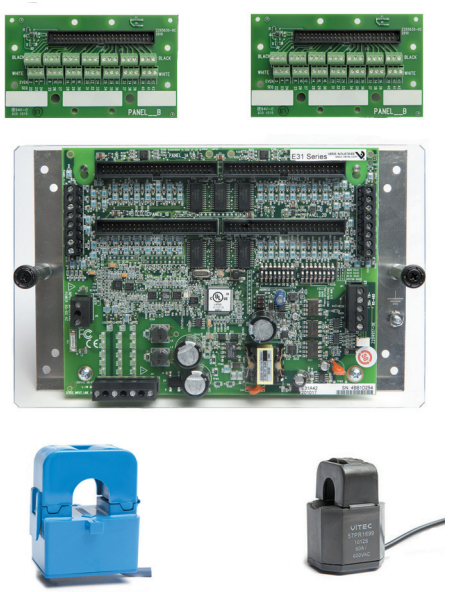
The BCPM monitors up to 84 branch circuits with a single device and also monitors the incoming power mains to provide information on a complete PDU. Full alarming capabilities ensure that potential issues are dealt with before they become problems.

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

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.

PE86281-78



PowerLogic™ BCPM with split core CTs

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 42 or 84 branch circuits using 2 or 4 CT strips. Solid core CTs are rated to 100 A CTs and are mounted on strips – 21 CTs per strip – to simplify installation.

Retrofit projects: BCPM 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. Two sizes of CT are supported (50 A and 100 A) and both CT sizes can be used on a single BCPM.

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.

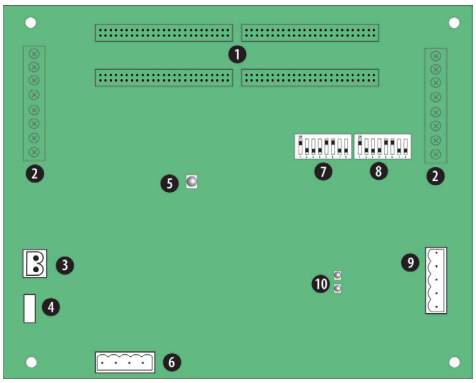
Designed to fit any PDU or RPP design
Lowers your total installation costs as well as the cost per meter point by supporting both new and retrofit installations.

Modbus RTU protocol
Integrates easily into existing networks using Modbus communications.

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

PowerLogic BCPM
Functions and characteristics (cont.)

PE86167

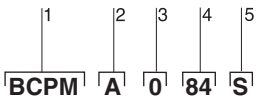


PowerLogic BCPM
1 *50-pin ribbon cable connectors (data acquisition board).*
2 *Auxiliary inputs.*
3 *Control (mains) power connection.*
4 *Control power fuse.*
5 *Alive LED.*
6 *Voltage taps.*
7 *Communications address DIP switches.*
8 *Communications settings DIP switch.*
9 *RS-485 2 connection.*
10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

Selection guide		BCPMA	BCPMB	BCPMC
General				
Use on LV systems		■	■	■
Current accuracy (0.25 A to 2 A)		2% reading	2% reading	2% reading
Current accuracy (2 A to 100 A)		1% reading	1% reading	1% reading
Voltage accuracy		1% reading	1% reading	-
Mains power accuracy*		IEC 61036 Class 1, ANSI C12.1	IEC 61036 Class 1, ANSI C12.1	-
Branch circuit power accuracy (2 A to 100 A)**		3% reading	-	-
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		■	■	■

** Excludes CTs ** Add 1% for 0.8PF to 0.5PF*

PE86168



Example BCPM with solid core CTs part number.

1 *Model.*
2 *Feature set.*
3 *CT spacing.*
4 *Number of circuits.*
5 *Brand.*

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 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
3	CT spacing	0	19 mm CT spacing
		1	26 mm CT spacing
4	Number of circuits	84	84 circuits
		42	42 circuits
5	Brand	S	Schneider Electric

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

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	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.)

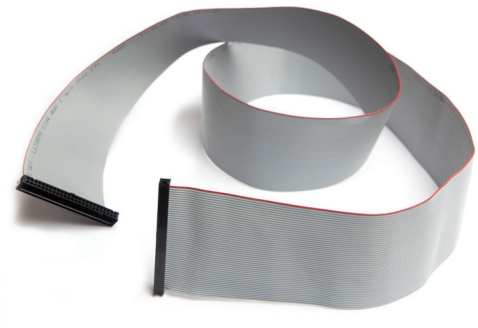
PowerLogic BCPM specifications		
Electrical characteristics		
Type of measurement		
Measurement accuracy (Current and voltage)	Mains current	2% of reading from 1 – 10% of rated current; 1% from 10 – 100% of rated current
	Mains voltage	1% of reading from 90 – 277 V (1)
	Branch current	3% of reading from 0.25 A – 2 A 2% of reading from 2 A – 100 A
	Branch power	3% of reading from 2 A – 100 A (2) (3)
Data update rate		1.8 seconds
Input-voltage characteristics	Measured voltage	150 – 480 V ac L-L (1) 90 – 277 V ac L-N (1)
	Measurement range	150 – 480 V ac L-L (1) 90 – 277 V ac L-N (1)
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 4800, 9600, 19200, 38400 DIP-switch selectable 2-wire or 4-wire RS-485
Protocol		Modbus RTU
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) Power accuracy range: +/- 0.8 power factor to 1.0 power factor.(3) Feature set 'A' only.

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



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 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

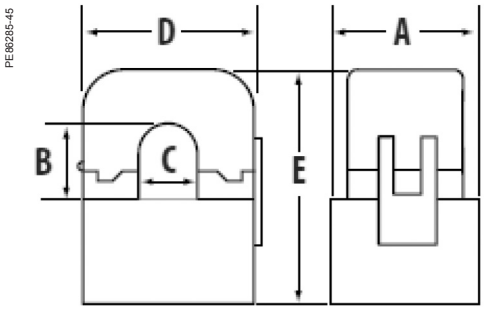
Flat ribbon cable is more flexible than round ribbon cable and is the preferred choice if the ribbon cable will not be threaded through conduit.

PE86183

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
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
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
BCPM with split core	
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
BCPMSCA84S	BCPM feature set A, 84 circuit split core CT power and energy meter, CTs rated to 50 A
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
BCPMSCB84S	BCPM feature set B, 84 circuit split core CT branch current, mains power meter, 50 A CTs
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
BCPMSCC84S	BCPM feature set C, 84 circuit split core CT current meter, CTs rated to 50 A
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
BCPMSCCT1	BCPM 100 A split core CTs, Quantity 6, 1.8 m lead lengths
BCPMSCCT2	BCPM 100 A split core CTs, Quantity 6, 1.2 m lead lengths
Additional accessories for use with BCPM products	
BCPMCOVERS	BCPM circuit board cover
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

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

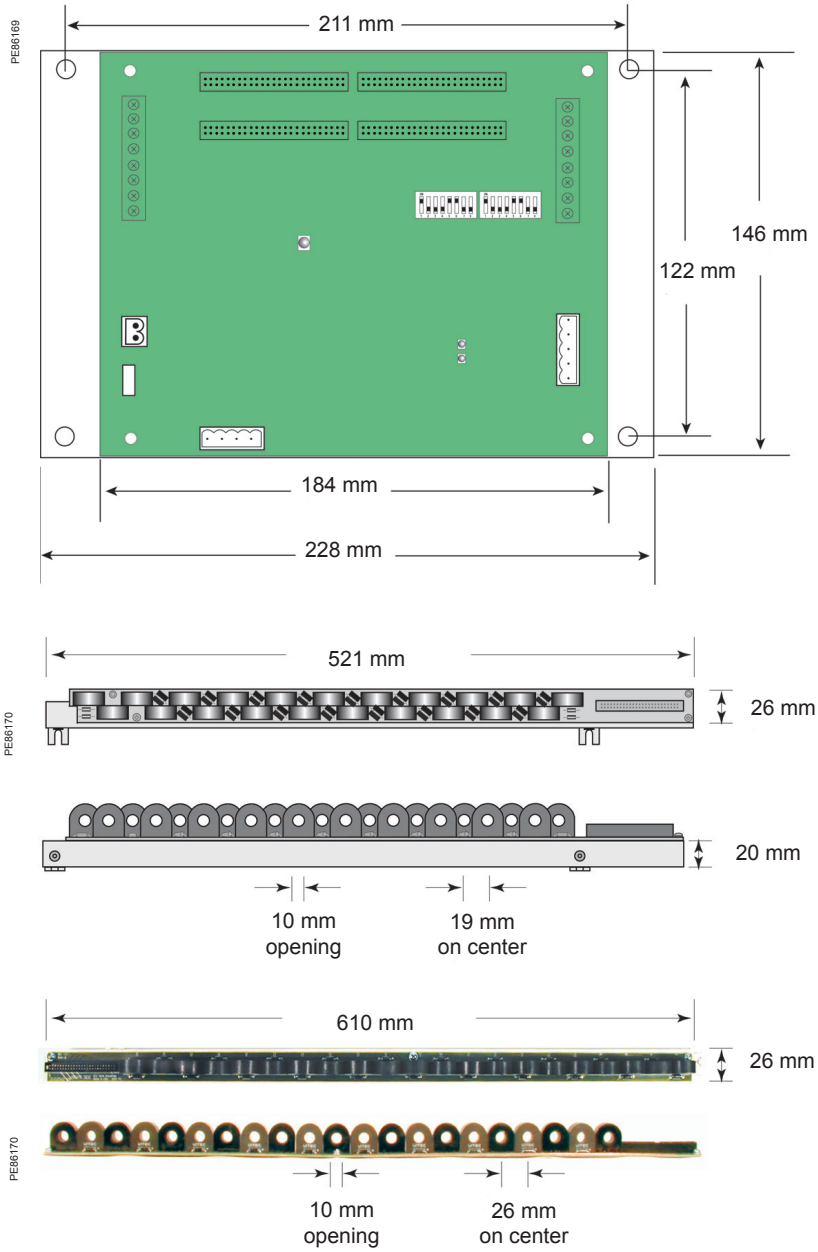
PowerLogic BCPM
Installation and connection



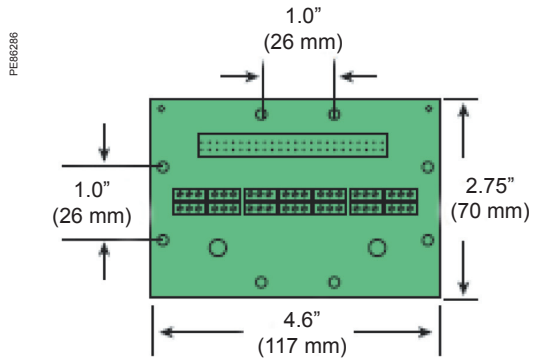
Split core current sensors

50 Amp	100 Amp
A = 1.0” (26 mm)	A = 1.6” (40 mm)
B = 0.5” (11 mm)	B = 0.7” (16 mm)
C = 0.4” (10 mm)	C = 0.7” (16 mm)
D = 0.9” (23 mm)	D = 1.6” (940 mm)
E = 1.6” (40 mm)	E = 2.0” (52 mm)

PowerLogic BCPM dimensions

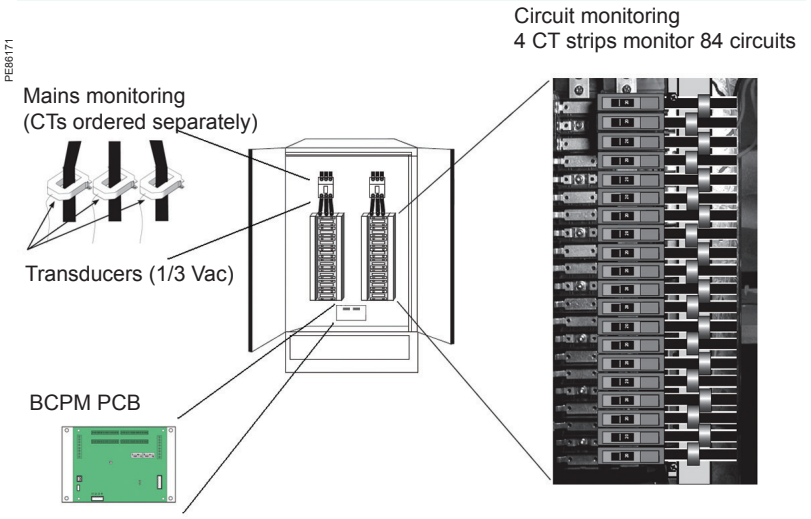


PowerLogic BCPM adapter board (one board per 21 split core branch CTs)

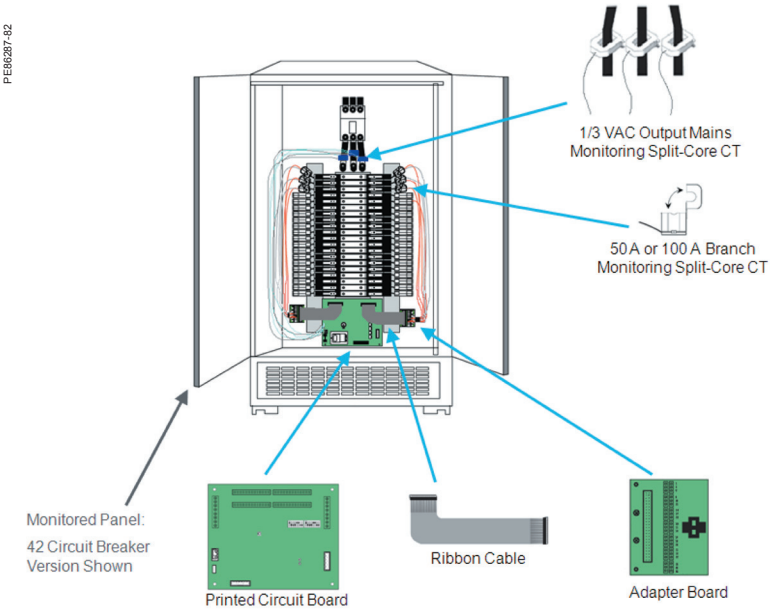


PowerLogic BCPM
Installation and connection (cont.)

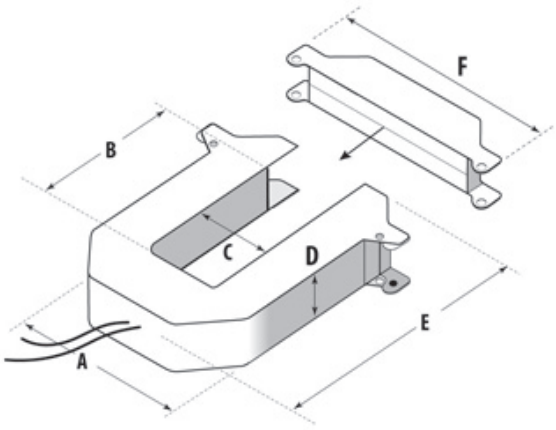
PowerLogic BCPM with solid core CT strips installation details



PowerLogic BCPM with split core CTs installation details



1/3 V low-voltage CT form factor

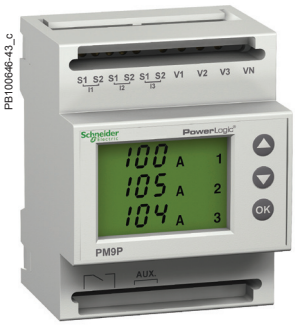


Small form factor
100/200/300 Amp
A = 96 mm
B = 30 mm
C = 31 mm
D = 30 mm
E = 100 mm
F = 121 mm

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

Power Meter Series PM9
Functions and characteristics



Power Meter Series PM9.

The PowerLogic Power Meter Series PM9 offers the basic measurement capabilities required to monitor an electrical installation in a 4-module case (18 mm modules).

They can be used to monitor 2-, 3- and 4-wire low-voltage systems and connect to external current transformers. With the large backlit display, you can monitor all three phases at the same time.

Three versions are available for one supply voltage (220 to 240 V AC):
- PM9 for basic measurements
- PM9P for basic measurements with pulse output
- PM9C for basic measurements with Modbus RS485 output.

Applications
Panel instrumentation.
Sub-billing / cost allocation.
Remote monitoring of an electrical installation.

Characteristics
Only 72 mm wide (four 18 mm modules)
Compact design for optimised installation.

Large backlit display
Simultaneous monitoring of all three phases.

Demand power
Monitoring of subscribed-power overruns.

Compliance with standards
Complies with IEC 61557-12 standard for Power Meter.
IEC 62053-21 class 1 accuracy for active energy for sub-billing and cost-allocation applications.

Part numbers

Type	Voltage	Width in 9 mm modules	Part no.
Power Meter PM9	220 to 240 V AC	8	**15199**
Power Meter PM9P	220 to 240 V AC	8	**15197**
Power Meter PM9C	220 to 240 V AC	8	**15198**

Power Meter Series PM9
Functions and characteristics (cont.)

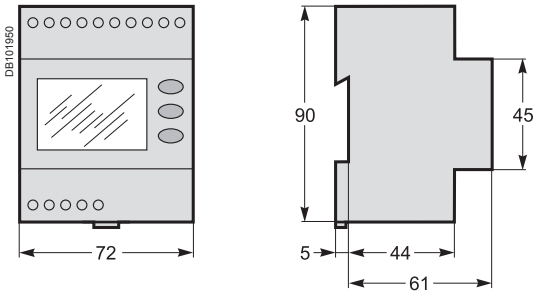
Selection guide		PM9	PM9P	PM9C
General				
Use on LV systems only	1P + N, 3P, 3P + N	■	■	■
Current and voltage accuracy		0.5 %	0.5 %	0.5 %
Energy and power accuracy		1 %	1 %	1 %
Direct voltage connection		450 V	450 V	450 V
Instantaneous rms values				
Current	3 phases and neutral	■	■	■
Voltage	Phase-to-neutral and phase-to-phase	■	■	■
Frequency		■	■	■
Active and reactive power	Total and per phase	■	■	■
Apparent power	Total	■	■	■
Power factor	Total	■	■	■
Energy values				
Active energy		■	■	■
Partial active energy		■	■	■
Reactive energy		■	■	■
Demand values				
Active, reactive, apparent power	Present and max. values	■	■	■
Other measurements				
Hour counter		■	■	■
Display and I/O				
Backlit LCD display		■	■	■
Pulse output		-	1	-
Communication				
RS485 port		-	-	■
Modbus protocol		-	-	■

Power Meter Series PM9
Functions and characteristics (cont.)

Electrical characteristics		
Type of measurement		On single-phase (1P + N) or three-phase (3P, 3P + N) AC systems
Measurement accuracy	Current and voltage	0.5 % of reading
	Power	1 % of reading from pf 0.8 leading to 0.5 lagging
	Frequency	0.2 Hz
	Power factor	2 % from 0.8 leading to 0.5 lagging
	Active energy	Class 1 as defined by IEC 62053-21 and IEC 61557-12
	Reactive energy	Class 2 as defined by IEC 62053-23 and IEC 61557-12
Input-voltage characteristics	Measured voltage	50 to 450 V AC (direct) and up to 1000 V AC (with external VT)
	Permissible overload	1.15 Un
	Frequency measurement range	45 to 65 Hz
Input-current characteristics	CT ratings	Adjustable from 5 to 10000 A
	Secondary	5 A
	Metering over-range	15 mA to 6 A
	Permissible overload	6 A continuous 20 A 10 s 50 A 1 s
	Load	0.55 VA
	Input current	Not isolated
Control Power	AC	220 to 240 V AC (±10 %), < 5 VA
Pulse output (PM9P)		Static output, 350 V AC/DC max., 130 mA max. at 25 °C, derating 1 mA/°C above 25 °C, 5 kV insulation
Mechanical characteristics		
Weight		0.3 kg
IP degree of protection		IP52 (front display)
Dimensions		72 x 90 x 66 (mm)
Connection		Tunnel terminals, 1 x 4 mm^2
Environmental conditions		
Operating temperature		-5 °C to +55 °C
Pollution degree		2
Installation category		III for distribution systems up to 260/450 V
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 IV (IEC 61000-4-4)
	Immunity to impulse waves	Level IV (IEC 61000-4-5)
	Conducted and radiated emissions	Class B (CISPR11)
Safety		
		CE
Communication		
RS485 port (PM9C) remote reading and reset		2-wire, 9600 or 19200 bauds, Modbus RTU, ELSV circuit, 6 kV impulse withstand (double insulation)
Standards compliance		
IEC 61557-12		PMD/SD/K55/1 PMD/SS/K55/1

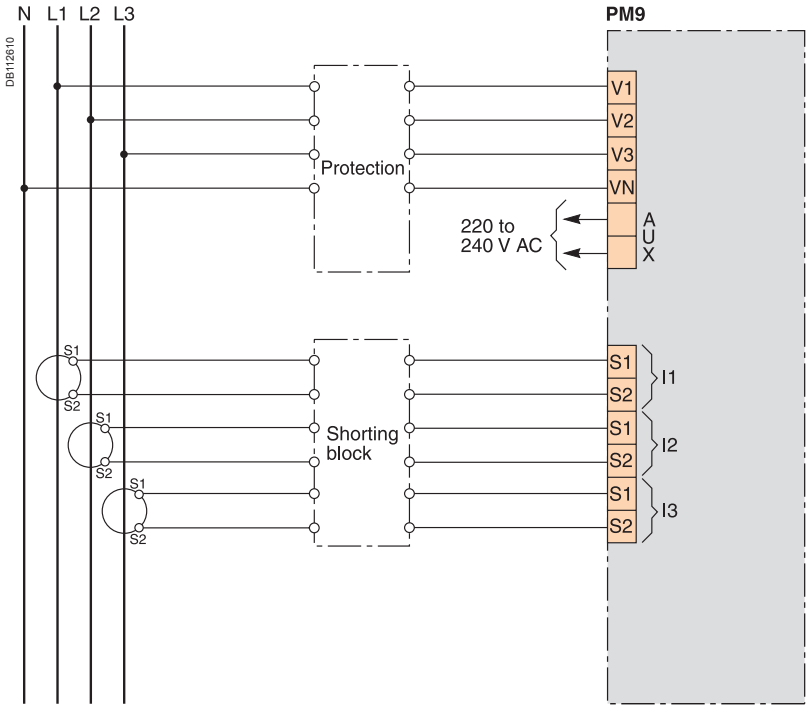
Power Meter Series PM9
Installation and connection

Dimensions



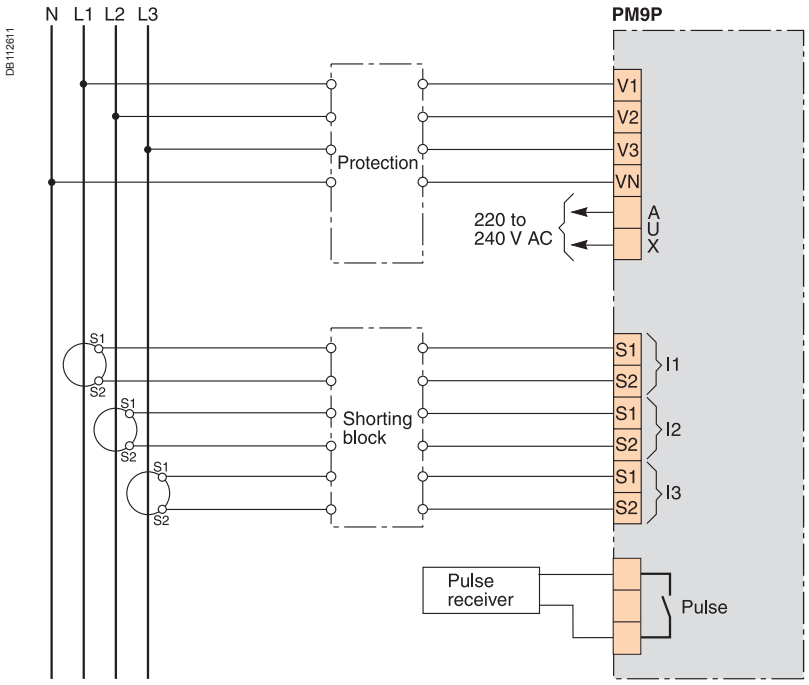
Power Meter Series PM9
Installation and connection (cont.)

PM9/4-wire connection with 3 CTs



Connection example.

PM9P/4-wire connection with 3 CTs

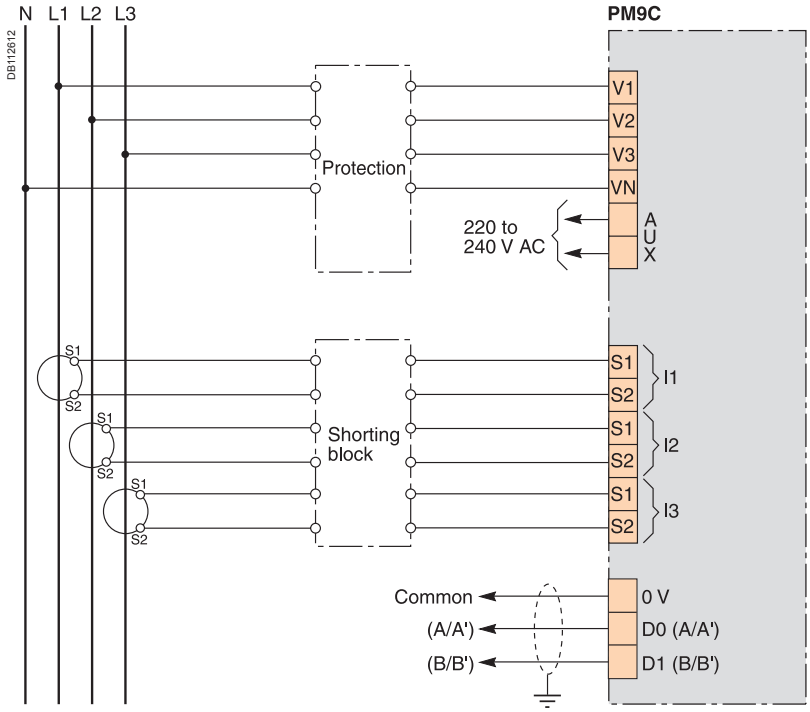


Connection example.

***Note:** other types of connection are possible. See product documentation.*

Power Meter Series PM9
Installation and connection (cont.)

PM9C/4-wire connection with 3 CTs



Connection example.

***Note:** other types of connection are possible. See product documentation.*

PM1000 series
Functions and characteristics

PE86260-54

PowerLogic™ PM1000 power meter.

The PowerLogic PM1000 series power meters are easy-to-use, cost effective meters that offer the basic measurement capabilities required to monitor an electrical installation.

Characterized by their rugged construction, compact size, and low installation costs, these state-of-the-art multi-function meters are ideal for control panels, motor control centers and genset panels.

The PowerLogic PM1000 series power meter is available in two different versions to better fit specific applications:
PM1000, basic version
PM1200, basic version plus an RS485 port for Modbus communication.

Applications
Power monitoring operations.
Load studies and circuit optimisation.
Equipment monitoring and control.
Preventative maintenance.

PE86261-54

Main characteristics

Accurate metering
The meter conforms to accuracy class 1.0 as per IEC 62052-11 and IEC 62053-21.

Easy to read display
The bright, alphanumeric, 15mm high LED display provides 3 lines for measurement values with 4 digits per line. The display auto-scales for Kilo, Mega and Giga values. Auto scrolling mode allows for easy reading.

Analogue load bar
The colour-coded analogue load bar indicates the percentage of load through 12 LED segments.

Turbo Key access to information
The Turbo Key button lets you access to the most commonly viewed parameters or enter set up mode with a single push of the button.

Quick and easy installation
Setup is done through the front panel keys. Quick entry to setup during power up by TURBO key. Direct connection for metering voltage inputs up to 480 Vac L-L.

Colour-coded terminal board labeling
The colour-coded label on the terminal board helps ensure accurate wiring.

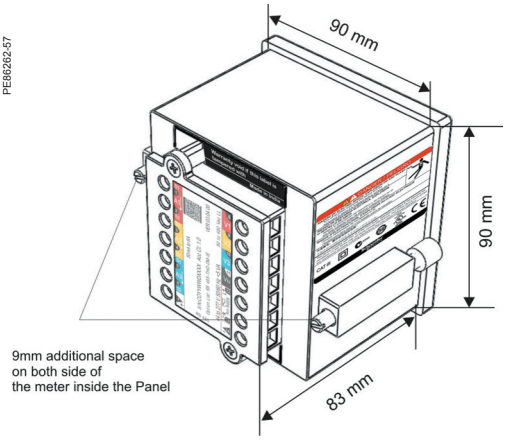
Secure settings
Safeguard access to setup parameters with unique password protection. A keypad lock lets you display a user selected page by default.

Part numbers

Description	Schneider Electric
PM1000 power meter with basic readings, energy and demand parameters, and summary screens; no communications	**METSEPM1000**
Same as PM1000 plus an RS485 communication port	**METSEPM1200**

PM1000 series
Functions and characteristics (cont.)

PE86262-57



PowerLogic PM1000 series power meter dimensions.

Selection guide		PM1000	PM1200
General			
Use on LV and HV systems		■	■
Current and voltage accuracy		1.0 %	1.0 %
Power accuracy		1.0 %	1.0 %
Energy accuracy		1.0 %	1.0 %
Number of samples per cycle		20 at 50 Hz	20 at 50 Hz
Instantaneous rms values			
Current	Per phase & Neutral	■	■
Voltage	Average, Phase to Neutral & Phase to Phase	■	■
Frequency		■	■
Active, apparent power	Total & per phase	■	■
Power factor	Average & per phase	■	■
Unbalance	Current, voltage	■	■
Phase angle	Between V & I, Ph1, Ph2, Ph3	■	■
RPM	For generator only, speed calculated on generator voltage output and number of machine poles.	■	■
Energy values			
Active, reactive, apparent energy		■	■
Demand values			
Current	Present & max.	■	■
Active apparent power	Present & max.	■	■
Active apparent power settable by user*		■	■
* Client can select one parameter only: A, KW, or KVA			
Power quality measurements			
Total harmonic distortion	Current, voltage, per phase	■	■
Other measurements			
Run hours	Operating time for load in hours	■	■
ON hours	Operating time for meter in hours	■	■
INTR	Number of interruptions	■	■
Display			
LED display		■	■
Communication			
RS-485 port		-	1
Modbus protocol		-	■

PM1000 series
Functions and characteristics (cont.)

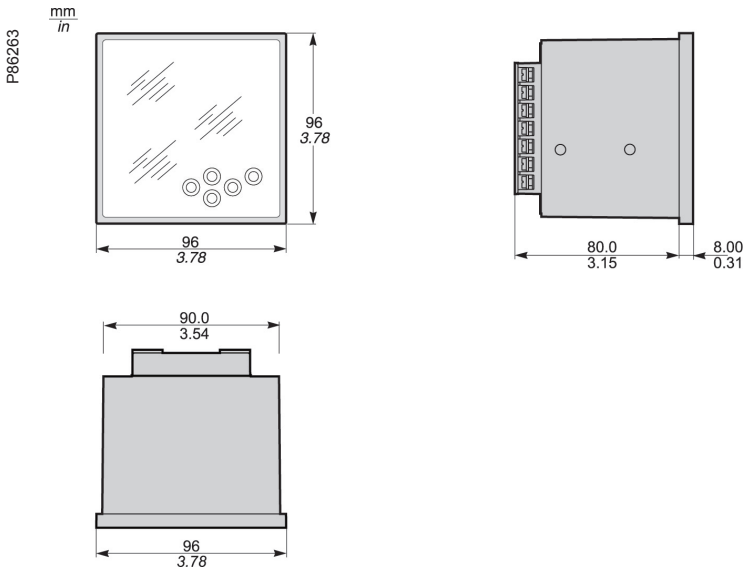
Electrical characteristics			
Type of measurement			True RMS up to the 9th harmonic 20 samples per cycle at 50 Hz
Measurement accuracy*	Current and voltage		1.0 % of reading
	Power	Active	1.0 % of reading
		Reactive	2.0 % of reading
		Apparent	1.0 % of reading
	Frequency		0.1 % of reading
	Power factor		1.0 % of reading
	Energy	Active	IEC 62053-21 Class 1
		Reactive	IEC 62053-23 Class 2
		Apparent	1.0 % of reading
* Additional error of 0.05% of full scale, for meter input current below 100 mA			
Data update rate			1 sec
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
	Permissable overload		1.10 Un (480 V L-L)
	Burden		0.2 VA per phase max.
	Impedance		VLL - 4 Mohms, VLN – 2 Mohms
	Frequency range		45 - 65 Hz
Input-current characteristics	CT ratings	Primary	1 A - 99.0 kA
		Secondary	1 A - 5 A
	Measurement range		50 mA - 6 A (5 mA is the starting)`
	Permissible overload		10 A continuous
	Burden		0.2 VA per phase max.
	Impedance		< 0.1 ohm
Power supply	AC		44 - 277 V AC at 50 Hz/60 Hz
	DC		44 - 277 V DC
	Ride-through time		100 ms at 50V
	Burden		3 VA max.
Mechanical characteristics			
Weight			0.500 kg (shipping), 0.400 kg (unpacked)
IP degree of protection			Front: IP 51; Back: IP 40
Dimensions			Bezel: 96 x 96 mm Depth: 80 mm behind bezel Panel cutout: 92 x 92 mm
Environmental conditions			
Operating temperature			-10°C to +60°C
Storage temperature			-25°C to +70°C
Humidity rating			5 to 95 % RH non-condensing
Altitude			2000 m
Measurement CAT			III
Pollution degree			2
Protection class			2
Electromagnetic compatibility			
Electrostatic discharge			IEC 61000-4-2
Immunity to electromagnetic RF fields			IEC 61000-4-3
Immunity to electrical fast transients			IEC 61000-4-4
Immunity to surge waves			IEC 61000-4-5
Conducted disturbance immunity			IEC 61000-4-6
Damped oscillatory waves immunity			IEC 61000-4-12
Impulse voltage withstand			6kV for 1.2/50 µS per IEC 60060-1
Conducted and radiated emissions			CISPR11 Class A, FCC Part 15 Class A
Safety and standards			
Safety construction			Self extinguishable V0 plastic; UL 508
CE certification IEC61010			Yes
Complies with Regulation (EC) n° 1907/2006 of Dec 18 2006 named REACH (related to the Registration, Evaluation, Authorization and restrictions applicable to Chemical substances)			

PM1000 series
Functions and characteristics (cont.)

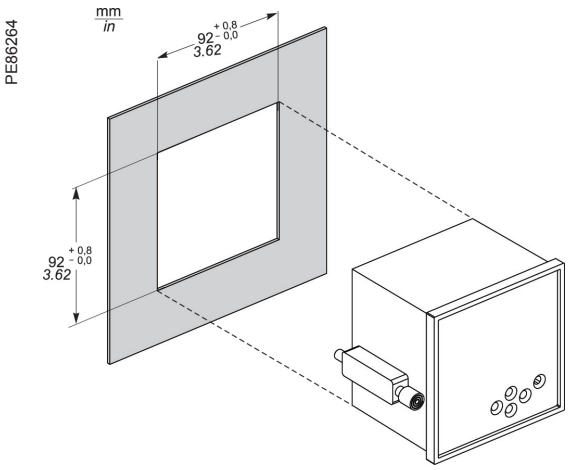
Communication	
RS-485 port	2 terminals only Baud rate up to 19,200 bps Protocols: Modbus RTU
Display characteristics	
Integrated LED display	View 3 parameters together on 3 line, 4 digits per line display. Auto-scaling capability for Kilo, Mega, and Giga values. User-selectable default display page. Password protection for setup parameters.
Analogue load bar	Colour-coded analogue indicator provides an option to select the full scale of the load bar based on the sanctioned power limit

PM1000 series
Installation and connections

PM1000 series meter dimensions

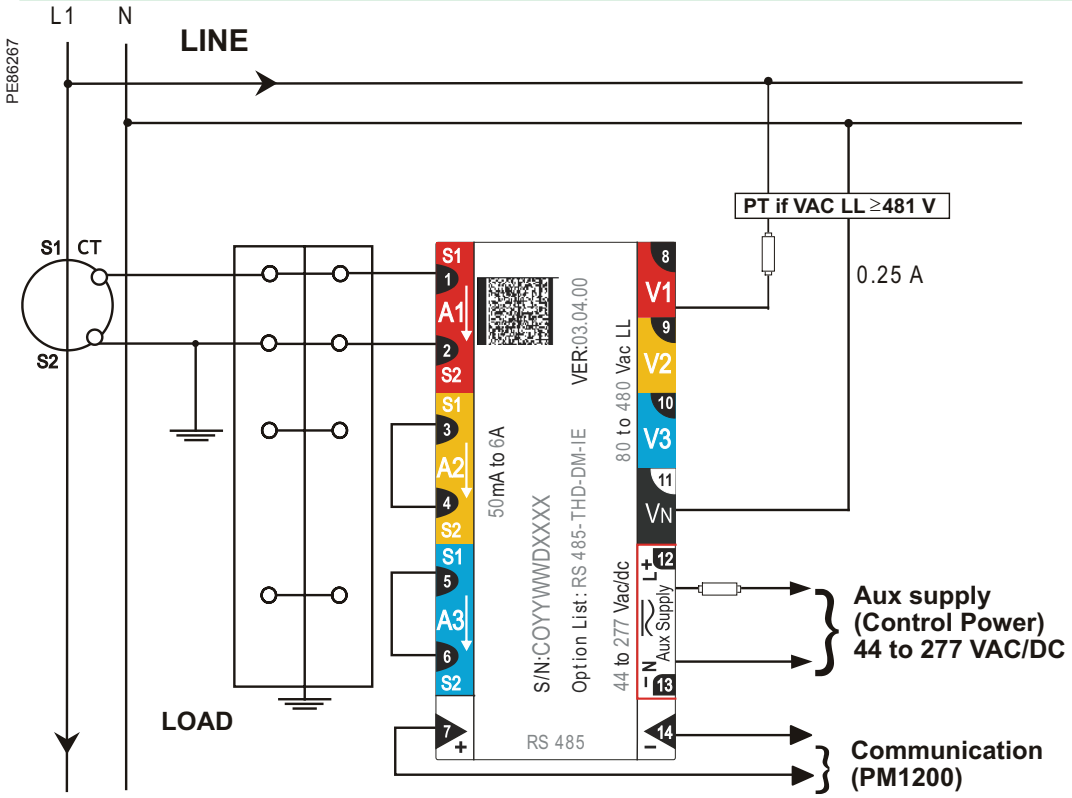


Front-panel mounting



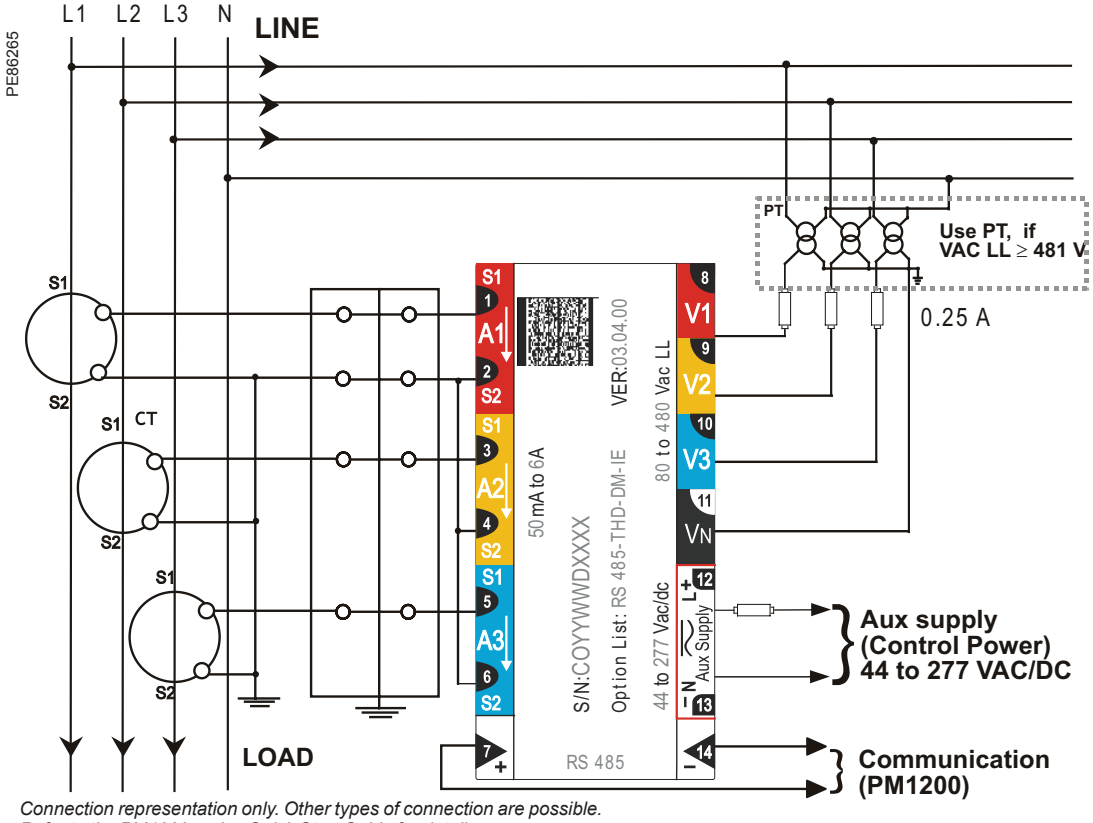
PM1000 series
Installation and connections (cont.)

Single phase connection



Connection representation only. Other types of connection are possible.
Refer to the PM1000 series Quick Start Guide for details.

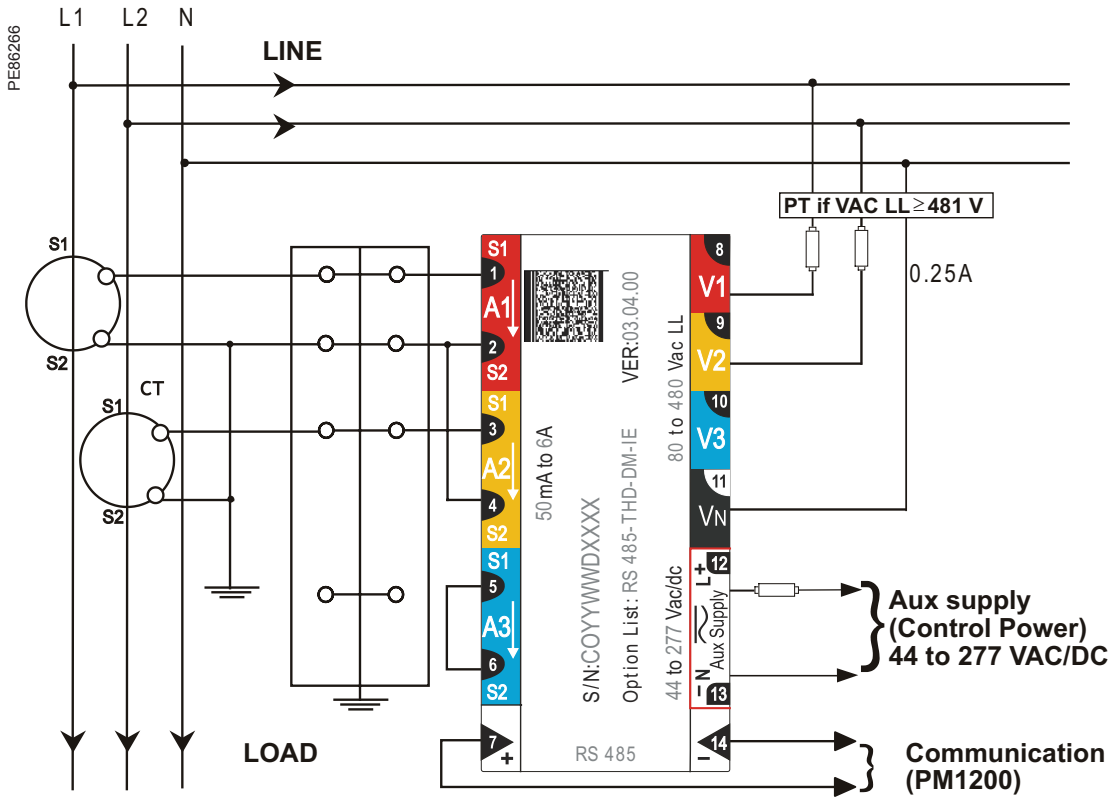
Three phase 4 wire WYE connection with 3 CTs and 3 PTs



Connection representation only. Other types of connection are possible.
Refer to the PM1000 series Quick Start Guide for details.

PM1000 series
Installation and connections (cont.)

Two phase 3 wire connection with 3 CTs



Connection representation only. Other types of connection are possible.
Refer to the PM1000 series Quick Start Guide for details.

PM200 series
Functions and characteristics

PE86217

The PowerLogic PM200 series power meter is an easy-to-use, cost effective meter that offers the basic measurement capabilities required to monitor an electrical installation. The compact 96 x 96 mm meter simultaneously monitors all three phases of voltage and current. Energy and demand readings provide the information needed to measure and control energy costs.

The meter includes an easy-to-read, anti-glare, back-lit LCD display. It features an intuitive interface with context-based navigational menus. Summary screens and bar charts provide system status at a glance. The default screen displays real energy and per-phase current values. The energy summary screen displays total real, reactive, and apparent energy. The power demand summary screen displays real, reactive, and apparent demand. The current demand summary screen provides the per-phase and peak values needed to understand circuit performance and loading.

The PowerLogic PM200 series power meter is available in three different versions to better fit specific applications:
- PM200, basic version
- PM200P, basic version plus two pulse outputs for energy metering
- PM210, basic version plus an RS485 port for Modbus communication.

Applications
OEM applications.
Panel instrumentation.
Applications with space restrictions.
Remote monitoring of an electrical installation.
Sub-billing / cost allocation / utility billing verification.
Cost constrained applications.

Characteristics
Compact
With a mounting depth of only 50 mm, the PM200 series is the perfect space saver.

Large, easy-to-read display
Summary screens for current, voltage, energy and demand on an anti-glare, green back-light display.

Bar charts
Graphical representation of system loading and Outputs status (PM200P) provide system status at a glance.

Easy to operate
Intuitive navigation with context-based menus for easy use.

Modbus communications and digital outputs
The PM210 provides standard Modbus communications. The PM200P provides two integrated digital outputs.

IEC 62053-21 Class 1 for real energy
Accurate measurement for sub-billing and cost allocation.

IEC 61557-12 performance standard
Meets IEC 61557-12 PMD/S/K55/1 requirements for combined **P**erformance **M**easuring and monitoring **D**evices (PMD).

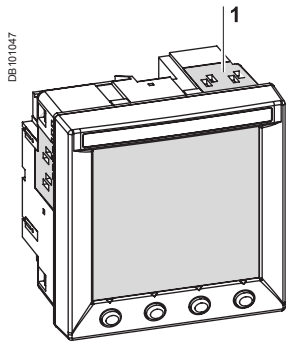
Direct connection for metering voltage inputs
No external PTs needed for voltages up to 480 V AC (L-L).

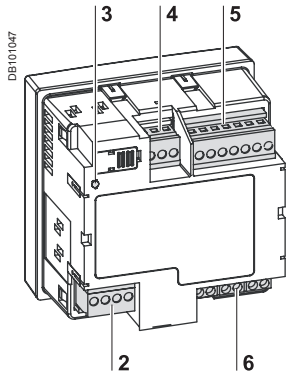
Easy to install
Uses only two clips. No tools needed.

Part numbers

Description	Schneider Electric	Square D
Meter with Integrated Display		
Meter PM200 power meter with basic readings, demand, and summary screens	**PM200MG**	**PM200**
Same as PM200 plus two digital outputs	**PM200PMG**	**PM200P**
Same as PM200 plus an RS485 communication port	**PM210MG**	**PM210**
Parts and accessories		
DIN-rail Mounting Kit	**PM72DINRAILKIT**	
Set of connectors	**PM7AND2HWKIT**	

PM200 series
Functions and characteristics (cont.)





PM200 series power meter.
1 *Mounting slots.*
2 *RS485 communications (PM210) or 2 pulse outputs (PM200P).*
3 *Heartbeat LED.*
4 *Power supply.*
5 *Voltage inputs.*
6 *Current inputs.*

Meter selection guide		PM200	PM200P	PM210
Performance standard				
IEC 61557-12 PMD/S/K55/1 **P**erformance **M**easuring and monitoring **D**evices (PMD)		■	■	■
General				
Use from LV to HV power systems		■	■	■
Current and voltage accuracy		0.5 %	0.5 %	0.5 %
Active and reactive power accuracy		1 %	1 %	1 %
Active energy accuracy		1 %	1 %	1 %
Reactive energy accuracy		2 %	2 %	2 %
Sampling rate (samples/cycle)		32	32	32
Instantaneous rms values				
Current	Per-phase	■	■	■
Voltage	Ph-Ph and Ph-N	■	■	■
Frequency		■	■	■
Active and reactive power; and apparent power (1)	Total	signed	signed	signed
Power factor	Total	signed	signed	signed (2)
Energy values				
Active, reactive, apparent energy (1)	Total	signed	signed	signed
Demand values				
Current (thermal calculation mode only)	Present and max. values	■	■	■
Active, reactive, apparent power	Present and max. values	■	■	■
Setting of power demand calculation mode	Sliding, fixed, rolling block	■	■	■
Outputs				
Digital pulse outputs		-	2(3)	-
Display				
Green backlit LCD display		■	■	■
IEC or IEEE menu mode		■	■	■
Communication				
RS485 (one port)		-	-	2-wire
Modbus protocol		-	-	■
Firmware update via RS485 serial port				■

(1) *Signed real and reactive power and energy. The power meter includes net values only.*
(2) *See register 4048. Negative sign "-" indicates lag. PM210 only.*
(3) kWh and kVARh pulse output mode only.

PM200 series
Functions and characteristics (cont.)

PB100710

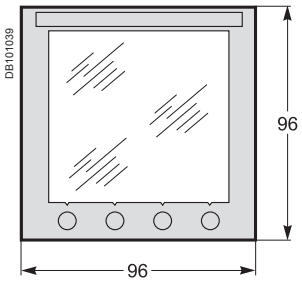
Rear view of PowerLogic PM200 series meter.

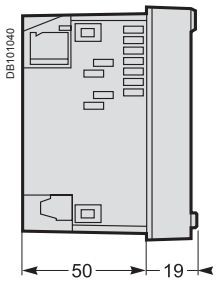
Electrical characteristics			
Type of measurement			True rms up to the 15th harmonic on single, two or three-phase (3P, 3P + N) AC systems 32 samples per cycle
Measurement accuracy	Current		± 0.5% from 1 A to 6 A
	Voltage		± 0.5% from 50 V to 277 V
	Power factor		± 0.0034, from 1A to 6A and from -0.5 to +0.5
	Power		± 1%
	Frequency		± 0.02 Hz from 45 to 65 Hz
	Active energy		IEC 62053-21 Class 1
	Reactive energy		IEC 62053-23 Class 2
Data update rate			1 s
Input-voltage	Measured voltage		10 to 480 V AC (direct Ph-Ph) 10 to 277 V AC (direct Ph-N) up to 1.6 MV AC (with external VT)(1)
	Metering over-range		1.2 Un
	Impedance		2 MΩ (Ph-Ph) / 1 MΩ (Ph-N)
	Frequency range		45 to 65 Hz
Input-current	CT ratings	Primary	Adjustable from 1 A to 32767 A
		Secondary	5 A or 1 A
	Measurement input range		5 mA to 6 A
	Permissible overload		15 A continuous 50 A for 10 seconds per hour 120 A for 1 second per hour
	Impedance		< 0.12 Ω
	Load		< 0.15 VA
Control power	AC		100 to 415 ± 10 % V AC, 5 VA; 50 to 60 Hz
	DC		125 to 250 ± 20 % V DC, 3 W
	Ride-through time		100 ms at 120 V AC
Output	Pulse outputs	(PM200P)	Static output 240 ± 10 % V AC, 100 mA max. at 25 °C, (derate 0.56 mA per °C above 25°C), 2.41 kV rms isolation, 30 Ω on-resistance at 100 mA
Mechanical characteristics			
Weight			0.37 kg
IP degree of protection (IEC 60529)			Designed to IP52 front display, IP30 meter body
Dimensions			96 x 96 x 69 mm (meter with display) 96 x 96 x 50 mm (mounting depth)
Environmental characteristics			
Operating temperature	Meter		- 5 °C to + 60 °C
	Display		- 10 °C to + 55 °C
Storage temperature	Meter + display		- 40 °C to + 85 °C
Humidity rating			5 to 95 % RH at 50 °C (non-condensing)
Pollution degree			2
Metering category (voltage inputs and control power)			CAT III, for distribution systems up to 277 V Ph-N / 480 V AC Ph-Ph
Dielectric withstand			EN 61010, UL508 Double insulated front panel display
Altitude			3000 m
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 impulsive 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 commercial environment/FCC part 15 class B EN 55011
Harmonics			IEC 61000-3-2
Flicker emissions			IEC 61000-3-3
Safety			
Europe			CE as per IEC 61010-1
U.S. and Canada			cULus (UL508 and CAN/CSA C22.2 No. 14-M95, Industrial Control Equipment)
Communication			
RS485 port (PM210)			2-wire, up to 19200 bauds, Modbus RTU, SELV circuit, 6 kV impulse (double insulation)
Display characteristics			
Dimensions 73 x 69 mm			Green back-lit LCD (6 lines total, 4 concurrent values)

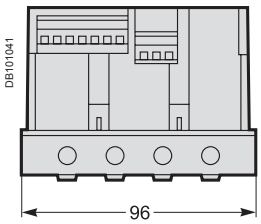
(1) Lower limit of measurement range depends upon PT ratio.

Power Meter Series 200
Installation and connection

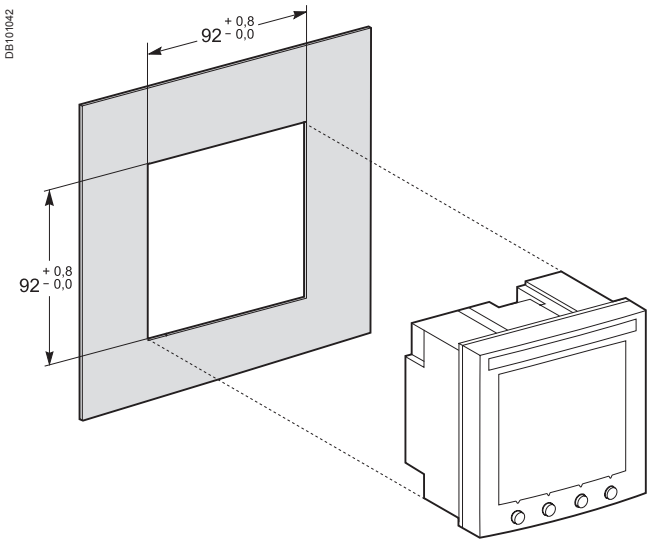
Dimensions





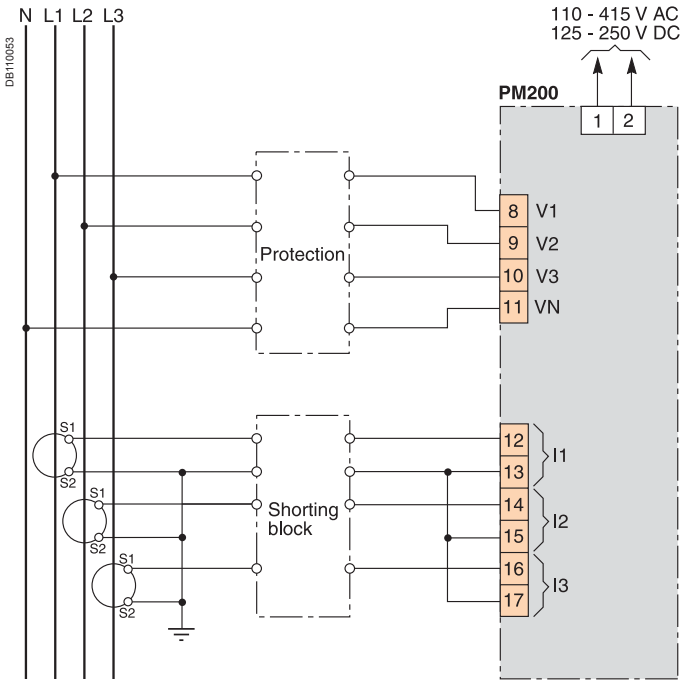


Front-panel mounting



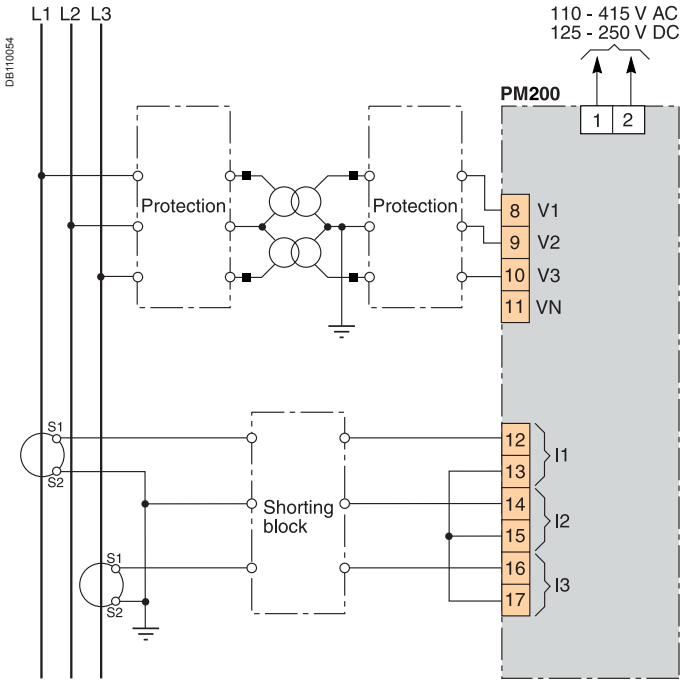
Power Meter Series 200
Installation and connection (cont.)

4-wire connection with 3 CTs and no PT



Connection example.

3-wire connection with 2 CTs and 2 PTs

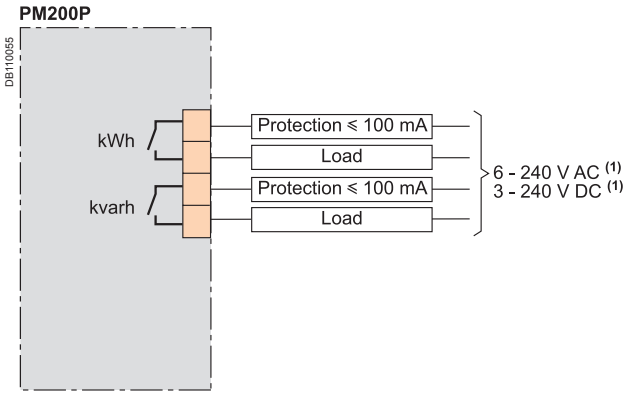


Connection example.

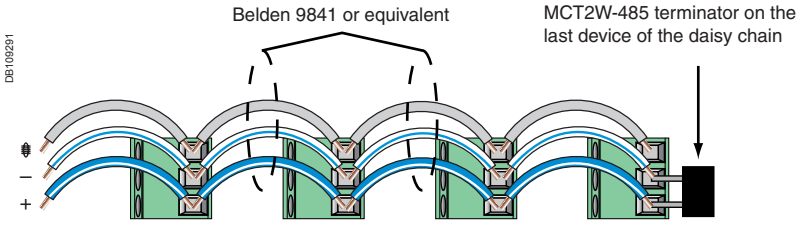
Note: Other types of connection are possible. See product documentation.

Power Meter Series 200
Installation and connection (cont.)

PM200P : pulse outputs connection



Meter (2-wire)



Power Meter 200 or other POWERLOGIC 2-wire compatible devices

Belden 9841 wire colors: blue with white stripe (+), white with blue stripe (–), and silver (shield)

PM700 series
Functions and characteristics

PE86157

PowerLogic PM700.

The PowerLogic PM700 series meters offer all the measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit extending only 50 mm behind the mounting surface.

With its large display, you can monitor all three phases and neutral at the same time. The anti-glare display features large 11 mm high characters and powerful backlighting for easy reading even in extreme lighting conditions and viewing angles.

The PowerLogic PM700 series meters are available in four versions to better fit specific applications:
- PM700, basic metering with THD and min/max readings
- PM700P, same functions as the PM700, plus two solid-state pulse outputs for energy metering
- PM710, same functions as the PM700, plus one RS 485 port for Modbus communication
- PM750, same functions as the PM710, plus two digital inputs, one digital output and alarms.

Applications
Panel instrumentation.
Sub-billing and cost allocation.
Remote monitoring of an electrical installation.
Harmonic monitoring (THD).
Alarming with under/over conditions and I/O status (PM750).

Characteristics
Requires only 50 mm behind mounting surface
The PM700 series meters can be mounted on switchboard doors to maximise free space for electrical devices.

Large back lit display with integrated bar charts
Displays 4 measurements at a time for fast readings. Uses only two clips for installation; no tools necessary.

Intuitive use
Easy navigation using context-sensitive menus.

Bar charts
Graphical representation of system loading and Status of Inputs/Outputs (PM750 and PM700P) provide system status at a glance.

Power and current demand, THD and min/max reading in basic version
A high-performance solution for trouble-free monitoring of your electrical installation.

Active energy class IEC 62053-22 class 0.5S (PM750) and IEC 62053-21 class 1 (PM700, PM700P, PM710)
Suitable for sub-billing and cost-allocation applications.

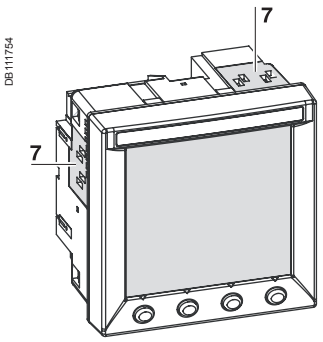
IEC 61557-12 Performance Standard
Meet IEC 61557-12 PMD/S/K55/0.5 (PM750) and IEC61557-12 PMD/S/K55/1 (PM700, PM700P, PM710) requirements for combined **P**erformance **M**easuring and monitoring **D**evices (PMD).

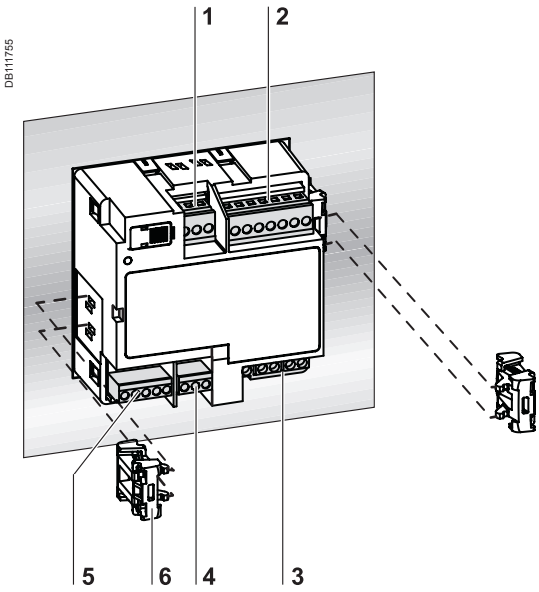
Innovative Power Meter
RS 485 communications, alarming and digital I/O in a single Power Meter (PM750).

Part numbers

Power Meter	Schneider Electric	Square D
PM700 power meter - with basic readings including THD and Min/Max	**PM700MG**	**PM700**
PM700P power meter - same as PM700 plus two pulse outputs	**PM700PMG**	**PM700P**
PM710 power meter - same as PM700 plus RS 485 port	**PM710MG**	**PM710**
PM750 power meter - same as PM700 plus RS 485 port, 2 Digital inputs and 1 Digital output, and alarms	**PM750MG**	**PM750**
Parts and accessories		
DIN-rail Mounting Kit	**PM72DINRAILKIT**	
Set of connectors replacement (PM700, PM700P, PM710)	**PM7AND2HWKIT**	
Set of connectors replacement (PM750 only)	**PM750HWKIT**	

PM700 series
Functions and characteristics (cont.)





PM750.
1 Control power.
2 Voltage inputs.
3 Current inputs.
4 RS 485 port.
5 Digital input/output.
6 Mounting clips.
7 Mounting slot.

Selection guide		PM700	PM700P	PM710	PM750
Performance standard					
IEC 61557-12 PMD/S/K55/1 Requirements for combined Performance Measuring and monitoring Devices (PMD)		■	■	■	-
IEC 61557-12 PMD/S/K55/0.5 Requirements for combined Performance Measuring and monitoring Devices (PMD)		-	-	-	■
General					
Use on LV and HV systems		■	■	■	■
Current accuracy		0.5 %	0.5 %	0.5 %	0.4 %
Voltage accuracy		0.5 %	0.5 %	0.5 %	0.3 %
Active and reactive power accuracy		1.0 %	1.0 %	1.0 %	0.5 %
Active energy accuracy IEC 62053-21		Class 1	Class 1	Class 1	
Active energy accuracy IEC 62053-22					Class 0.5S
Reactive energy accuracy		2 %	2 %	2 %	2 %
Sampling rate (samples/cycle)		32	32	32	32
Instantaneous rms values					
Current	Total, Phases and neutral	■	■	■	■
Voltage	Total, Ph-Ph and Ph-N	■	■	■	■
Frequency		■	■	■	■
Real and reactive power (1) and apparent power	Total and per phase	signed	signed	signed	signed
Power factor	Total	signed	signed	signed (2)	signed (2)
Energy values					
Active and reactive energy (1); and apparent energy		signed	signed	signed	signed
Demand values					
Current Thermal calculation mode only	Present and max.	■	■	■	■
Active, reactive, apparent power	Present and max.	■	■	■	■
Setting of power demand calculation mode	Sliding, fixed and rolling block	■	■	■	■
Other measurements					
Hour counter		■	■	■	■
Power quality measurements					
Harmonic distortion	Current and voltage	■	■	■	■
Data recording					
Min/max of instantaneous values		■	■	■	■
Alarms		-	-	-	■ (3)
Inputs/Outputs					
Digital inputs		-	-	-	2 (4)
Digital outputs		-	2 (5)	-	1 (6)
Display					
Green backlit LCD display		■	■	■	■
IEC or IEEE visualization mode		■	■	■	■
Communication					
RS 485 port		-	-	■	■
Modbus protocol		-	-	■	■
Firmware update via RS485 serial port				■	■

(1) *Signed real and reactive power and energy. The power meter includes net values only.*
(2) *See register 4048. Negative sign "-" indicates lag.*
(3) *15 user-configurable under and over conditions and in combination with digital inputs or output status.*
(4) *2 operation modes are available: normal or input demand synchronisation.*
(5) *kWh and kVARh pulse output mode only.*
(6) *3 operation modes are available: external, alarm or kWh pulse output.*

PM700 series
Functions and characteristics (cont.)

PB102030-51

Rear view of PM750.

Electrical characteristics			
Type of measurement			True rms up to the 15th harmonic on three-phase (3P, 3P + N) two-phase and single-phase AC systems 32 samples per cycle
Measurement accuracy	Current		± 0.5% from 1A to 6 A (PM700, PM700P, PM710) ± 0.4% from 1A to 6 A (PM750)
	Voltage		± 0.5% from 50V to 277V (PM700, PM700P, PM710) ± 0.3% from 50V to 277V (PM750)
	Power Factor		± 0.0034, from 1A to 6A and from -0.5 to +0.5
	Power		± 1% (PM700, PM700P, PM710) ± 0.5% (PM750)
	Frequency		± 0.02 Hz from 45 to 65 Hz
	Active Energy		IEC 62053-21 Class 1 (1) IEC 62053-22 Class 05.S (2)
	Reactive Energy		IEC 62053-23 Class 2
Data update rate			1 s
Input-voltage characteristics	Measured voltage		10 to 480 V AC (direct Ph-Ph) 10 to 277 V AC (direct Ph-N) up to 1.6 MV AC (with external VT) the lower limit of the measurement range depends on the PT ratio
	Metering over-range		1.2 Un (20%)
	Impedance		2 MΩ (Ph-Ph) / 1 MΩ (Ph-N)
	Frequency range		45 to 65 Hz
Input-current characteristics	CT ratings	Primary	Adjustable from 1 A to 32767 A
		Secondary	1 A or 5 A
	Measurement input range		5 mA to 6 A
	Permissible overload		15 A continuous, 50 A for 10 seconds per hour, 120 A for 1 second per hour
	Impedance		< 0.12 Ω
	Load		< 0.15 VA
Power supply	AC		100 to 415 ±10 % V AC, 5 VA; 50-60 Hz
	DC		125 to 250 ±20 % V DC, 3 W
	Ride-through time		100 ms at 120 V AC
Input	Digital inputs (PM750)		12 to 36 V DC, 24 V DC nominal, 12 kΩ impedance, 2.5 kV rms isolation, max. frequency 25 Hz, response time 10 ms
Output	Pulse outputs (PM700P)		3 to 240 V DC or 6 to 240 V AC, 100 mA at 25 °C, derate 0.56 mA per °C above 25 °C, 2.41 kV rms isolation, 30 Ω on-resistance at 100 mA
	Digital or pulse output (PM750)		8 to 36 V DC, 24 V DC nominal at 25 °C, 3.0 kV rms isolation, 28 Ω on-resistance at 100 mA
Mechanical characteristics			
Weight			0.37 kg
IP degree of protection (IEC 60529)			IP52 front display, IP30 meter body
Dimensions			96 x 96 x 69 mm (meter with display) 96 x 96 x 50 mm (behind mounting surface)
Environmental conditions			
Operating temperature	Meter		-5 °C to +60 °C
	Display		-10 °C to +55 °C
Storage temp.	Meter + display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 50 °C (non-condensing)
Pollution degree			2
Metering category			III, for distribution systems up to 277/480 V AC
Dielectric withstand			As per EN 61010, UL508 - Double insulated front panel display
Altitude			3000 m max.
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 commercial environment/FCC part 15 class B EN 55011
Harmonics emissions			IEC 61000-3-2
Flicker emissions			IEC 61000-3-3

(1) *PM700, PM700P, PM710.*
(2) *PM750.*

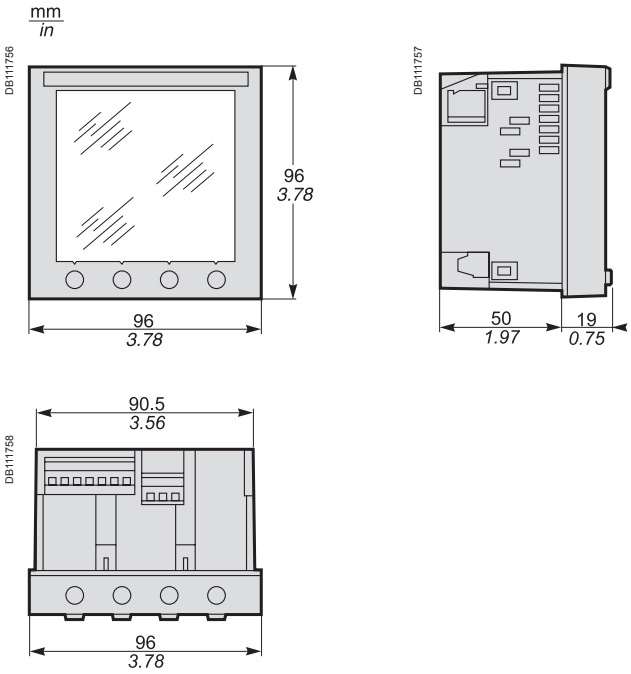
PM700 series
Functions and characteristics (cont.)

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)
Communication	
RS 485 port (PM710 and PM750)	2-wire, up to 19200 bauds, Modbus RTU (double insulation)
Display characteristics	
Dimensions 73 x 69 mm	Green back-lit LCD (6 lines total, 4 concurrent values)

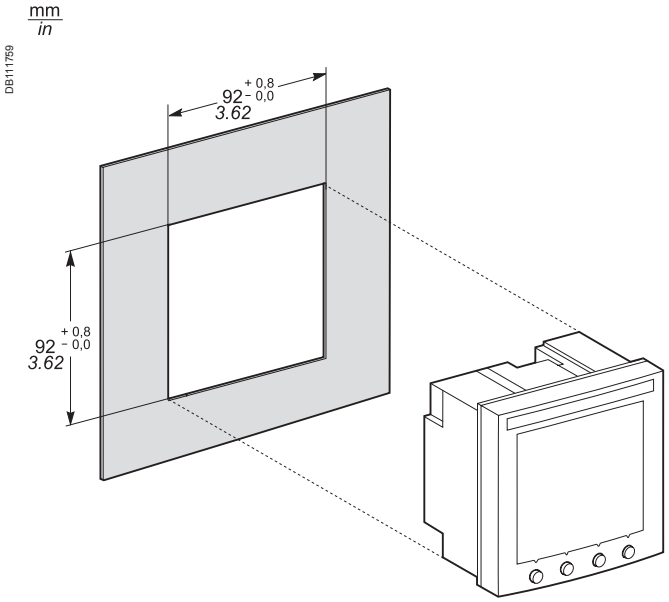
(1) *Protected throughout by double insulation .*

Power Meter Series 700
Installation and connection

Dimensions

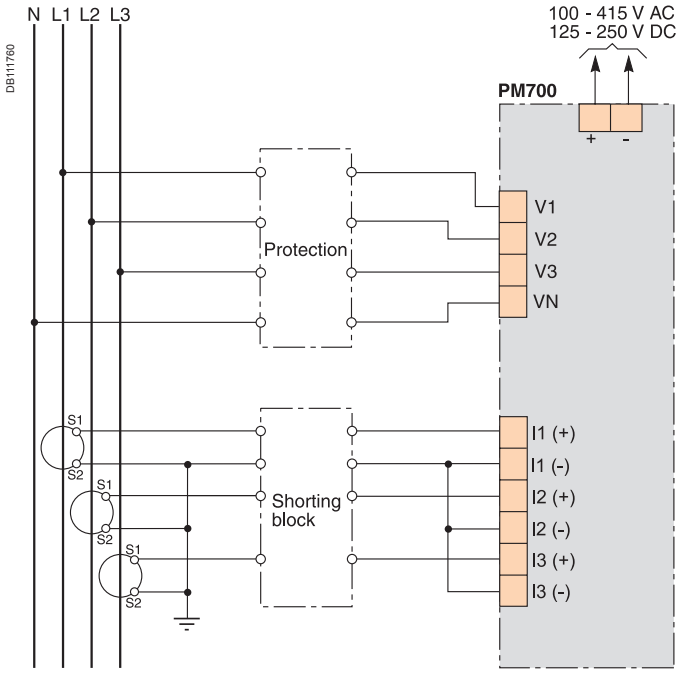


Front-panel mounting



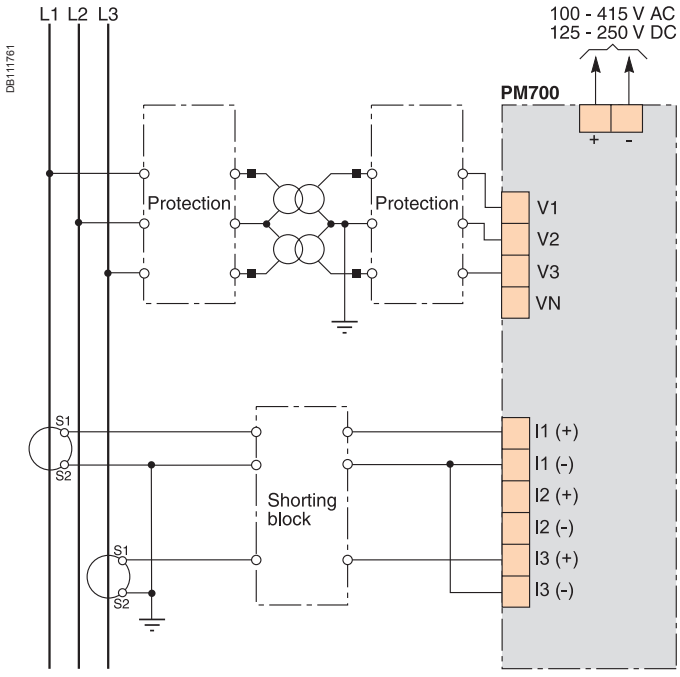
Power Meter Series 700
Installation and connection (cont.)

4-wire connection with 3 CTs and no PT



Connection example.

3-wire connection with 2 CTs and 2 PTs



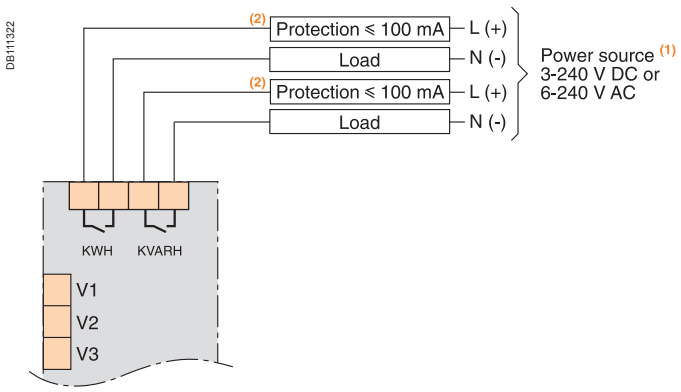
Connection example.

***Note:** other types of connection are possible. See product documentation.*

Power Meter Series 700
Installation and connection (cont.)

PM700P pulse output capabilities

There are two solid-state KY outputs. One is dedicated to kWH and the other to kVARH.
Pulse Output: KY is a solid state pulse output rated for 240 V AC/DC max.

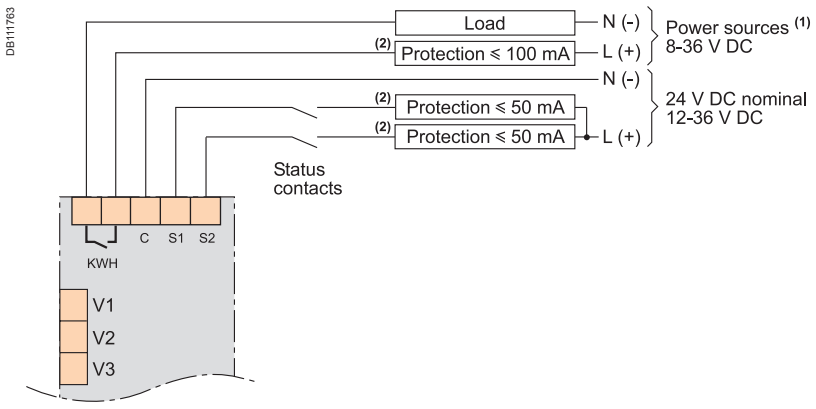


PM700P

(1) The power source should not be a safety extra low voltage (SELV) circuit. Pulse outputs are not SELV rated.
(2) Overcurrent protective device (not supplied). This device must be rated for short circuits at the connection point.

PM750 input/output capabilities

The PM750 has two digital inputs and one digital output. The digital inputs have two operating modes: Normal and Demand Sync.
The digital output has three operating modes: External Control (default), Alarm and kWh Pulse mode. When configured in Alarm mode, the digital output can be controlled by the meter in response to an alarm condition.

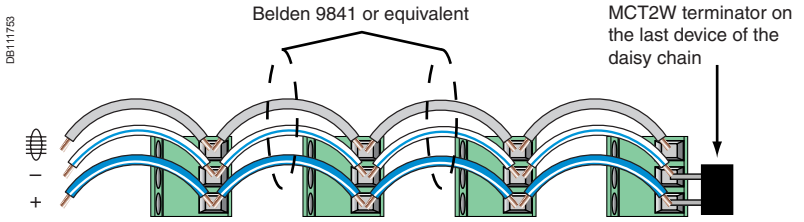


PM750

(1) The power source should not be a safety extra low voltage (SELV) circuit. Pulse outputs are not SELV rated.
(2) Overcurrent protective device (not supplied). This device must be rated for short circuits at the connection point.

Power Meter Series 700
Installation and connection (cont.)

Communications (PM710 and PM750)
2-wire daisy-chain connection of devices (RS 485)



Belden 9841 wire colors: blue with white stripe (+), white with blue stripe (–), and silver (shield).

PM800 series
Functions and characteristics

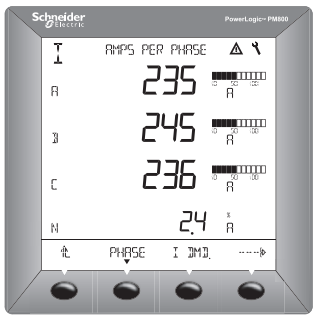
PE86134

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	Schneider Electric	Square D
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**	**PM810U**
PM820 meter unit only, no display, basic instrumentation, THD, alarming, 80 kB logging	**PM820UMG**	**PM820U**
PM850 meter unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, waveform capture	**PM850UMG**	**PM850U**
PM870 meter unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, configurable waveform capture and disturbance detection.	**PM870UMG**	**PM870U**
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**	**PM810**
PM820 meter with integrated display	**PM820MG**	**PM820**
PM850 meter with integrated display	**PM850MG**	**PM850**
PM870 meter with integrated display	**PM870MG**	**PM870**
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**	**PM810RD**
PM820 meter with remote display	**PM820RDMG**	**PM820RD**
PM850 meter with remote display	**PM850RDMG**	**PM850RD**
PM870 meter with remote display	**PM870RDMG**	**PM870RD**
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**	**PM8RD**
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**	**PM8RDA**

Part number list continued on next page.

PM800 series
Functions and characteristics (cont.)

DB119011

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

DB119012

ECC module (front view)

DB119013

ECC module (side view showing LED indicators).

PB101816-34

PowerLogic PM8M26 module.

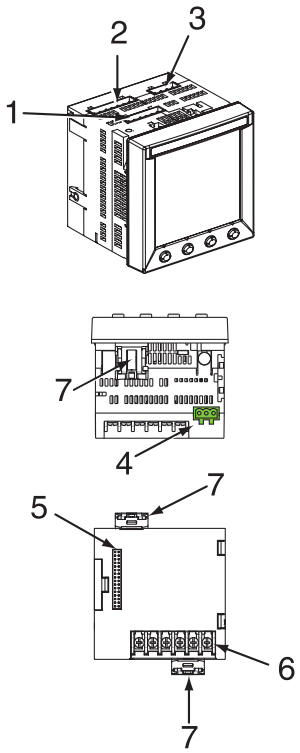
PB101824-50

PowerLogic PM800 with PM8M22 and PM8M26 modules.

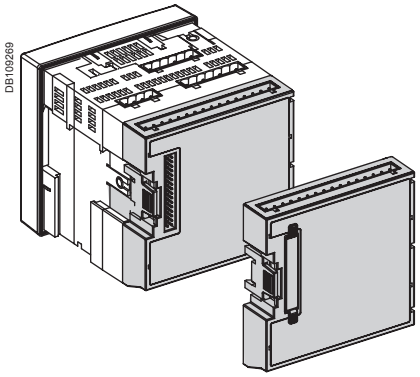
Part Numbers - continued

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
Peformance 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 rate			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.

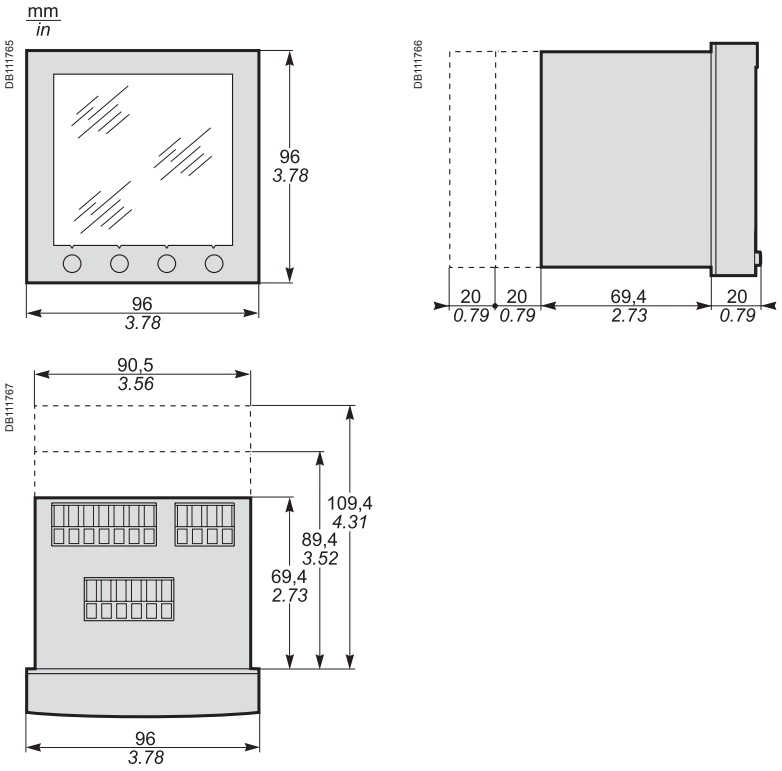
PM800 series
Functions and characteristics (cont.)

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

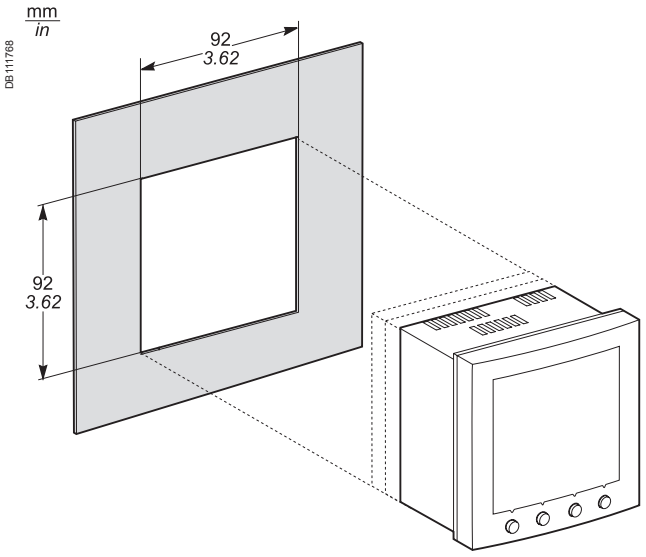
(1) Protected throughout by double insulation.
(2) Waveform capture with PM850 and PM870 only.

Power Meter Series 800
Installation and connection

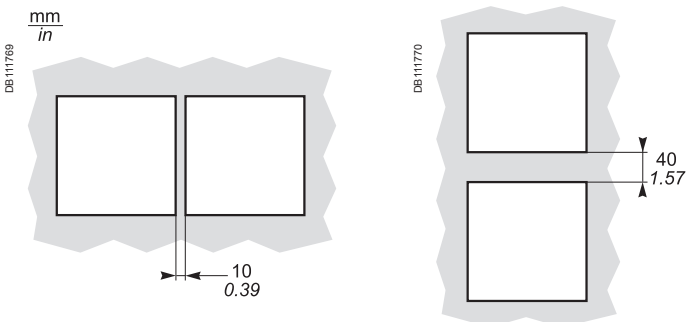
Power meter with integrated display
Dimensions



Front-panel mounting (meter with integrated display)



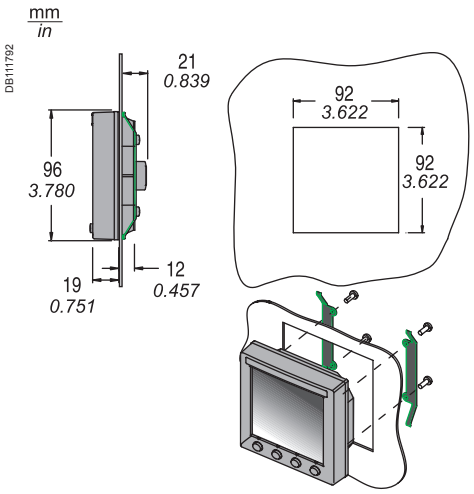
Spacing between units



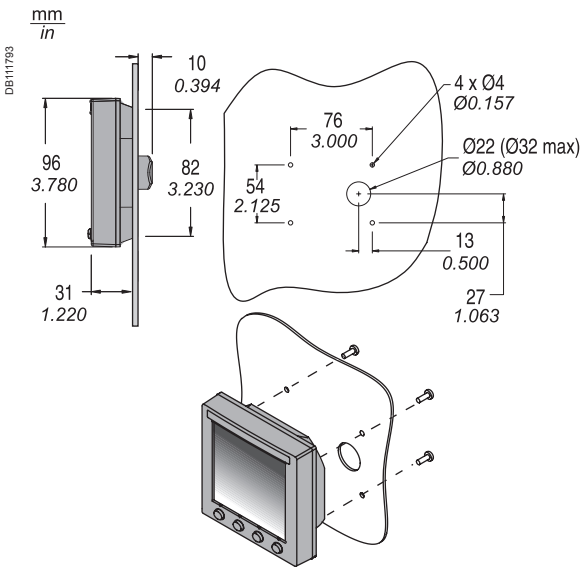
Power Meter Series 800
Installation and connection (cont.)

Remote display door mounting

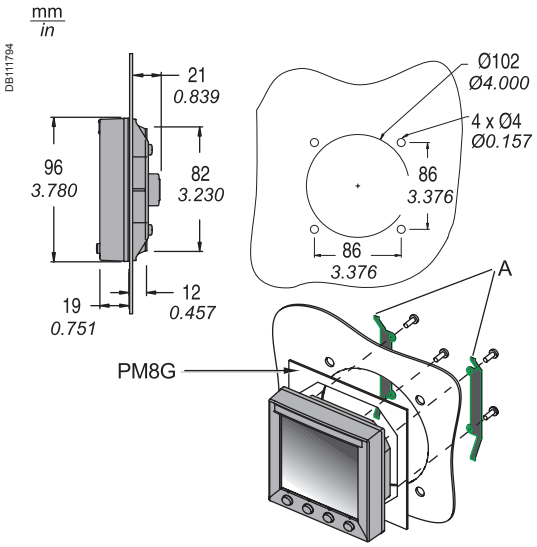
Flush mounting



Surface mount

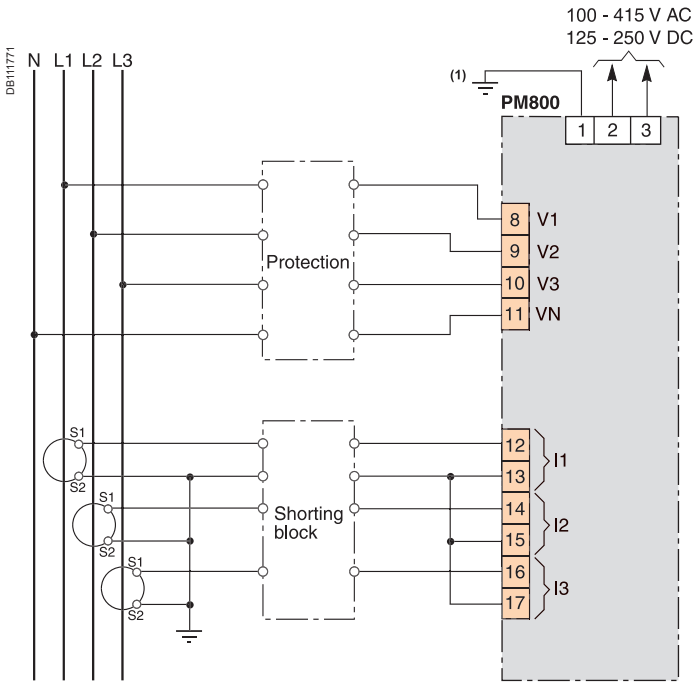


Mounting in a Ø102 cutout (replace analogue device: ammeter, voltmeter, etc.)



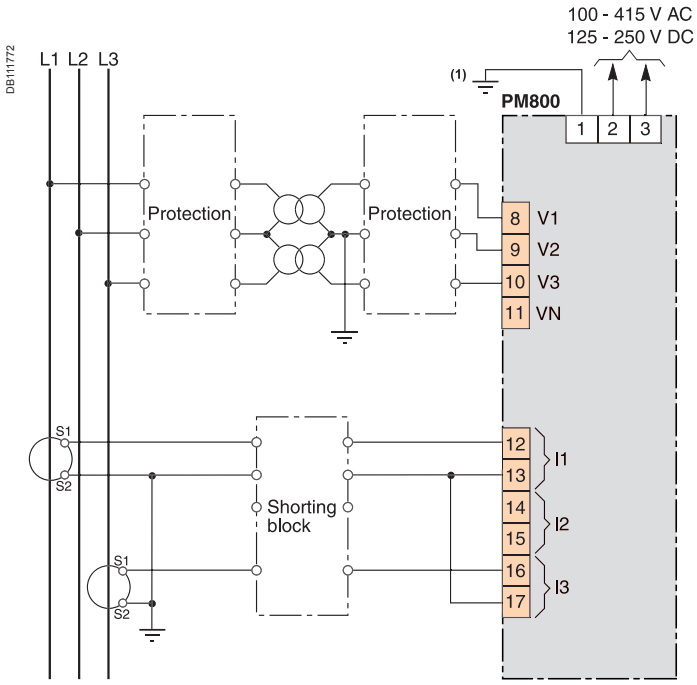
Power Meter Series 800
Installation and connection (cont.)

4-wire connection with 3 CTs and no PT



Connection example.

3-wire connection with 2 CTs and 2 PTs



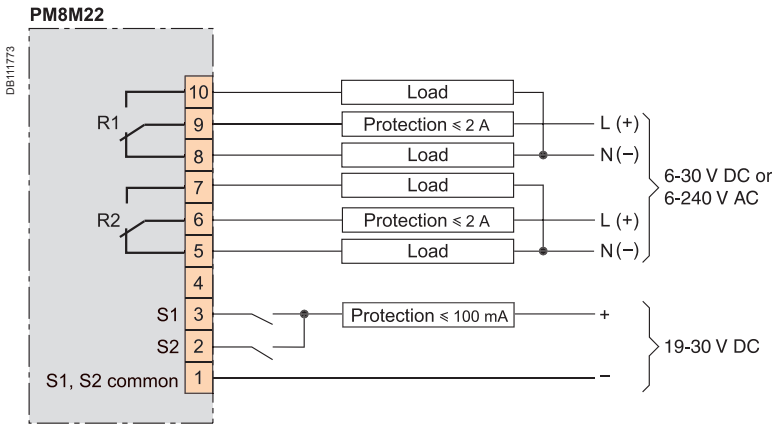
Connection example.

(1) Functional earth terminal.

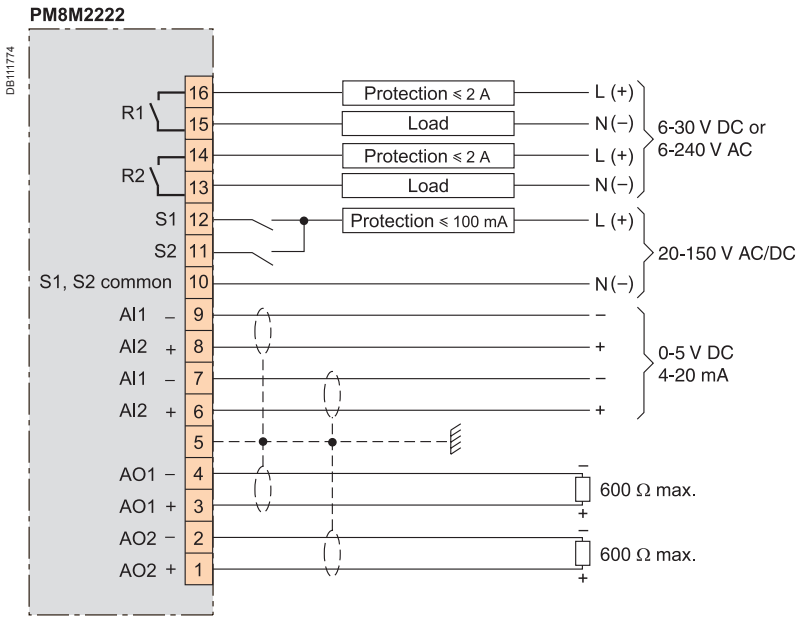
Note: *other types of connection are possible. See product documentation.*

Power Meter Series 800
Installation and connection (cont.)

PM8M22 module

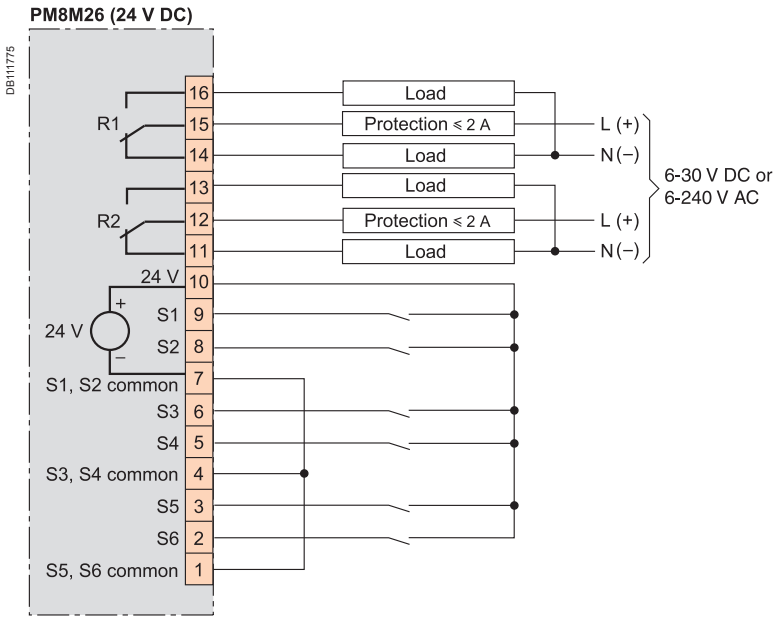


PM8M2222 module

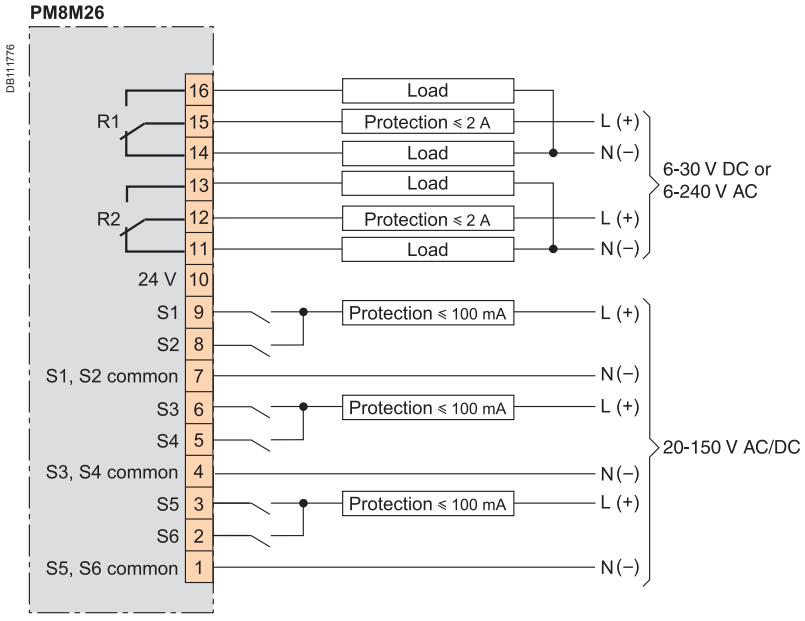


Power Meter Series 800
Installation and connection (cont.)

PM8M26 module internal 24 V DC power supply

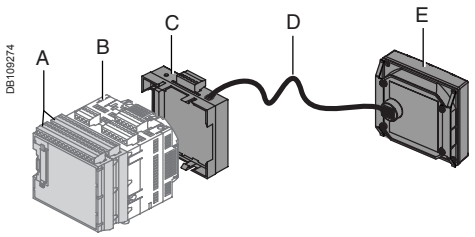


PM8M26 module external power supply



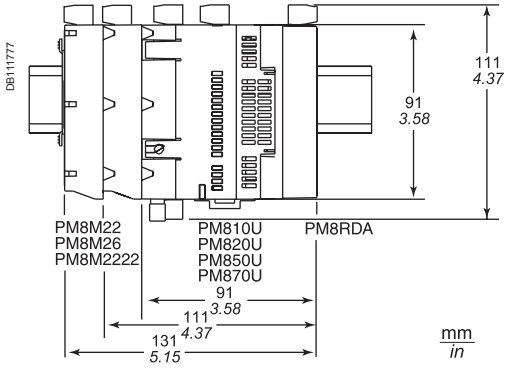
Power Meter Series 800
Installation and connection (cont.)

Remote display kit

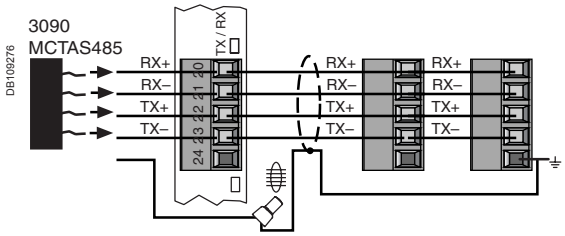


A. I/O modules
B. Power meter 800 series (base unit)
C. Remote display adapter
D. CAB12 cable
E. Remote display (rear view)

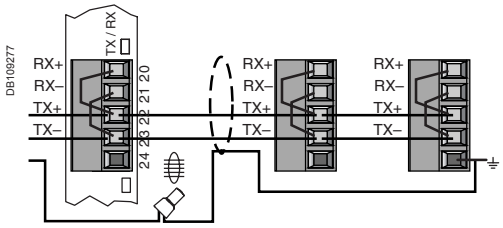
Dimension (meter with I/O and remote display adapter)



4-wire connection (RS 485) of remote display adapter



2-wire connection (RS 485) of remote display adapter



Power Meter Series 800
Installation and connection (cont.)

RS-485 wiring color codes

2-wire connections

Belden 9841 cable:
- (+) blue, white stripe
- (–) white, blue stripe
- (shield)

4-wire connections

Belden 9843 cable:
- (TX+) blue, white stripe
- (TX–) white, blue stripe
- (RX+) orange, white stripe
- (RX–) white, orange stripe
- (SG) green, white stripe
- (unused) white, green stripe
- (shield)

Belden 9842 cable:
- (TX+) blue, white stripe
- (TX–) white, blue stripe
- (RX+) orange, white stripe
- (RX–) white, orange stripe
- (shield)

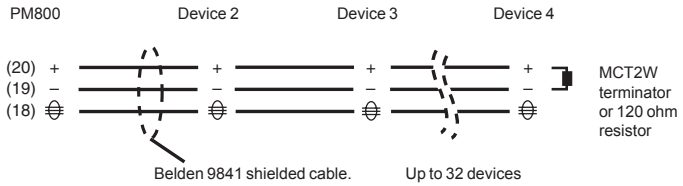
Belden 8723 cable:
- (TX+) green
- (TX–) white
- (RX+) red
- (RX–) black
- (shield)

Surge protection

For surge protection, it is recommend that the PM8ECC signal ground wire be connected directly to an external earth ground at a single point.

PM800 meter unit RS-485 port 2-wire daisy-chain connection

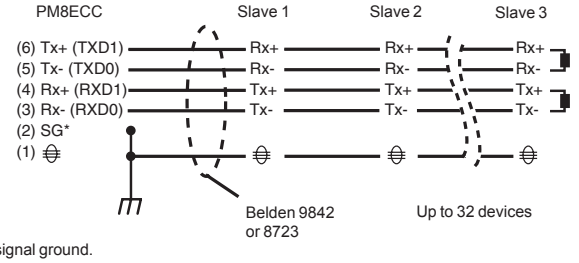
PE86121



Power Meter Series 800
Installation and connection (cont.)

PM8ECC module RS-485 port connections for 4-wire devices that do not support separate signal ground and shield wire

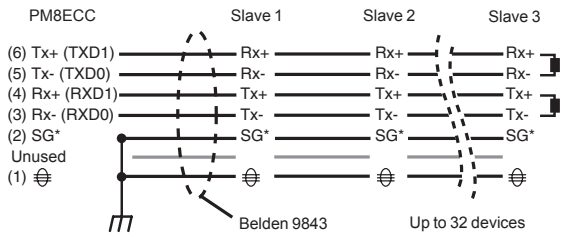
PLSD110343



Note: SG is signal ground.

PM8ECC module RS-485 port connections for 4-wire devices that support separate signal ground and shield wire

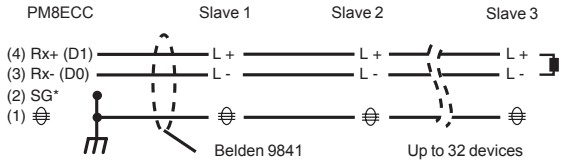
PLSD110351



Note: SG is signal ground.

PM8ECC module RS-485 port connections for 2-wire devices that do not support separate signal ground and shield wire

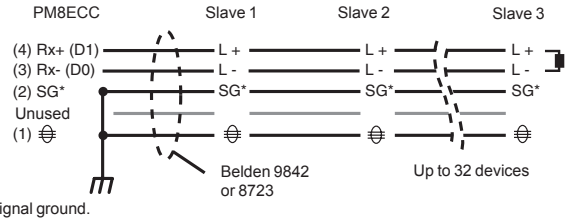
PLSD110344



Note: SG is signal ground.

PM8ECC module RS-485 port connections for 2-wire devices that support separate signal ground and shield wire

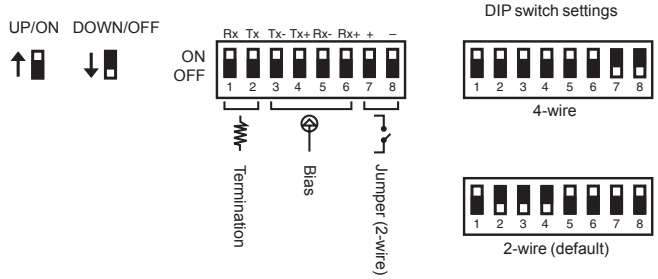
PLSD110352



Note: SG is signal ground.

PM8ECC module RS-485 port biasing and termination

PLSD110345



ION7550 / ION7650
Functions and characteristics

PE86126

PowerLogic™ ION 7650.

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 PowerLogic™ ION Enterprise™ 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

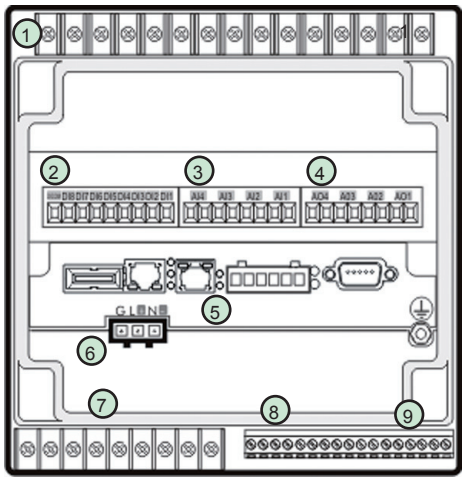
ION7550 / ION7650	
ION7550	**M7550**
ION7650	**M7650**

(1) ION7650 only

See page 99 for order code explanations.

ION7550 / ION7650
Functions and characteristics (cont.)

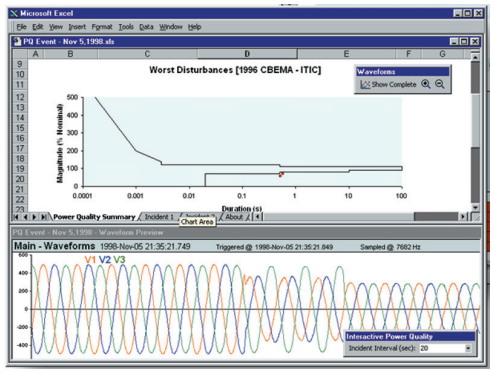
PE86288



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

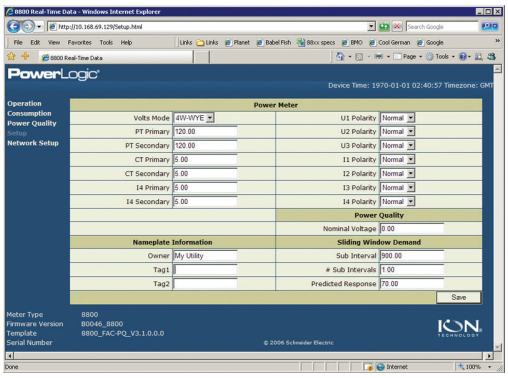
PowerLogic ION7650

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	Measured voltage	Autoranging 57V through 347V LN / 600V LL
	Measurement range	85 to 240VAC and 110 to 330VDC
	Impedance	5 MΩ/phase (phase - Vref)
	Frequency measurement range	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 analog outputs, and/or 4 analog inputs
Mechanical characteristics		
Weight		1.9 kg
IP degree of protection (IEC 60529)		Integrated display, front: IP 50; back: IP 30 Transducer unit (no display): IP 30
Dimensions	Standard model	192 x 192 x 159 mm
	TRAN model	235.5 x 216.3 x 133.1 mm
Environmental conditions		
Operating temperature	Standard power supply	-20 to +70 ºC
	Low voltage DC supply	-20 to +50 ºC
	Display operating range	-20 to +60 ºC
Storage temperature	Display, TRAN	-40 to +85 ºC
Humidity rating		5 to 95% non-condensing
Installation category		III (2000m above sea level)
Dielectric withstand		As per EN 61010-1, IEC 62051-22A(2)
Electromagnetic compatibility		
Electrostatic discharge		IEC 61000-4-2
Immunity to radiated fields		IEC 61000-4-3
Immunity to fast transients		IEC 61000-4-4
Immunity to surges		IEC 61000-4-5
Conducted and radiated emissions		CISPR 22
Safety		
Europe		IEC 61010-1

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

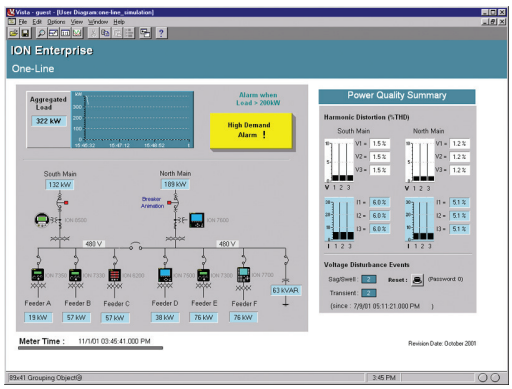
ION7550 / ION7650
Functions and characteristics (cont.)

PE86004



Example WebMeter page showing realtime values.

PE86005



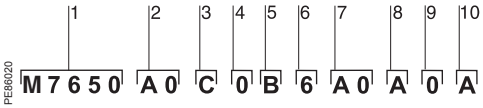
Example showing instantaneous values and alarm.

Communication	
RS 232/485 port (1)	Up to 115,200 bauds (57,600 bauds for RS 485), ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master
RS 485 port (1)	Up to 57,600 bauds, ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master
Infrared port(1)	ANSI type 2, up to 19,200 bauds, ION, Modbus, DNP 3.0
Ethernet port	10Base-T/100Base-TX, RJ45 connector, 100 m link
Fibre-optic Ethernet link	100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link
Protocol	ION, Modbus, TCP/IP, DNP 3.0, Telnet, 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
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.)



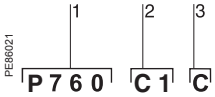
Example ION7650 product part number.

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

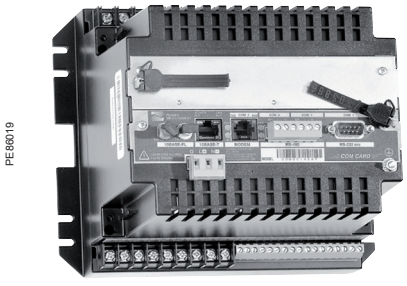
	Item	Code	Description
1	Model	M7650	Advanced meter with wide-range voltage inputs (57-347V line-neutral or 100-600V line-line), transient detection, data and waveform recording, IEC 61000-4-30 Class A & EN50160. Supports ION, IEC 61850 (only for meters with 5MB memory and Ethernet comm card) Modbus-RTU, 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 analog inputs)
		K	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog outputs)
		N	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analog inputs and four 0 to 20 mA outputs)
		P	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 1 analog inputs and four -1 to 1 mA analog outputs)
9	Security	0	Password protected, no hardware lock
		1	Password protected, hardware lockable (enabled/disabled via jumper on comm card)
		6	Password protected with security lock enabled, terminal cover and UK OFGEM labels

ION7650 / ION7550
Functions and characteristics (cont.)



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.*



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

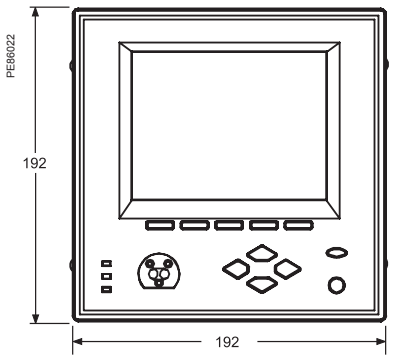
ION7550 / ION7650 related items

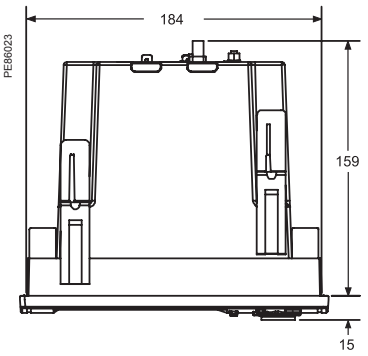
Code	Description
ADPT-37XX-7500	Adapter plate to fit meter into a 3710 or 3720 ACM panel cutout
TERMCVR-7500	Terminal strip cover for the ION7550 or ION7650
M1UB10A1V-10A	10 A / 1 VAC Universal Technic Clamp On Current Probe
P32UEP813-1000A	1000 A / 1 VAC Universal Technic Clamp On Current Probe
P32UEP815-3000A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

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

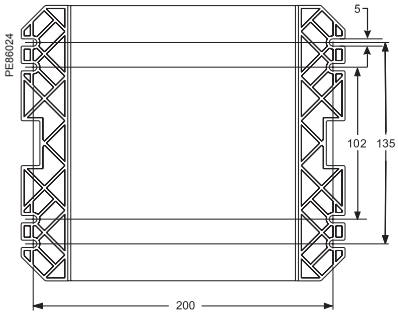
ION7550 / ION7650
Installation and connection

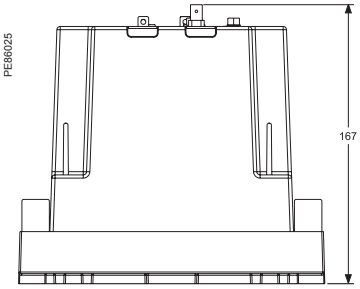
ION7550/ION7650 dimensions

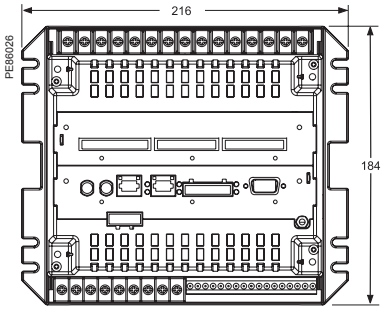




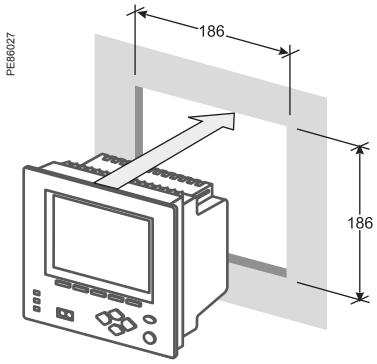
ION7550 / ION7650 TRAN dimensions



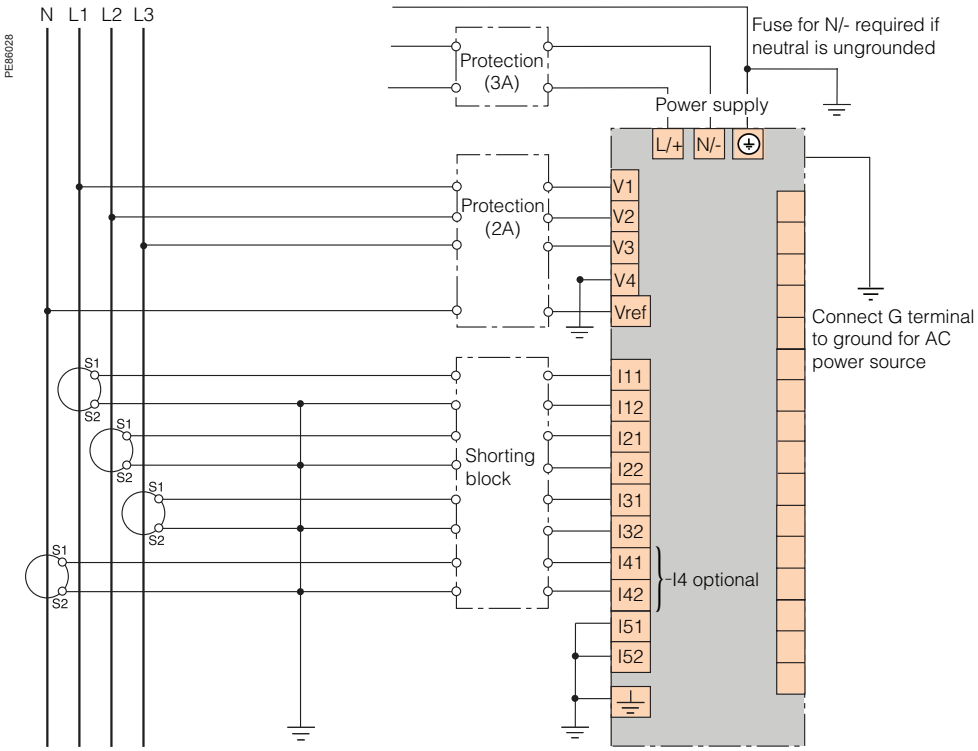




Front-panel mounting

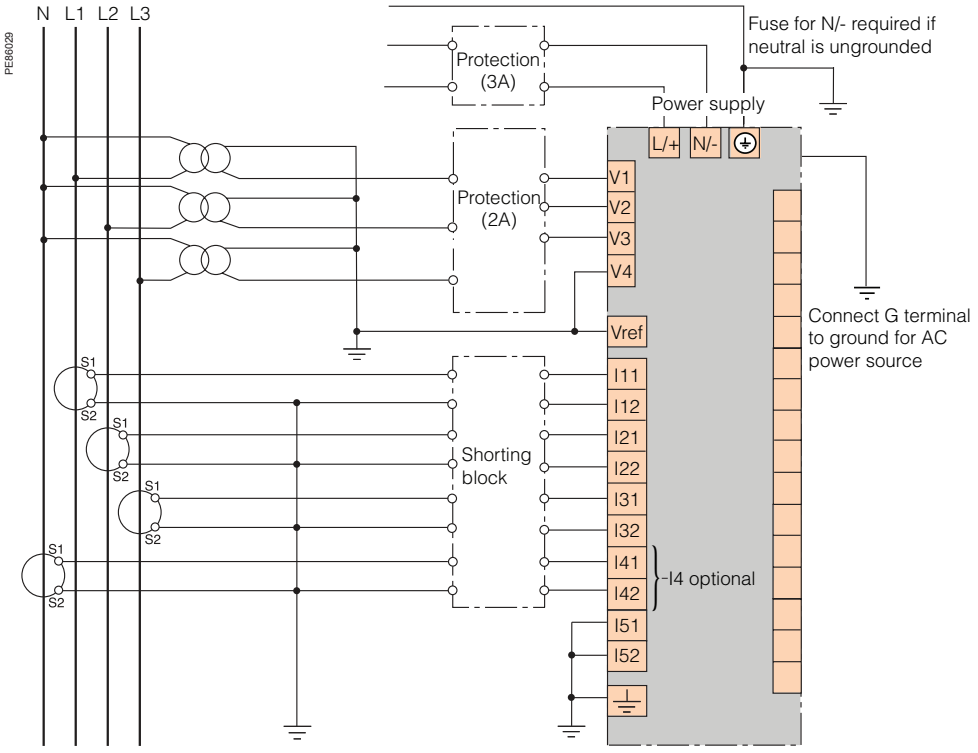


4-wire direct connections



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

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



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

ION8600
Functions and characteristics

DC0R17E

PowerLogic ION8600 socket meter

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

Applications

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

Main characteristics

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

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

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

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

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

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

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

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

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

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

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

Part numbers

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

See page 107 for complete part number descriptions.

Options

See page 108.

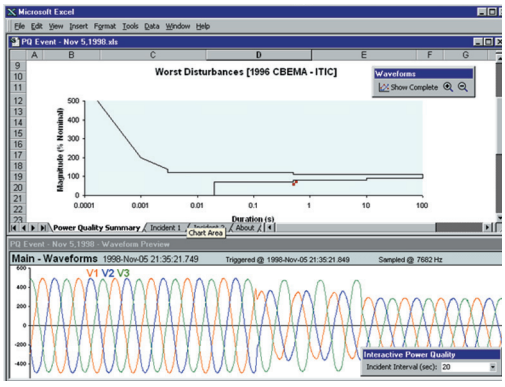
ION8600
Functions and characteristics (cont.)

PE86174

PowerLogic ION8600 socket meter.

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

PE86002



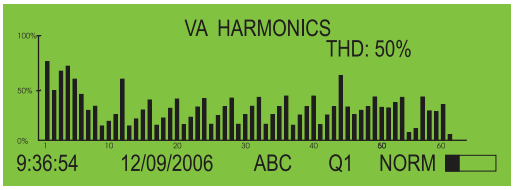
Disturbance waveform capture and power quality report

Selection guide		ION8600A ION8600B	ION8600C
General			
Use on LV and HV systems		■	■
Current accuracy		0.1 % reading	0.1 % reading
Voltage accuracy		0.1 % reading	0.1 % reading
Power accuracy		0.2 %	0.2 %
Nbr of samples/cycle or sample frequency		256	256
Instantaneous rms values			
Current, voltage, frequency (Class 0,2S)		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Current measurement range (autoranging)		0.01 - 20A	0.01 - 20A
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current	Present and max. values	■	■
Active, reactive, apparent power	Present and max. values	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Demand modes: Block (sliding), thermal (exponential)		■	■
Power quality measurements			
Harmonic distortion	Current and voltage	■	■
Individual harmonics	Via front panel	63	31
	Via ION Enterprise	127 (1)	-
Waveform capture		■ (1)	-
Detection of voltage swells and dips		■	■
Adaptive waveform capture		■ (1)	-
Detection and capture of transients		■ (1)	-
Flicker		■ (1)	-
High speed data recording (down to 10 ms)		■	-
EN50160 compliance checking		■	■
Programmable (logic and math functions)		■	■
Data recording			
Min/max of instantaneous values		■	■
Data logs		■	■
Event logs		■	■
Trending/forecasting		■	■
Alarms (optional automatic alarm setting)		■	■
Alarm notification via email (Meterm@il)		■	■
SER (Sequence of event recording)		■	■
Time stamping		■	■
GPS synchronisation		■	■
Memory (in Mbytes)		10 (1), 4 (2)	2
Display and I/O			
Front panel display		■	■
Wiring self-test		■	■
Pulse output (front panel LED)		2	2
Digital or analogue inputs (3) (max)		11	11
Digital or analogue outputs (3) (max, including pulse output)		16	16
Direct connection voltage		277V (4)	277V (4)
Communication			
RS 485 / RS 232 port		1	1
RS 485 port		1	1
Infrared port		1	1
Ethernet port (Modbus/TCP/IP protocol) with gateway		1	1
HTML web page server (WebMeter)		■	■
Internal modem with gateway (ModemGate)		1	1
IRIG-B port (unmodulated IRIG B00x time format)		1	1
Modbus TCP Master / Slave (Ethernet port)		■ / ■	- / ■
Modbus RTU Master / Slave (Serial ports)		■ / ■	- / ■
DNP 3.0 through serial, modem, and I/R ports		■	■

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

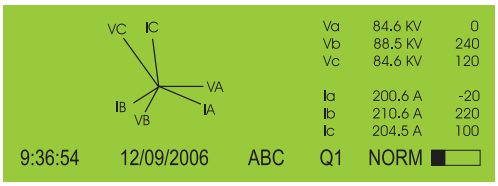
ION8600
Functions and characteristics (cont.)

PE86041



PowerLogic ION8600 front panel harmonic display.

PE86042



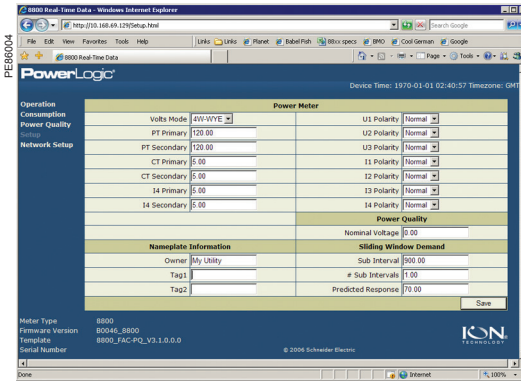
ION8600 front panel phasor display and table.

Electrical characteristics		
Type of measurement		True rms up to the 63rd harmonic Up to 256 samples per cycle Up to 5 kHz for transient events
Measurement accuracy	Current and voltage	0.1 % Reading
	Power	0,2%
	Frequency	±0.005 Hz
	Power factor	0.5%
	Energy	IEC 62053-22/23 (0,2S)
Data update rate		0.5 cycle or 1 second (depending on value)
Input-voltage characteristics	Measured voltage	57V to 277V autoranging (9S) 120V to 480V autoranging (35S)
	Overload	120 - 277 (+/-20%) VLN rms, 6 hours max[1] (standard); 57.7 - 69.3 (+/- 20%) VLN rms, 6 hours max[1] (low voltage); 120 - 480 (+/- 20%) VLL rms, 6 hours max[1] (35S)
	Impedance	5 MΩ /phase (phase-Uref/Ground)
	Inputs	V1, V2, V3, VREF
Input-current characteristics	Rated nominal/current class	5 A and/or 10 A (Standard, class 10/20) 1 A, 2 A and 5 A (Optional, class 1/10)
	Measurement range	0.05 - 20 A autoranging (standard range) 0.01 - 10 A autoranging (optional range)
	Permissible overload	500A rms for 1 second, non-recurring (standard) 200A rms for 1 second, non-recurring (optional)
	Impedance	0.002 Ω per phase (Standard IEC 5 A and 10 A) 0.015 Ω per phase (Optional IEC 1 A to 10 A)
	Burden	Low current switchboard: 0.025VA per phase at 1A; Standard switchboard - 0.20VA per phase at 5A; All socket mounts - 0.05VA per phase at 5A
Power supply	Standard power supply, 120-277 VAC	120-277 VLN RMS (-15%/+20%) 47-63 Hz or 120-480 VLN RMS (-15%/+20%) 47-63 Hz (35S)
	Standard (low voltage) power supply, 57-70 VAC	57-70 (-15%/+20%) VLN RMS, 47-63 Hz 35S unavailable
	Auxiliary power cable assembly, 65-120 VAC	AC: 65-120 (+/- 15%) VLN RMS, 47-63 Hz DC: 80-160 (+/- 20%) VDC
	Auxiliary power cable assembly, 160-277 VAC	AC: 160-277 (+/- 20%) VLN RMS, 47-63 Hz DC: 200-350 (+/- 20%) VDC
	Ride-through time, 120-277 VAC (Standard power supply)	Min 100 ms (6 cycles at 60 Hz at 96 VAC), 200 ms (12 cycles at 60 Hz at 120 VAC), 800 ms (48 cycles at 60 Hz at 240 VAC)
	Ride-through time, 57-70 VAC (Low voltage supply)	Min 100 ms or 6 cycles 60 Hz at 46 VAC
Input/outputs	Digital outputs (Form C)	4 Solid state relays (130 V AC/ 200 V DC) 100 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, 50Hz, 1 min
Electromagnetic compatibility		
Electrostatic discharge		IEC 61000-4-2
Immunity to radiated fields		IEC 61000-4-3
Immunity to fast transients		IEC 61000-4-4
Immunity to surge		IEC 61000-4-5
Immunity conducted		IEC61000-4-6
Damped oscillatory waves immunity		IEC61000-4-12
Conducted and radiated emissions		CISPR 22 (class B)
Safety		
Europe		As per IEC62052-11
North America		As per ANSI C12.1

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

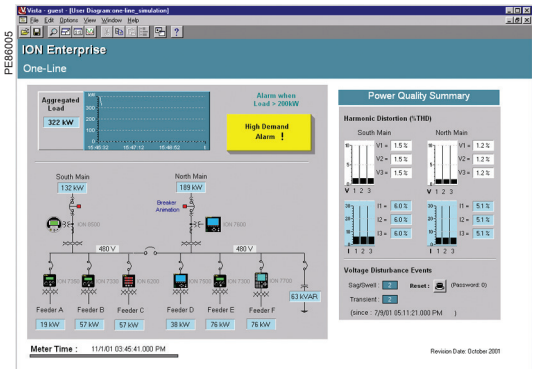
ION8600
Functions and characteristics (cont.)

PE86004



Example embedded webserver page (WebMeter) showing realtime values.

PE86005

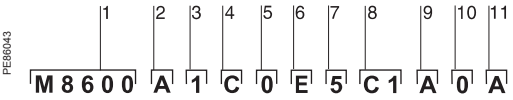


Communication	
RS 232 / RS 485 port (COM1)	User-selectable RS 232 or RS 485. 300 - 115,200 bauds (RS485 limited to 57,600 bps); protocols: ION, Modbus/RTU, DNP 3.0, GPSTRUETIME/DATUM.
Internal modem port (COM2)	300 bps-56k bps (automatic detection supported)
ANSI 12.18 Type II optical port (COM3)	Up to 19200 bauds
RS 485 port (COM4)	Up to 57,600 bauds, Modbus, direct connection to a PC or modem
Ethernet port	10/100 BaseTX, RJ45 connector, 100 m link, protocols: DNP TCP, ION, Modbus TCP, Modbus Master
EtherGate	Up to 31 slave devices via serial portsat 10Mbytes/sec.
ModemGate	Up to 31 slave devices
Embedded web server (WebMeter)	4 standard pages, up to 5 customisable pages
Firmware characteristics	
High-speed data recording	Up to 1/2-cycle interval burst recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined setpoint, or from external equipment. Can log data only during critical event to conserve memory
Harmonic distortion	Up to 127th harmonic for all voltage and current inputs (feature set A, via ION Enterprise operations software)
Dip/swell detection	Analyse severity/potential impact of dips and swells: - magnitude and duration data suitable for plotting on voltage tolerance curves - per phase triggers for waveform recording or control operations
Instantaneous	High accuracy (1s) or high-speed (1/2 cycle) measurements, including true rms per phase / total for: - voltage and current - active power (kW) and reactive power (kVAR) - apparent power (kVA) - power factor and frequency - voltage and current unbalance - phase reversal
Load profiling	Channel assignments are user configurable: - 800 channels via 50 data recorders (feature set A), - 320 channels via 20 data recorders (feature set B), - 32 channels via two data recorders (feature set C). Configure for historical trend recording of energy, demand, voltage, current, power quality, other measured parameter. Recorders can trigger on time interval basis, calendar schedule, alarm/event condition, manually.
Waveform captures	Simultaneous capture of all voltage and current channels - sub-cycle disturbance capture (16 to 256 samples/cycle) - maximum cycles is 214,000 (16 samples/cycle x 96 cycles, 10Mbytes memory)
Alarms	Threshold alarms: - adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm - user-defined priority levels - boolean combination of alarms possible
Advanced security	Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user priviledges.
Transformer correction	Correct for phase / magnitude inaccuracies in current transformers (CTs), potential transformers (PTs)
Memory	2 Mbytes (C), 4 Mbytes (B), 10 Mbytes (A)
Firmware update	Update via the communication ports
Display characteristics	
Type	FSTN transreflective LCD
Backlight	LED
Languages	English

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

ION8600
Functions and characteristics (cont.)

PE86043



Example product part number.

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

PE86132

PowerLogic ION8600 meter with switchboard case

Part Numbers

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

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

ION8600
Functions and characteristics (cont.)

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

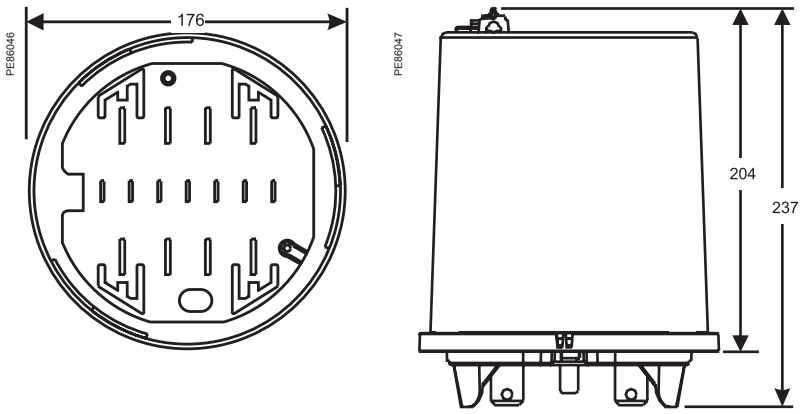
1 *Digital / Analog I/O.*
2 *I/O option.*
3 *Cable option.*

Part numbers (cont.)

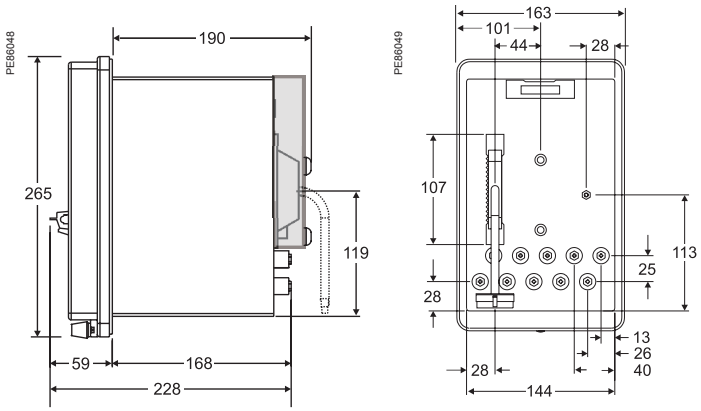
I/O Expander		
Digital/Analog I/O	**P850E**	Schneider Electric I/O Expander for ION8600 meters: Inputs and Outputs for energy pulsing, control, energy counting, status monitoring, and analog interface to SCADA.
I/O option	**A**	External I/O box with 8 digital inputs and 8 digital outputs (4 Form A, 4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

ION8600
Installation and connections

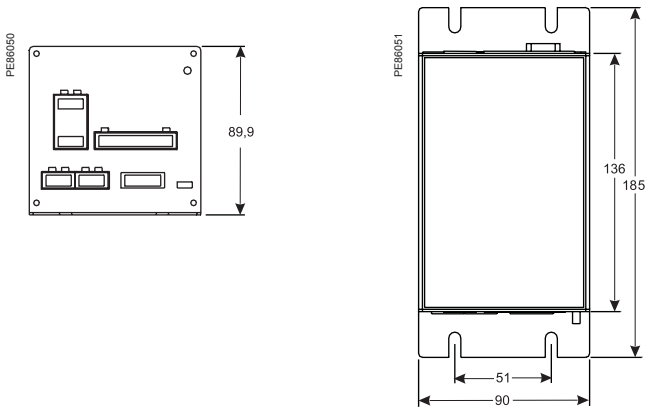
ION8600 socket dimensions



ION8600 switchboard dimensions

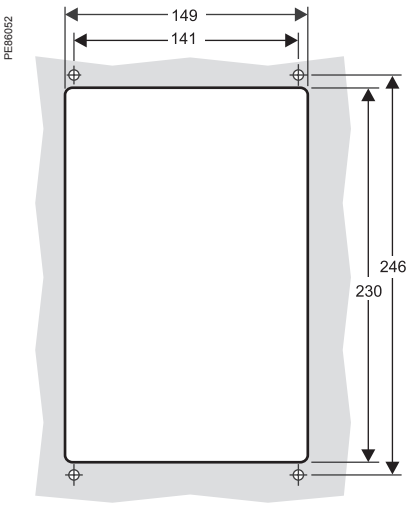


I/O Expander dimensions

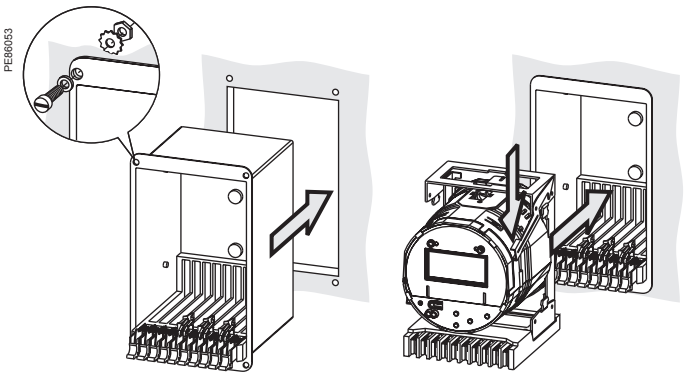


ION8600
Installation and connections (cont.)

ION8600 suggested switchboard mounting dimensions

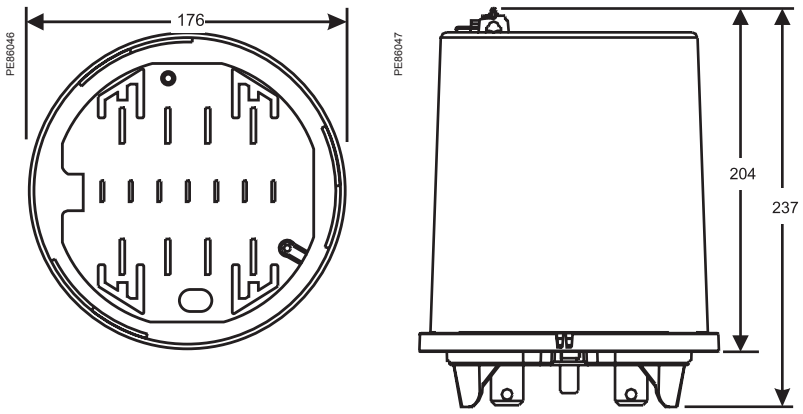


ION8600 switchboard mounting

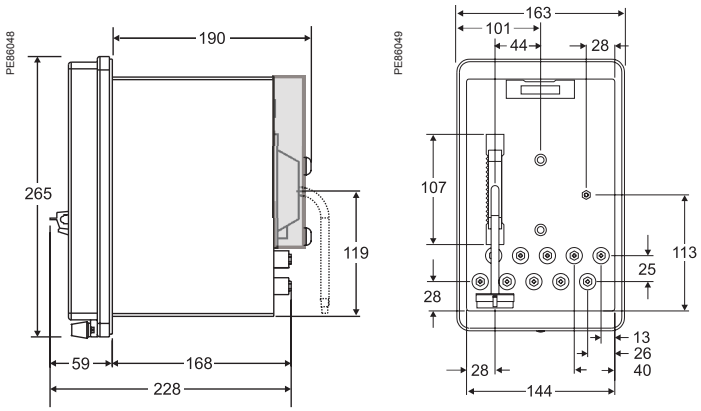


ION8600
Installation and connections (cont.)

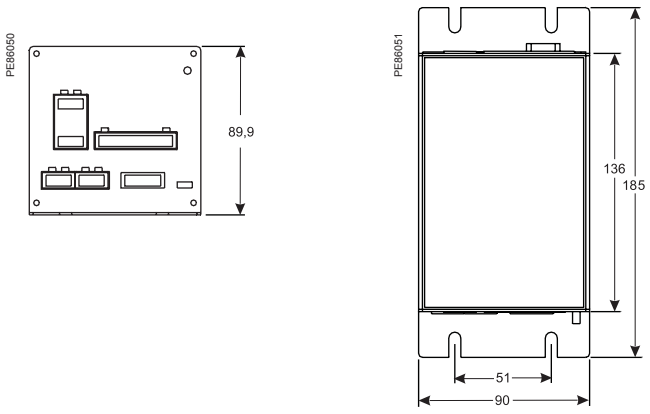
ION8600 socket dimensions



ION8600 switchboard dimensions



I/O Expander dimensions



ION8650
Functions and characteristics

PE86300-60

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 ION Enterprise™ operations software or other energy management and SCADA systems through multiple communication channels and protocols, including Itron MV-90.

Applications

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

Main characteristics

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 (IEEE 519, IEC 61000-4-30 Class A/S, EN50160, IEC 61000-4-7, IEC 61000-4-15, CBEMA/ITIC)

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

Complete communications
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 control functions
A total of 65 setpoints are configurable for 1-second or ½ - cycle operation.

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

Integrate with software
Easily integrate with ION Enterprise operations software or other energy management systems; MV90, DNP, Modbus, IEC 61850.

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

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

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

Part numbers

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

See page 6 for complete part number descriptions.

Options

See page 7.

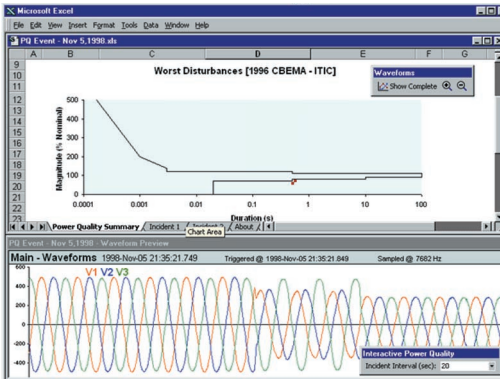
ION8650
Functions and characteristics (cont.)

PE86302-95

PowerLogic ION8650 socket meter.

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

PE86002

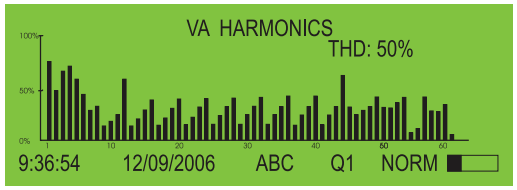


Disturbance waveform capture and power quality report

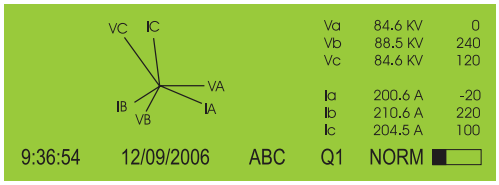
Selection guide		ION8650 A	ION8650 B	ION8650 C
General				
Use on LV and HV systems		■	■	■
Current accuracy		0.1 % reading	0.1 % reading	0.1 % reading
Voltage accuracy		0.1 % reading	0.1 % reading	0.1 % reading
Power accuracy		0.1 %	0.1 %	0.1 %
Nbr of samples/cycle or sample frequency		1024	1024	1024
Instantaneous rms values				
Current, voltage, frequency (Class 0,2S)		■	■	■
Active, reactive, apparent power	Total & per phase	■	■	■
Power factor	Total & per phase	■	■	■
Current measurement range (autoranging)		0.01 - 20A	0.01 - 20A	0.01 - 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
	Via ION Enterprise	127	127	-
Waveform capture		■	-	-
Harmonics: magnitude, phase, and interharmonics		40	-	-
Detection of voltage swells and dips		■	■	■
Detection and capture of transients		■	-	-
Flicker		■	-	-
High speed data recording (down to 10 ms)		■	-	-
EN50160 compliance checking		■	■	-
Programmable (logic and math functions)		■	■	■
Data recording				
Min/max of instantaneous values		■	■	■
Data logs		■	■	■
Event logs		■	■	■
Trending/forecasting		■	■	■
Alarms (optional automatic alarm setting)		■	■	■
Alarm notification via email		■	■	■
SER (Sequence of events recording)		■	■	■
Time stamping to 1 ms		■	■	■
GPS synchronisation		■	■	■
Memory (in Mbytes)		128	64	32
Display and I/O				
Front panel display		■	■	■
Wiring self-test		■	■	■
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
Direct connection voltage		277V(2)	277V(2)	277V(2)
Communication				
RS 485 / RS 232 port		1	1	1
RS 485 port		1	1	1
Infrared port		1	1	1
Ethernet port (Modbus/TCP/IP protocol) with gateway		1	1	1
HTML web page server (WebMeter)		■	■	■
Internal modem with gateway (ModemGate)		1	1	1
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.*

ION8650
Functions and characteristics (cont.)



PowerLogic ION8650 front panel harmonic display.



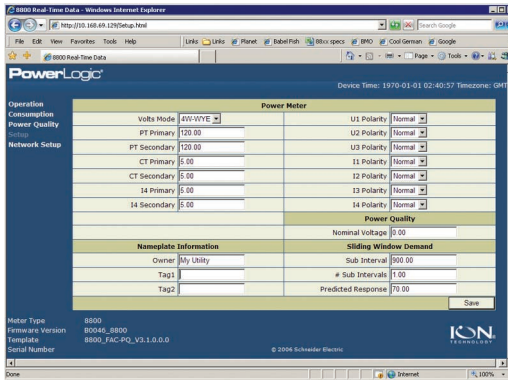
ION8650 front panel phasor display and table.

Electrical characteristics		
Type of measurement		True rms up to the 63rd harmonic Up to 1024 samples per cycle Up to 5 kHz for transient events
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 IEC 62053-22/23 (0,2S) or ANSI Class 0.2
Data update rate		0.5 cycle or 1 second (depending on value)
Input-voltage characteristics	Measured voltage	57V to 277V autoranging (9S) 120V to 480V autoranging (35S)
	Overload	120 - 277 (+/-20%) VLN rms, 6 hours max[1] (standard); 6 hours max[1] (low voltage); 120 - 480 (+/- 20%) VLL rms, 6 hours max[1] (35S)
	Impedance	5 MΩ /phase (phase-Uref/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)
	Measurement range	0.01 - 20 A autoranging (standard range)
	Permissible overload	500A rms for 1 second, non-recurring (standard)
	Impedance	0.002 Ω per phase (Standard IEC 5 A and 10 A)
	Burden	Switchboard - 0.20VA per phase at 5A; Socket - 0.05VA per phase at 5A
Power supply	Standard power supply, 120-277 VAC	120-277 VLN RMS (-15%/+20%) 47-63 Hz or 120-480 VLN RMS (-15%/+20%) 47-63 Hz (35S)
	Auxiliary power cable assembly, 65-120 VAC	AC: 65-120 (+/- 15%) VLN RMS, 47-63 Hz DC: 80-160 (+/- 20%) VDC
	Auxiliary power cable assembly, 160-277 VAC	AC: 160-277 (+/- 20%) VLN RMS, 47-63 Hz DC: 200-350 (+/- 20%) VDC
	Ride-through time, 120-277 VAC (Standard power supply)	Min 100 ms (6 cycles at 60 Hz at 96 VAC), 200 ms (12 cycles at 60 Hz at 120 VAC), 800 ms (48 cycles at 60 Hz at 240 VAC)
Input/outputs	Digital outputs (Form C)	4 Solid state relays (130 V AC/ 200 V DC) 100 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, 50Hz, 1 min
Electromagnetic compatibility		
Electrostatic discharge		IEC 61000-4-2
Immunity to radiated fields		IEC 61000-4-3
Immunity to fast transients		IEC 61000-4-4
Immunity to surge		IEC 61000-4-5
Immunity conducted		IEC61000-4-6
Damped oscillatory waves immunity		IEC61000-4-12
Conducted and radiated emissions		CISPR 22 (class B)
Safety		
Europe		As per IEC62052-11
North America		As per ANSI C12.1

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

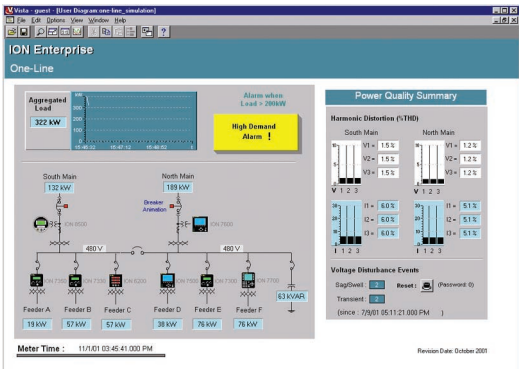
ION8650
Functions and characteristics (cont.)

PE86004-C



Example embedded webserver page (WebMeter) showing realtime values.

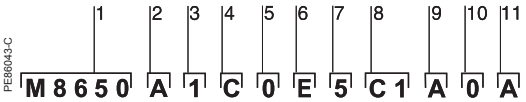
PE86005-C



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, DNP 3.0, GPSTRUETIME/DATUM.
Internal modem port (COM2)	300 bps-57,600 bauds (automatic detection supported)
ANSI 12.18 Type II optical port (COM3)	Up to 19200 bauds
RS 485 port (COM4)	Up to 57,600 bauds, Modbus, direct connection to a PC or modem
Ethernet port	10/100 BaseT, RJ45 connector, 100 m link, protocols: DNP, ION, Modbus, IEC 61850, Modbus Master
EtherGate	Up to 31 slave devices via serial ports at 10Mbytes/sec.
ModemGate	Up to 31 slave devices
Embedded web server (WebMeter)	4 standard pages, up to 5 customisable pages
Firmware characteristics	
High-speed data recording	Up to 1/2-cycle interval burst recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined setpoint, or from external equipment. Can log data only during critical event to conserve memory
Harmonic distortion	Up to 127th harmonic for all voltage and current inputs (feature set A/B, via ION Enterprise operations software)
Dip/swell detection	Analyse severity/potential impact of dips and swells: - magnitude and duration data suitable for plotting on voltage tolerance curves - per phase triggers for waveform recording or control operations
Instantaneous	High accuracy (1s) or high-speed (1/2 cycle) measurements, including true rms per phase / total for: - voltage and current - active power (kW) and reactive power (kVAR) - apparent power (kVA) - power factor and frequency - voltage and current unbalance - phase reversal
Load profiling	Channel assignments are user configurable: - 800 channels via 50 data recorders (feature set A), - 320 channels via 20 data recorders (feature set B), - 64 channels via four 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) - maximum cycles limited by available log memory
Alarms	Threshold alarms: - adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm - user-defined priority levels - boolean combination of alarms possible
Advanced security	Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user priviledges.
Transformer correction	Correct for phase / magnitude inaccuracies in current transformers (CTs), potential transformers (PTs)
Memory	32 Mbytes (C), 64 Mbytes (B), 128 Mbytes (A)
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.*

PowerLogic ION8650 meter with switchboard case

PE86320-59

Part Numbers

Item		Code	Description
1	Model	M8650	Schneider Electric advanced tariff 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	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 9S, 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, low end measurement range limited to 120 V L-L.
		H	Auxiliary Power Pigtail: 65-120 VAC or 80-160 VDC (power from external source)
		J	Auxiliary Power Pigtail: 160-277 VAC or 200-350 VDC (power from external source)
7	System Frequency	5	Calibrated for 50 Hz systems.
		6	Calibrated for 60 Hz systems.
8	Communications	A 0	Infrared optical port, RS 232/RS 485 port, RS 485 port
		C 1	Infrared optical port, Ethernet (10/100 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)
		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)
		E 0	Infrared optical port, Ethernet (10/100 BaseT), RS 232/485 port, RS 485 port (note: in addition to infrared optical port, Feature Set C can use any two ports (configurable)).
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

ION8650
Functions and characteristics (cont.)

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

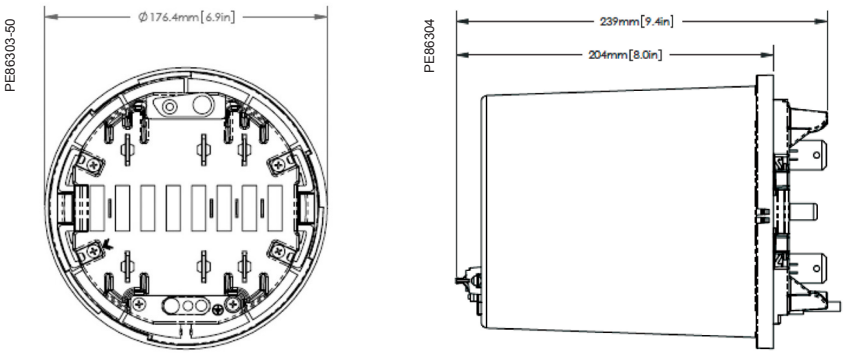
1 *Digital / Analog I/O.*
2 *I/O option.*
3 *Cable option.*

Part numbers (cont.)

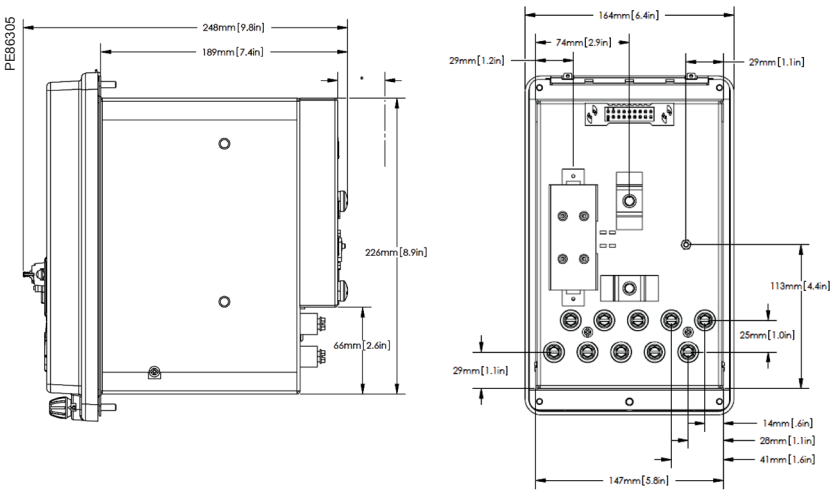
I/O Expander		
Digital/Analog I/O	**P850E**	Schneider Electric I/O Expander for ION8600 meters: Inputs and Outputs for energy pulsing, control, energy counting, status monitoring, and analog interface to SCADA.
I/O option	**A**	External I/O box with 8 digital inputs and 8 digital outputs (4 Form A, 4 Form C)
	B	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (0 to 20mA)
	C	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (-1mA to 1mA)
	D	External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (two -1 to 1 mA, and two 0 to 20 mA outputs)
Cable option	**0**	No cable - 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		5ft Breakout Cable: 24-pin female Molex connector to one DB9 female connector for RS 232, and 2 sets of twisted pair wires for two RS 485 port connections
CBL-8X00IOE5FT		5ft extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin female Molex connector on the I/O Expander box (not for use with breakout panel E8, F8 & G8 form factors)
CBL-8X00IOE15FT		15ft extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin female Molex connector on the I/O Expander box (not for use with breakout panel E8, F8 & G8 form factors)
CBL-8XX0-BOP-IOBOX		6ft connector cable, 24-pin male to 14-pin male Molex connector for connecting an ION8650 meter with breakout panel to an I/O Expander Box

ION8650
Installation and connections

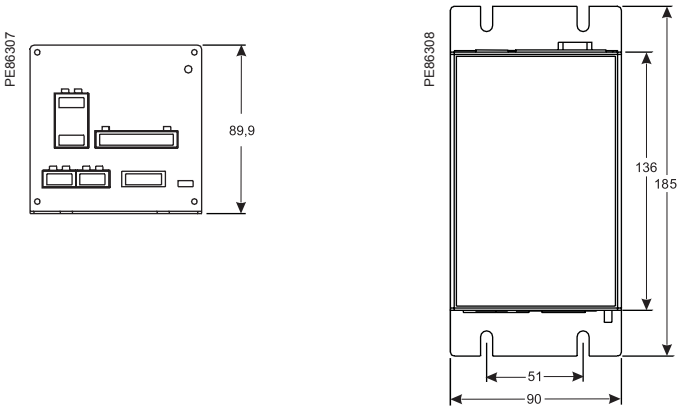
ION8650 socket dimensions



ION8650 switchboard dimensions



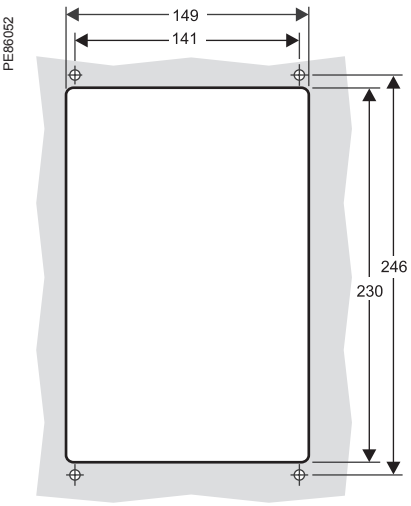
I/O Expander dimensions



ION8650
Installation and connections (cont.)

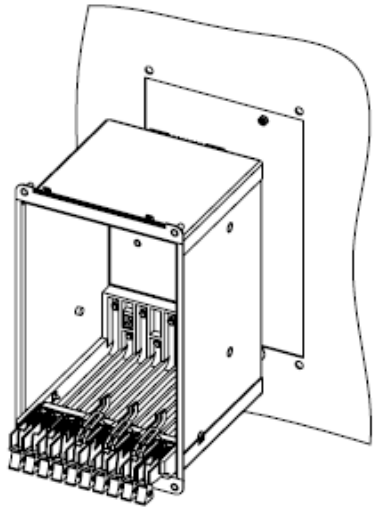
ION8650 suggested switchboard mounting dimensions

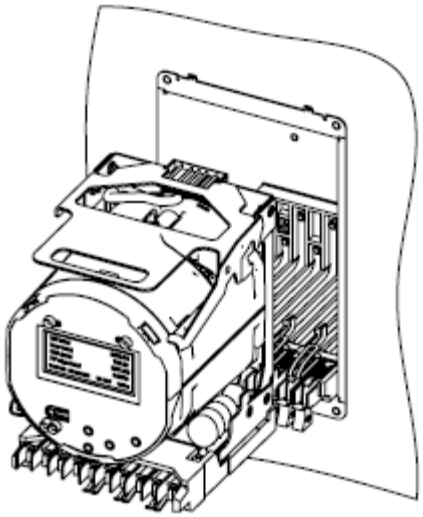
PE86052



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 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
Measure compliance to quality-of-supply standards (EN 50160, IEEE 1159, ITI (CBEMA), SARFI) with calculations based on international measurement standards (IEC 61000-4-30 class A, IEC 61000-4-7, IEC 61000-4-15).

Power quality summary
Consolidate all power quality characteristics into a single trendable index.

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

Complete communications
Use the IEC1107 optical port or the optional communications module that supports concurrent Ethernet (10BaseFL or 10BaseT), 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.

Alarm and control functions
Use a total of 65 setpoints for single/multi-condition alarms and control functions with a 1-second response.

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 ION Enterprise or other energy management systems; MV90, UTS.

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

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

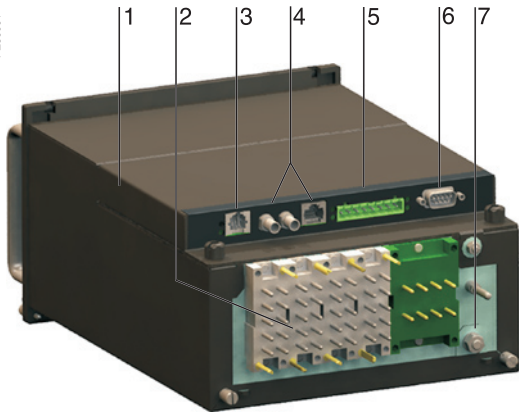
Part numbers[1]

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

[1]Representative part numbers only. See page 124 for complete part number descriptions.

ION8800
Functions and characteristics (cont.)

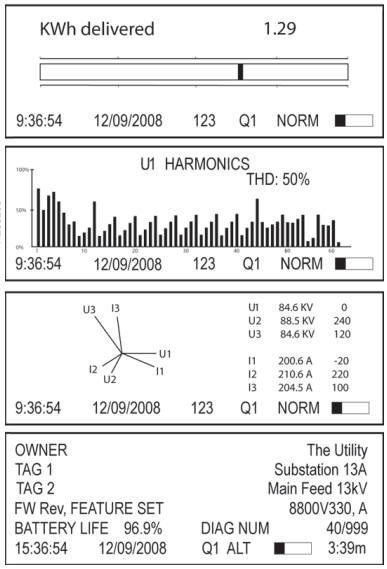
PE86001



PowerLogic ION8800 meter

1 *Optional communications module.*
2 *Essailec connectors.*
3 *Internal modem.*
4 *Optional 10BaseT or 10BaseFL 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 MV and HV systems		■	■
Current accuracy (1A to 5A)		0.1 % reading	0.1 % reading
Voltage accuracy (57V to 288V)		0.1 % reading	0.1 % reading
Power accuracy		0.2 %	0.2 %
Nbr of samples/cycle or sample frequency		1024	1024
Instantaneous rms values			
Current, voltage, frequency (Class 0,2S)		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Current measurement range (low-current option)		0.001 - 6A	0.001 - 6A
Current measurement range (high-current option)		0.005 - 10A	0.005 - 10A
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation modes		■	■
Demand values			
Current		■	■
Active, reactive, apparent		■	■
Predicted active, reactive, apparent		■	■
Setting of calculation mode (block, sliding, thermal, predicted)		■	■
Power quality measurements			
Detection of voltage sags and swells		10 ms	10 ms
Symmetrical components: zero, positive, negative		■	-
Transient detection, microseconds (50 Hz)		20 (1)	-
Harmonics: individual, even, odd, total up to		63rd	63rd
Harmonics: magnitude, phase and inter-harmonics		50th	-
EN 50160 compliance		■	
IEC 61000-4-30 class A		■	
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 cycles	800(1) 640(2)	32
Waveform logs	Maximum # of cycles	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)		■	■
Power line time synchronisation		■	■
Memory expandable up to		10 Mbytes	10 Mbytes
Display and I/O			
Front panel display		■	■
Active/reactive energy pulser, LED and IEC 1107 style port		■	■
Digital pulse outputs, optional	Solid state Form A	8	8
Digital pulse outputs	Solid state Form C	4	4
Alarm relay output	Form C	1	1
Digital inputs (optional)		3	3
Communications			
RS 232/485 port		1	1
RS 485 port		1	1
Ethernet port		1	1
IEC 1107 optical port		1	1
Internal modem		1	1
3-port DNP 3.0 through serial, modem, Ethernet and I/R ports		■	■
Modbus RTU master / slave (serial, modem and I/R ports)		■ / ■	- / ■
Modbus TCP master / slave (via Ethernet port)		■ / ■	- / ■
Data transfer between Ethernet and RS 485 (EtherGate)		■	■
Data transfer between internal modem, RS 485 (ModemGate)		■	■
Alarms, single or multi-condition		■	■
Alarm notification & logged data via email		■	■
Embedded web server (WebMeter)		■	■

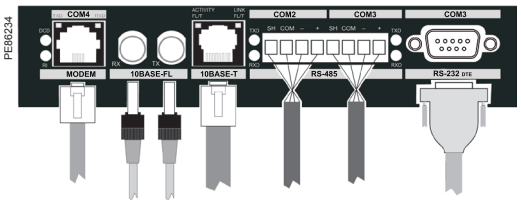
(1) *ION8800A only.*
(2) *ION8800B only.*

ION8800
Functions and characteristics (cont.)

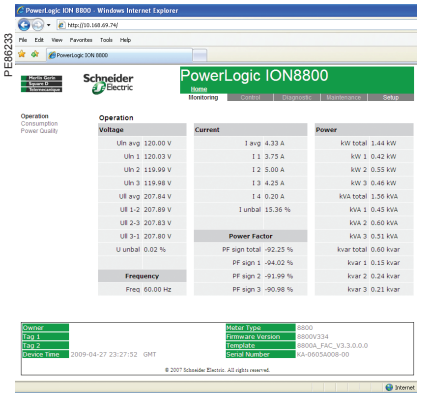
PowerLogic ION8800 with optional communications module.

Electrical characteristics		
Type of measurement		True rms Up to 1024 samples per cycle
Measurement accuracy	Current and voltage	0.1 % reading
	Power	0.2 % reading
	Frequency	±0.005 Hz
	Power factor	0.5%
	Energy	IEC 62053-22/23 Class 0.2 S
Data update rate		½ cycle or 1 second (depending on value)
Input-voltage characteristics	Inputs	V1, V2, V3, Vref
	Measurement range	57-288 LN VAC rms (99-500 LL VAC rms)
	Dielectic withstand	3320 VAC rms at 50 Hz (60 s)
	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 at 50 Hz (60 s)
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
Operating temperature		-25°C to +55°C
Display operating range		-10°C to +60°C
Storage temperature		-25°C to +70°C
Humidity rating		5 to 95 % RH non-condensing
Pollution degree		2
Installation category		III
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		

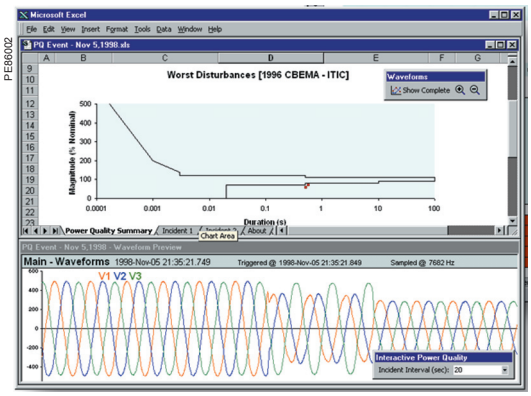
ION8800
Functions and characteristics (cont.)



Ports on the optional communications module.



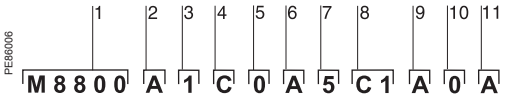
Example embedded webserver page (WebMeter) showing realtime values.



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
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
Embedded web server (WebMeter)	5 customisable pages, new page creation capabilities, HTML/XML compatible
Firmware characteristics	
High-speed data recording	Up to ½-cycle interval burst recording, stores detailed characteristics of disturbances or outages Trigger recording by a user-defined setpoint, or from external equipment.
Harmonic distortion	Up to 63rd harmonic for all voltage and current inputs
Dip/swell detection	Analyse severity/potential impact of sags and swells: - magnitude and duration data suitable for plotting on voltage tolerance curves - per phase triggers for waveform recording or control operations
Instantaneous	High accuracy (1s) or high-speed (½ cycle) measurements, including true rms per phase / total for: - voltage and current - active power (kW) and reactive power (kvar) - apparent power (kVA) - power factor and frequency - voltage and current unbalance - phase reversal
Load profiling	Channel assignments (800 channels via 50 data recorders) are configurable for any measureable parameter, including historical trend recording of energy, demand, voltage, current, power quality, or any measured parameter Trigger recorders based on time interval, calendar schedule, alarm/event condition, or manually.
Modbus Master	Master up to 32 slave devices per serial channel and store their data at programmable intervals. Use this data to aggregate and sum energy values and perform complex totalization.
Waveform captures	Simultaneous capture of all voltage and current channels - sub-cycle disturbance capture - maximum cycles is 214,000 (16 samples/cycle x 96 cycles, 10 Mbytes memory) - 1024 samples/cycle
Alarms	Threshold alarms: - adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm - user-defined priority levels - boolean combination of alarms possible
Advanced security	Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user priviledges.
Transformer correction	Correct for phase / magnitude inaccuracies in current transformers (CTs), potential transformers (PTs)
Memory	5 -10 Mbytes (specified at time of order)
Firmware update	Update via the communication ports
Display characteristics	
Type	FSTN transreflective LCD
Backlight	LED
Languages	English

ION8800
Functions and characteristics (cont.)



Example product part number.

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

Part Numbers

Item	Code	Description
1 Model	M8800	ION8800 IEC/DIN 43862 19" rack mount series meter with integrated display, V1-V3 wide-range voltage inputs (57-288 VAC L-N or 99-500 VAC L-L). I1-I3 current inputs with additional I4. Supports ION, Modbus-RTU, DNP 3.0 and DLMS protocols. English and French documentation ships with every meter. For onboard I/O see comments below.
2 Feature Set	A	Feature Set B + power quality analysis (waveforms and transient capture with 1024 samples/cycle resolution).
	B	Feature Set C plus EN50160 compliant power quality monitoring.
	C	Basic tariff/energy revenue meter with sag/swell monitoring.
3 Memory/Form Factor	1	10 MB logging memory, Essailec connectors.
	2	5 MB logging memory, Essailec connectors.
4 Current Inputs	C	(I1-I3): Configured for 5 A nominal, 10 A full scale, 14 A fault capture, 0.005 A starting current.
	E	(I1-I3): Configured for 1 A nominal, 10 A full scale, 14 A fault capture, 0.001 A starting current.
5 Voltage Inputs	0	(V1-V3): Autoranging (57-288 VAC L-N or 99-500 VAC L-L)
6 Power Supply	B	Single phase power supply: 85-240 VAC ±10% (47-63 Hz) or 110-270 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

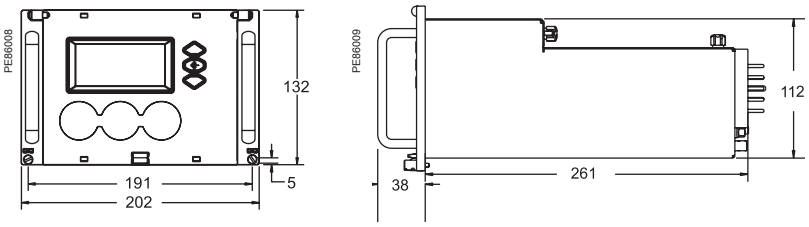
Item	Code	Description
P880C	A0	Standard communications: 1 RS-232/RS-485 port, 1 RS-485 port (COM2)(1).
	C1	Standard communications plus 10Base-T Ethernet (RJ45), 56k universal internal modem (RJ11).
	D1	Standard communications plus 10Base-T Ethernet (RJ45) / 10Base-FL Ethernet Fiber, 56k universal internal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

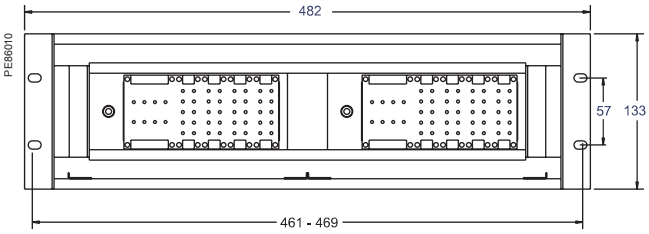
Note: *The part number above should conform to the following format: P880C A0 A.*

ION8800
Installation and connections

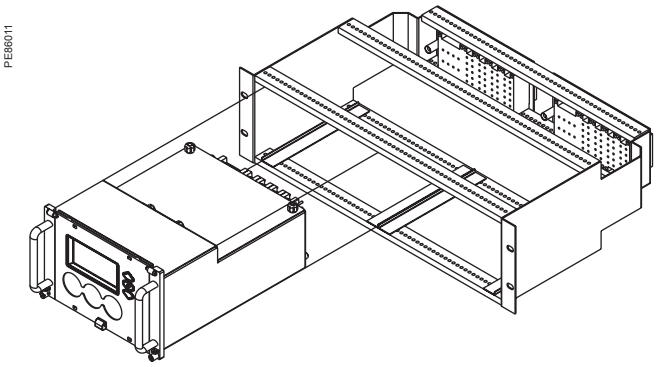
ION8800 dimensions



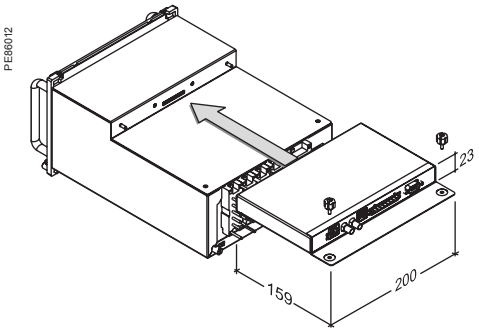
ION8800 Essailec rack dimensions



Rack mounting the ION8800

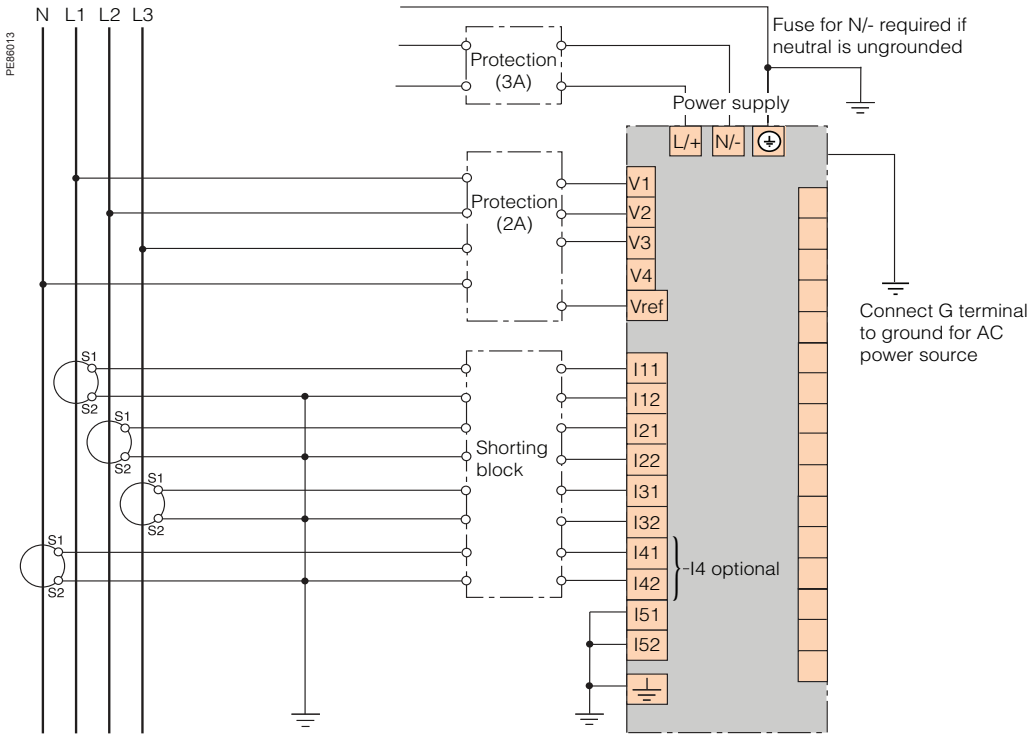


ION8800 communication module dimensions



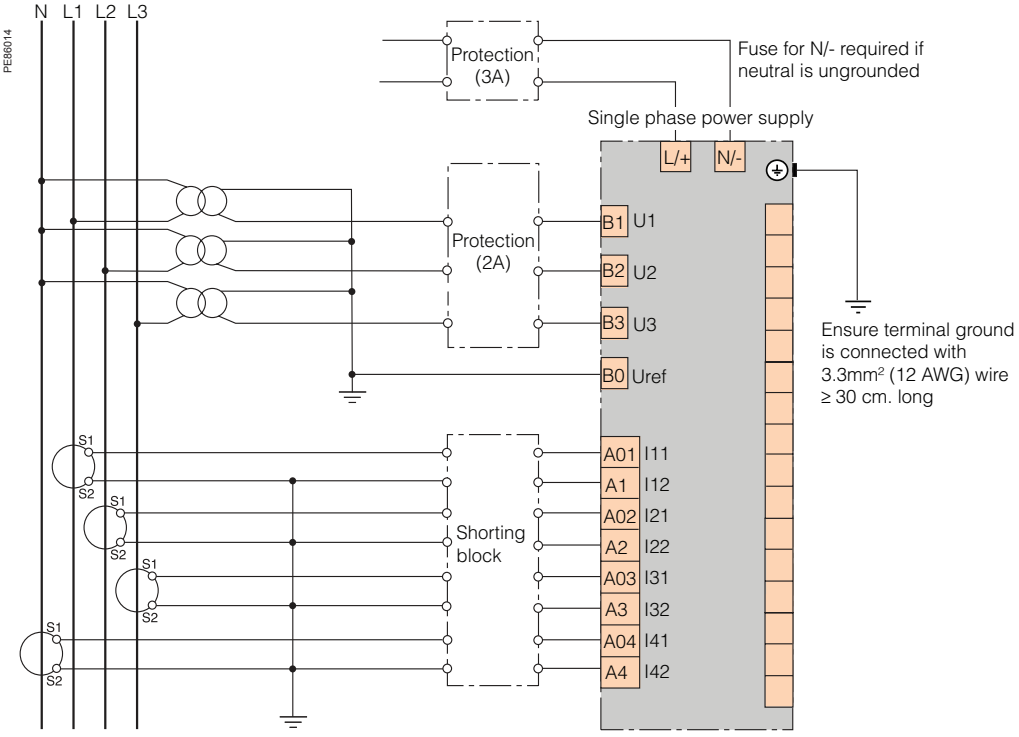
ION8800
Installation and connection (cont.)

4-wire 3 element direct connection



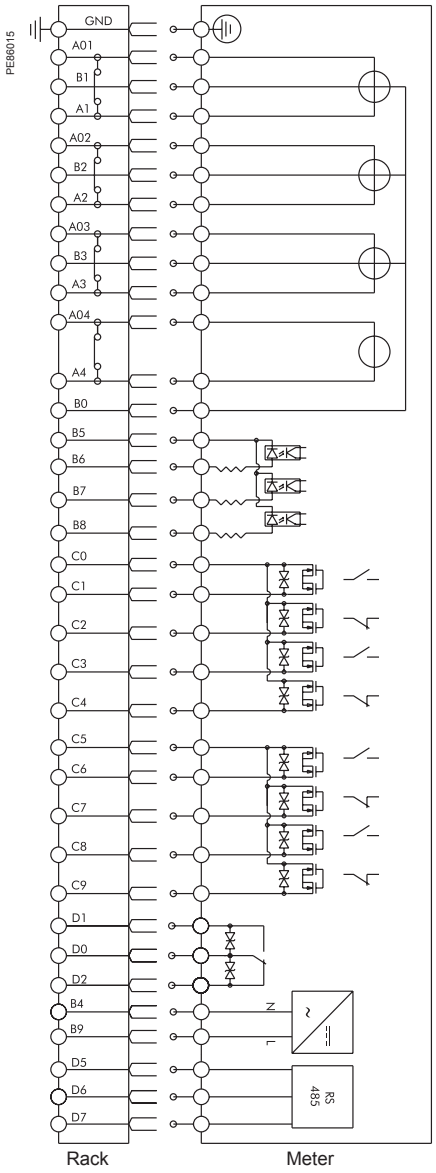
Connection representation only. See product installation guide for complete wiring and communication connection details.

4-wire 3 element 3 PT connection



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

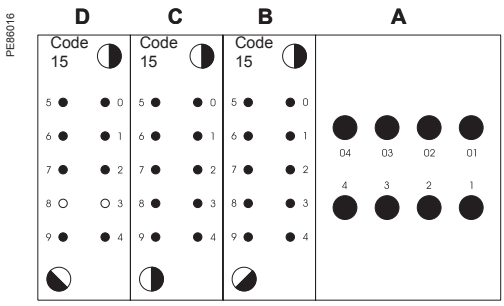
ION8800
Installation and connection (cont.)



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

***(1)** Option not currently available.*

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



Communication interfaces and associated services

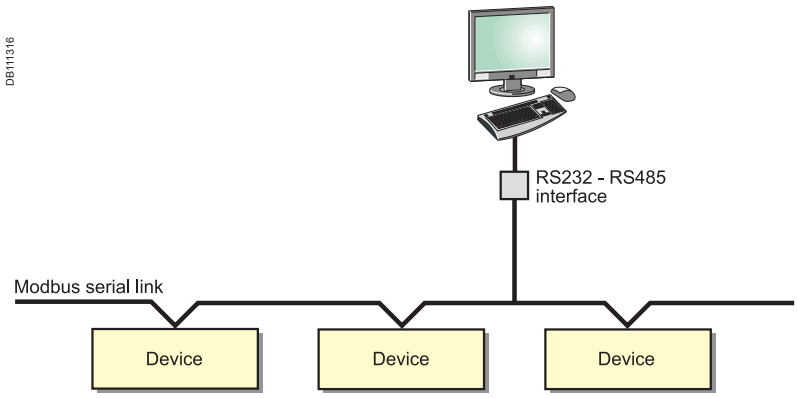
Switchboard-data acquisition and monitoring make it possible to anticipate events. In this way, they reduce customer costs in terms of operation, maintenance and investment.

Serial link

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

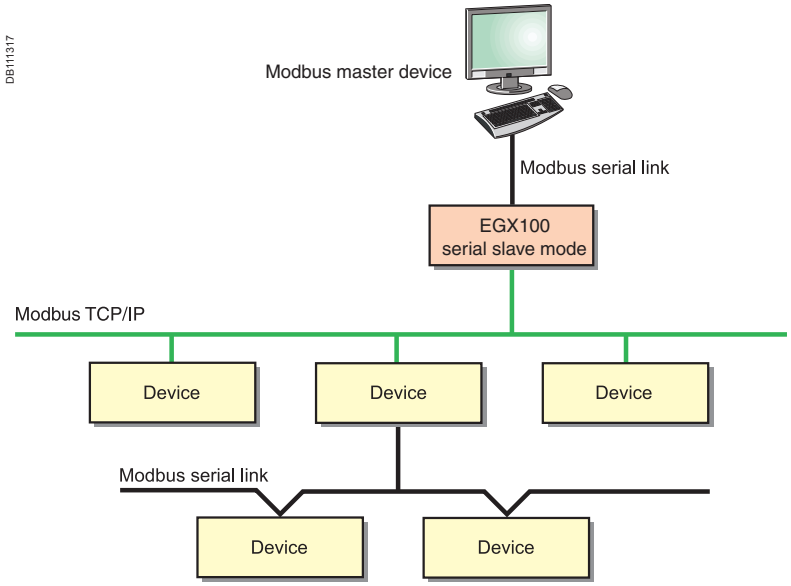
In all architectures, the communication interface serves as the link between the installation devices and the PC running the operating software. It provides the physical link and protocol adaptation. Adaptation is required because the communication systems used by the PC (Modbus via RS232 and/or Ethernet)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

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



Modbus communication architecture.

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



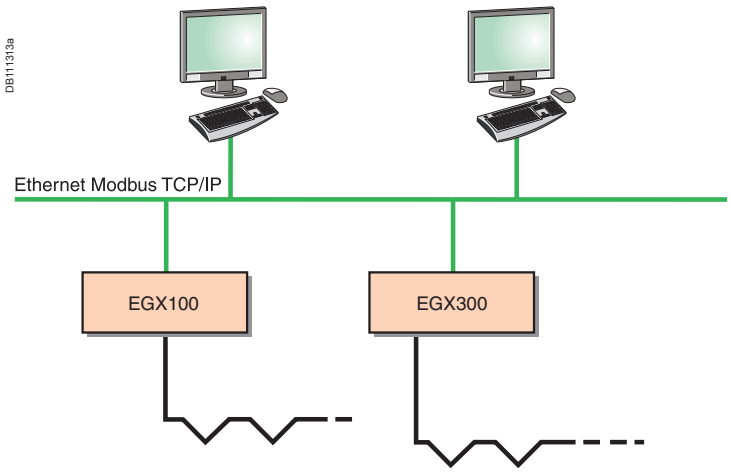
Modbus communication across Ethernet network

Communication interfaces and associated services (cont.)

Ethernet link

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

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



Ethernet communication architecture.

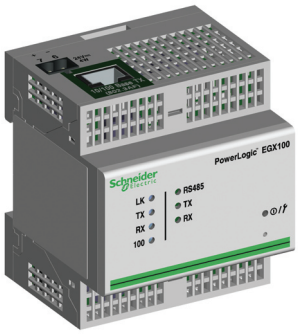
The services available with these technologies considerably simplify the creation, maintenance and operation of these supervision systems.

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

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

PowerLogic EGX100
Ethernet gateway

PE86138



PowerLogic EGX100

Function

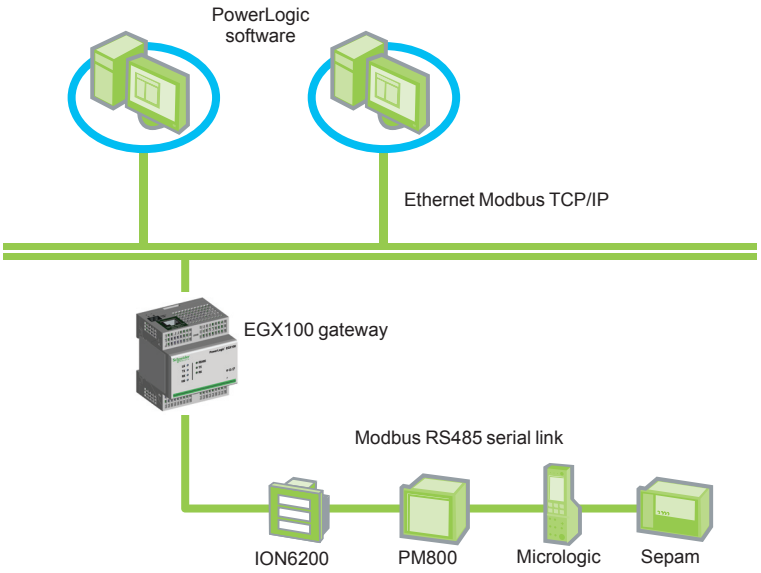
The EGX100 serves as an Ethernet gateway for PowerLogic system devices and for any other communicating devices utilising the Modbus protocol. The EGX100 gateway offers complete access to status and measurement information provided by the connected devices via PowerLogic software installed on a PC.

PowerLogic software compatibility

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

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

Architecture



Setup

Setup via an Ethernet network

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

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

Setup via a serial connection

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

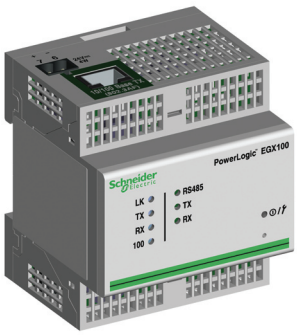
- specifies the IP address, subnet mask and gateway address of the EGX gateway
- specifies the language used for the setup session

Part numbers

Powerlogic EGX100	Schneider Electric	Square D
EGX100	**EGX100MG**	**EGX100SD**

PowerLogic EGX100
Ethernet gateway (cont.)

PE86138



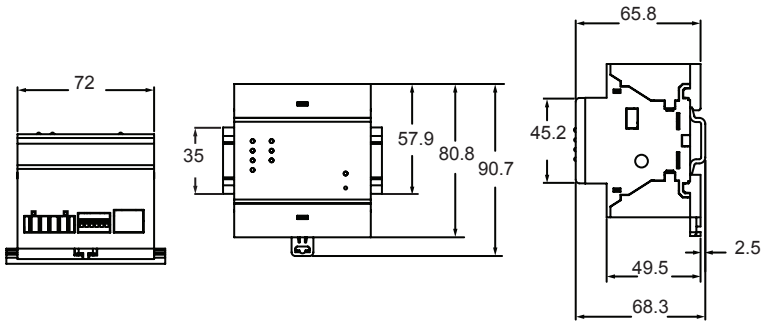
PowerLogic EGX100

Characteristics

	EGX100
Weight	170g
Dimensions (HxWxD)	80.8 x 72 x 65.8 mm
Mounting	Din rail
Power-over-Ethernet (PoE)	Class 3
Power supply	24 Vdc 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)

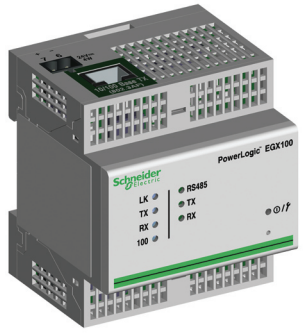
Installation

Din rail mounting



PowerLogic EGX300
Integrated gateway-server

PE86181



PowerLogic EGX300

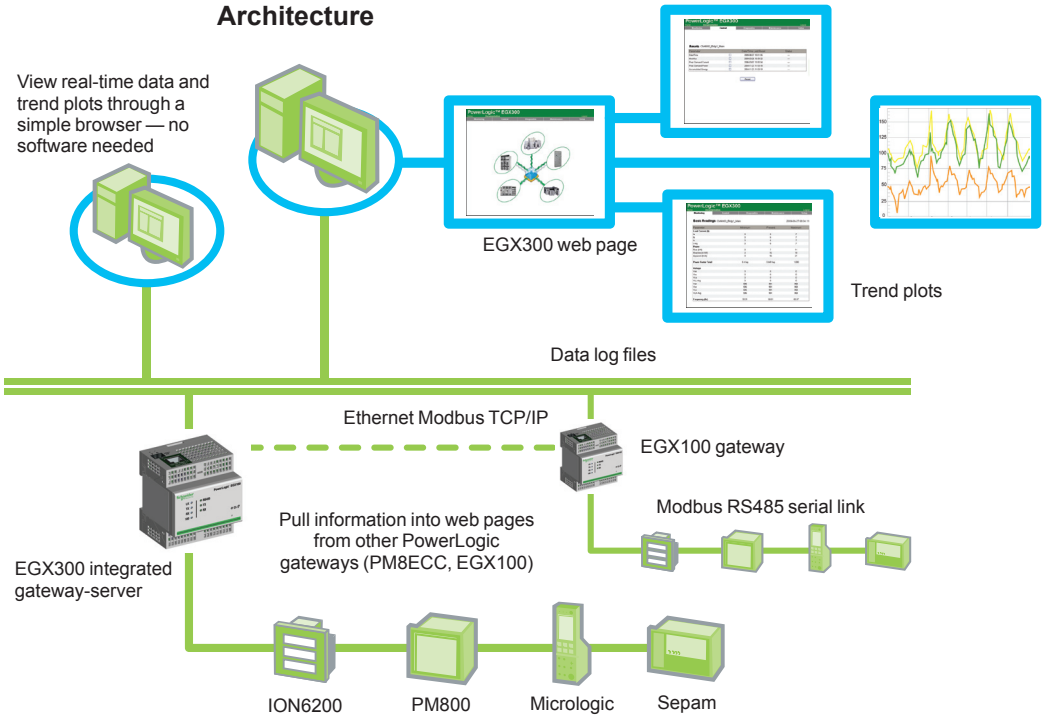
Function

The EGX300 is an Ethernet-based device providing a simple transparent interface between Ethernet-based networks and field devices. These include meter, monitors, protective relays, trip units, motor controls and other devices that communicate using ModbusTCP/IP, Modbud, JBUS, or PowerLogic protocol.

The EGX300 can form a simple, scalable web-based monitoring solution providing real-time data views, on-board data logging/trending, and simple control for field devices. The EGX300 helps provide a system solution that can upgrade to include monitoring software for more advanced data collection, trending, alarm/event management, analysis and other functions. The EGX300 is compatible with:

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

Architecture



Features

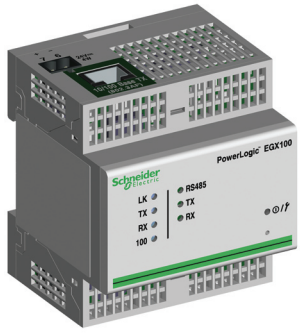
- View real-time and historical information and real-time trending from multiple locations via any standard web browser
- Automatically detect attached Modbus serial devices for easy setup
- Automatically email, FTP, or HTTP selected logged data to your PC for additional analysis
- Select the logging intervals and topics you want logged
- Ensures data and system security through password protection and controlled network access to individual/custom web pages
- Simplifies installation by receiving control power through the Ethernet cable utilising Power-over-Ethernet and offers the option to utilise 24 Vdc control power
- Perform simple control reset commands for supported devices (e.g. min/max, accumulated energy, etc.)
- Log equipment maintenance activities via the EGX web interface

Part numbers

Powerlogic EGX300	Schneider Electric	Square D
EGX300	**EGX300**	**EGX300SD**

PowerLogic EGX300
Integrated gateway-server (cont.)

PE86181



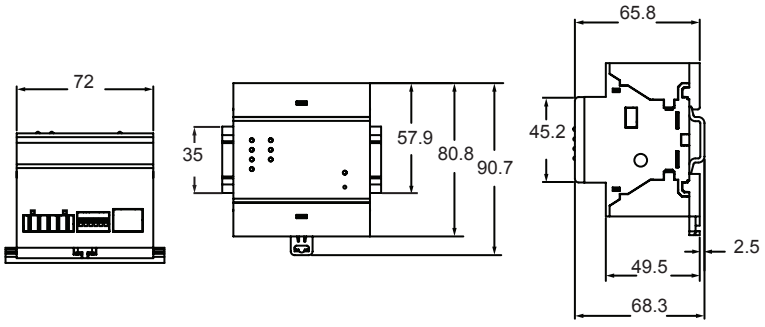
PowerLogic EGX300

Characteristics

	EGX300
Weight	170g
Dimensions (HxWxD)	80.8 x 72 x 65.8 mm
Mounting	Din rail
Power-over-Ethernet (PoE)	Class 3
Power supply	24 Vdc 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/NZS 60950
Serial ports	
Number of ports	1
Types of ports	RS232 or RS485 (2-wire or 4-wire), depending on settings
Protocol	Modbus RTU/ASCII, PowerLogic (SY/MAX), Jbus
Maximum baud rate	38400 or 57600 baud depending on settings
Maximum number of connected devices	32 (directly) 64 (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), BootP
Web server	
Memory for logging, custom web pages and documentation	512 Mb

Installation

Din rail mounting



ION7550 RTU
Functions and characteristics

PE86117

PowerLogic ION 7550RTU.

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

Applications

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

Main characteristics

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

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

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

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

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

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

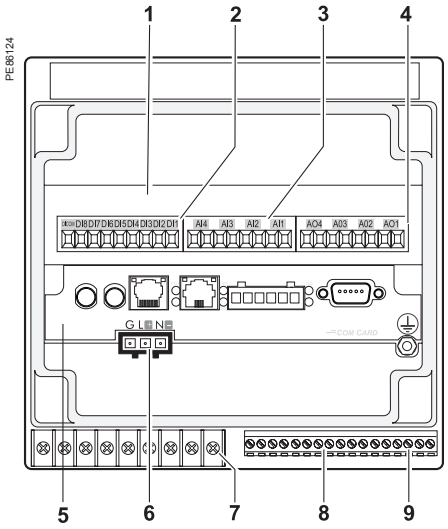
Notify alarms via email
High-priority alarms sent directly to the user's PC. Instant notification of power quality events by email.

Part numbers

ION7550RTU	
ION7550	**M7550**

See page 139 for order code explanations.

ION7550 RTU
Functions and characteristics (cont.)



PowerLogic® ION7550RTU.

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

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

ION7550 RTU
Functions and characteristics (cont.)

PE86117

PowerLogic ION7550RTU.

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

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

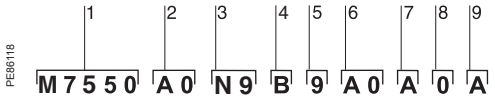
ION7550 RTU
Functions and characteristics (cont.)

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, 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.)

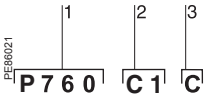


Sample ION7550RTU part number.

Part numbers

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

ION7550 RTU
Functions and characteristics (cont.)



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

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

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

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

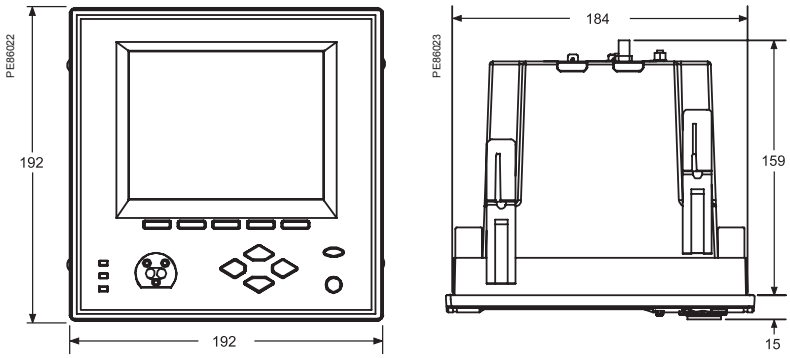
OpenDAC rack, controllers, power supply	
70LRCK16-48	OpenDAC rack. Holds up to 8 OpenLine modules to provide up to 16 I/O points. Requires communications controller
72-MOD-4000	OpenDAC OpenDAC RS-485 serial module. Communications controller for use in a Modbus RTU network. Supports up to 2 70LRCK16-48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

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

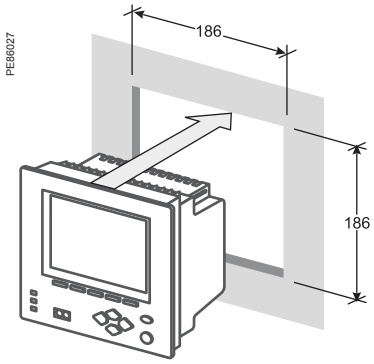
OpenLine analog I/O modules	
73L-II020	analog input, current, 0-20mA
73L-II420	analog input, current, 4-20mA
73L-ITCJ	analog input, temperature, J-type TC
73L-ITCK	analog input, temperature, K-type TC
73L-ITCT	analog input, temperature, T-type TC
73L-ITR100	analog input, temperature, RTD
73L-ITR3100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

ION7550 RTU
Installation and connection

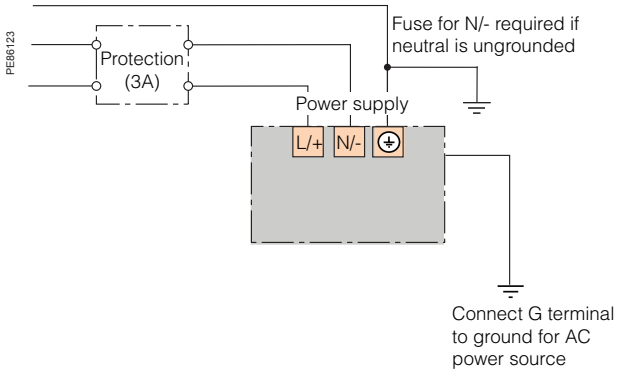
ION7550RTU dimensions



Front-panel mounting



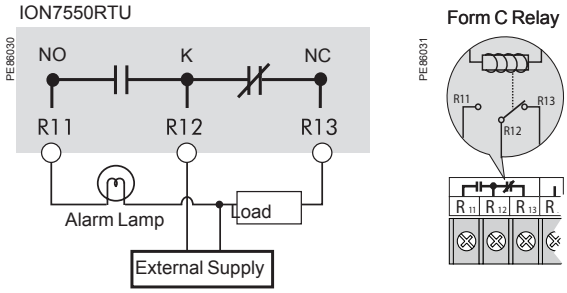
Power supply



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

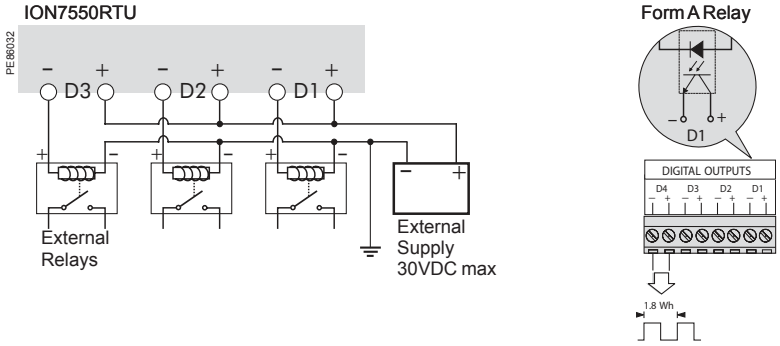
ION7550 RTU
Installation and connection (cont.)

Form C digital outputs: mechanical relays R1 - R3



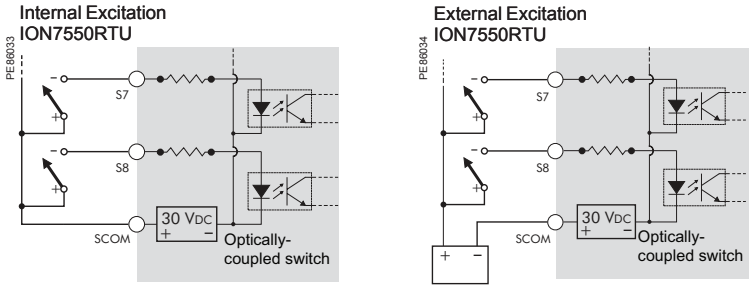
Note: Mechanical relays should always be protected by external fuses

Form A digital outputs: solid state relays D1 - D4



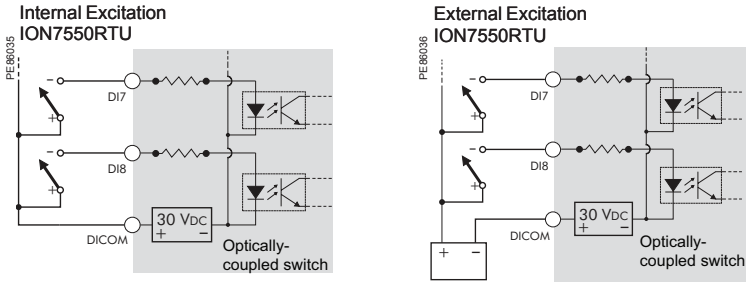
Note: D4 output is factory-configured to pulse once every 1.8 Wh for Class 20 meters, or once every 0.18Wh for Class 2 meters (for calibration testing purposes).

Digital inputs: S1 - S8



Note: External Supply = 130 VDC max

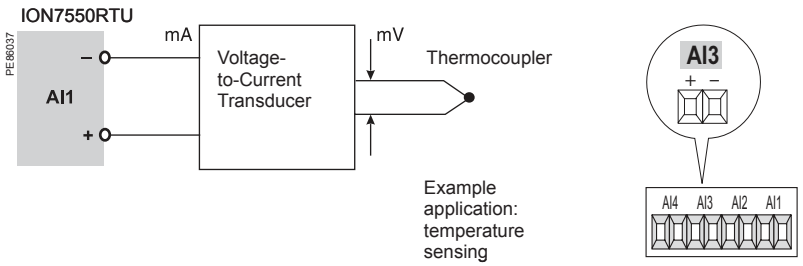
Digital inputs: DI1 - DI8 (option)



Note: External Supply = 50 VDC max

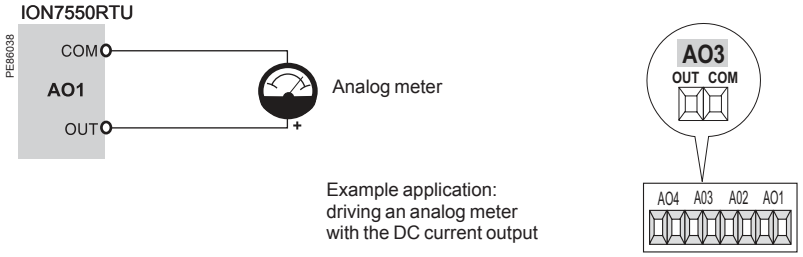
ION7550 RTU
Installation and connection (cont.)

Analog inputs: AI1 to AI4 (option)



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

Analog outputs: AO1 to AO4 (option)



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

Software introduction and comparison

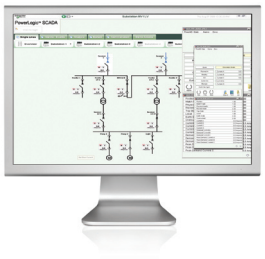
PE86230

PowerLogic PowerView
power monitoring software

PE86202

PowerLogic ION Enterprise
power management software

PE86231



PowerLogic SCADA
power monitoring and control software

A choice of powerful, effective solutions

PowerLogic 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.

□ **PowerLogic PowerView** software is a cost-effective, easy-to-use, entry-range power monitoring solution ideal for small system applications.

□ **PowerLogic ION Enterprise** 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.

□ **PowerLogic SCADA** 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

PowerLogic 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
PowerLogic PowerView	■	■				■	■	
PowerLogic ION Enterprise	■	■	■	■	■	■■■	■■■■	■
PowerLogic SCADA	■		■	■	■		■■	■■■■

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

Software introduction and comparison (cont.)

Applications for industry, buildings, data centres and infrastructure

Category		Application	PowerLogic PowerView	PowerLogic ION Enterprise	PowerLogic SCADA
	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	PowerLogic ION Enterprise	PowerLogic SCADA
	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.*

PowerView

PE86106-c

PowerLogic™ PowerView™.

PowerLogic™ PowerView™ v2.01 is an easy-to-use, entry-range power monitoring solution ideally suited for small system applications. The software polls the network for compatible PowerLogic devices, simplifying system and device configuration. Connection and data logging begins automatically at factory preset intervals, settings which are easily changed by the user. PowerView allows users to track real-time power conditions and perform remote monitoring of electrical equipment or installations at key distribution points across an electrical network.

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

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

See page 150 for details of actual parameters logged.

Applications

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

Functions

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

Part numbers

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

(1) These are the internal part numbers Schneider Electric country organizations should use when ordering PowerView.Note: PowerView is sold only to country organizations

PowerView (cont.)

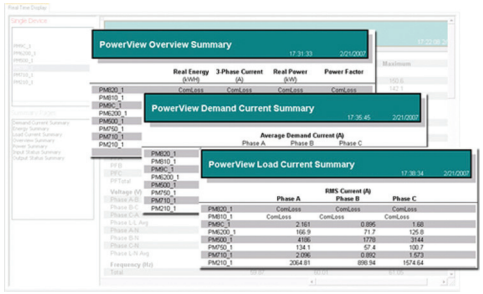
PE86192-c

Automatically detect and add up to 32 compatible PowerLogic devices.

Automatic device acquisition and data integration

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

PE86109-c



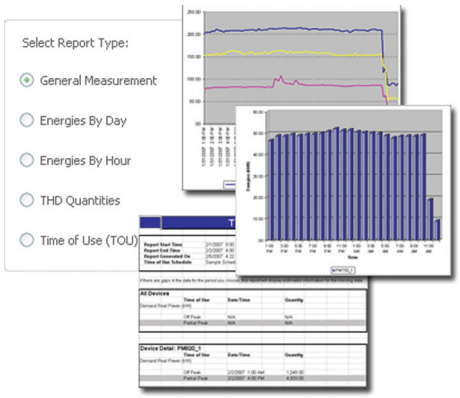
Desktop access to power system information from any department, building or region. Graphical views of relevant, actionable information.

Real-time monitoring

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

PowerView (cont.)

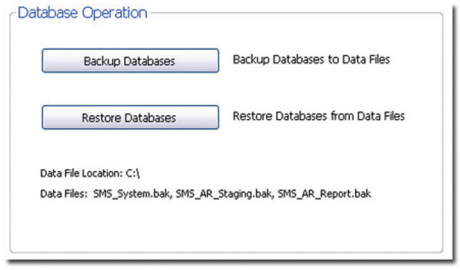
PE86110-c



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

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

PE86111-c



PowerView includes robust Microsoft SQL2005 Express-Advanced database management.

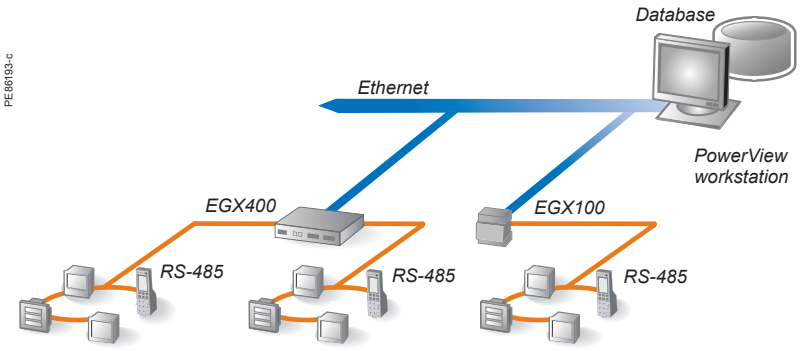
Database management
■ Microsoft SQL2005 Express-Advanced database management includes:
■ Database backups
■ Database restores
■ Historical database management
■ Maintained below 2.9GB in size.

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

Microsoft Windows operating systems supported
■ MS Windows 2000 Workstation Edition SP4.
■ MS Windows XP Professional Edition SP2.
■ MS Vista.

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

PowerView (cont.)



Compatible meters and trip units

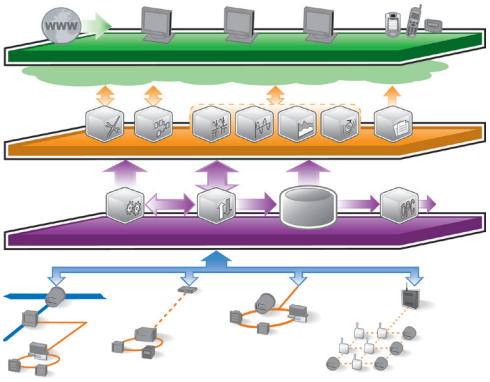
Parameters	PM9C	PM200	Micrologic A, P, H	PM500	ION6200	PM750 PM710	PM800 series	Enercept	Compact NSX
Phase current (A, B, C)	■	■	■	■	■	■	■	■	■
Phase voltage (AN, BN, CN)	■	■	■	■	■	■	■	■	■
Line voltage (AB, BC, CA)	■	■	■	■	■	■	■	■	■
Power factor total	■	■	■	■	■	■	■	■	■
Real energy (kWh)	■	■	■	■		■	■	■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

PowerLogic ION Enterprise™
Functions and characteristics

PE86095

PowerLogic ION Enterprise™

PE86097



Functional components of ION Enterprise.

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

Typical applications

PowerLogic ION Enterprise software has many applications:

- Reduce peak demand surcharges and power factor penalties
- Enable participation in load curtailment programs (e.g. demand response)
- Verify that power quality complies with the energy contract
- Verify the reliable operation of equipment
- Improve response to power quality-related problems
- Leverage existing infrastructure capacity 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

Scalable, flexible architecture

- Grow to hundreds of metering points
- Add distributed servers and clients
- Use modular programming for complex processing and control
- Integrate legacy and third-party devices
- Leverage and optimise existing infrastructure

Functional components

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

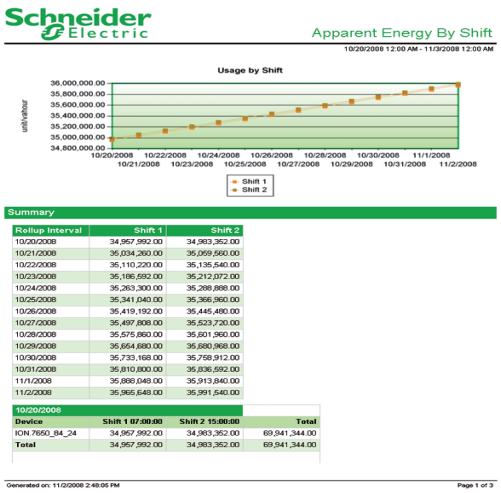
- Management Console
  - Use this component to configure your PowerLogic ION Enterprise network, including communication paths, devices and logical groups
- Designer
  - Designer allows you to customise the modular functionality of your ION devices and Virtual Processors
- Vista
  - Offers real-time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

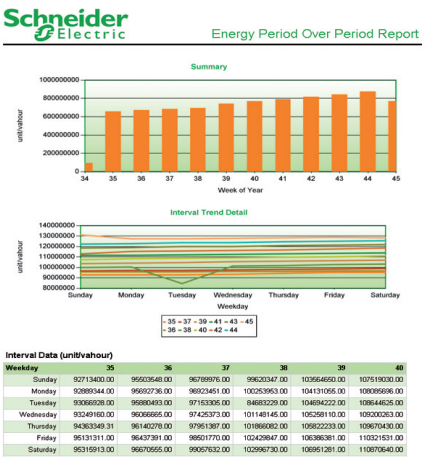
Data acquisition and management

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

PowerLogic ION Enterprise™
Functions and characteristics (cont.)

PE86211





Web Reporter allows users to create and customise a wide variety of reports, such as period or shift comparisons and trends, by building, process, or region.

Scalable, flexible architecture (cont.)

Reporting

The powerful, intuitive Web Reporter module lets users see critical information exactly how, where, and when they need it.

Reports can be generated manually, on schedule or event-driven. Distribute automatically as email or HTML. .

- Preconfigured or fully customised
- Support MS Excel and other third-party reporting tools
- Manual, scheduled, or alarm/event-triggered distribution via email or web
- Reports accessible via a web browser
- Support WAGES (Water, Air, Gas, Electricity, Steam) measurements
- Per User Security Model (View, Edit, Create, and Delete)
- Can be generated in PDF format
- Can export data in XML format
- Support remote report development and uploading

Includes:

- Energy Cost Report
- Load Profile Report
- Power Quality Report
- IEC 61000-4-30 and EN50160 compliance reports
- Energy Period over Period Comparison (compare energy consumption of different periods)
- Energy by Shift Report (compare energy over different user-defined shifts)
- Trending Report (trend multiple measurements for one device or one measurement for multiple devices over time)
- Tabular Report (show logged measurements and associated time in a raw tabular format)
- Alarm & Event Report (show events / alarms from specific devices based on priority level)
- 100 Millisecond Report (show Power Quality millisecond time-stamped data from devices supporting millisecond logging of PQ measurements
- System Configuration Report (get a quick inventory of your system – Device Name, Group, Connection, and Device Address)

PowerLogic ION Enterprise™
Functions and characteristics (cont.)

PE86098

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

Functions

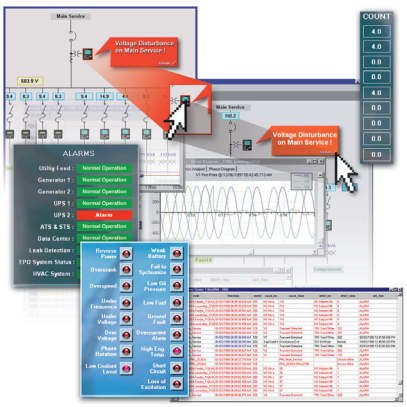
PowerLogic ION Enterprise offers a wide range of functions:

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

Data acquisition and integration

Integrate WAGES (water, air, gas, electricity, steam) metering. Native, out-of-the-box support for all PowerLogic ION series, PowerLogic PM800 series, PM750, PM710 and PM210 power and energy meters, PowerLogic CM3250, CM3350, CM4000, CM4250, CM4000T, circuit monitors, Micrologic Compact NSX Type A and Type E breakers, MicroLogic A, P and H circuit breaker control units, the PowerLogic BCPM, branch circuit power meter and the Sepam series 10, 20, 40 and 80 protective relays. Also supports legacy ACM series meters. Enables access to meter data, control of on-board relays and digital outputs, remote configuration and firmware upgrading. Interface with third-party meters, transducers, PLCs, RTUs and power distribution or mitigation equipment. 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.

PE86099



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

Alarms and events

PowerLogic ION Enterprise software allows you to receive alerts to outages or impending problems that could lead to equipment stress, failures, or downtime.

- Trigger on complex conditions
- Generate & distribute alarm notifications
- Log all relevant data sequence of events for diagnosis
- Flag & avert potential problems
- Alert key personnel 24/7
- Optimise maintenance scheduling

PE86125

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

Manual and automated control

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

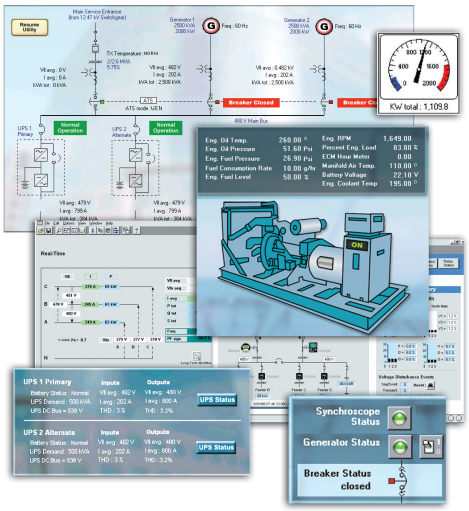
- Perform manual or setpoint-triggered functions
- Coordinate control of multiple loads, generators, relays, etc.
- Support energy-saving applications
- Manage distributed energy assets
- Automate substations & reduce service time

Web portal

- Allow multi-user access
- Use multi-level security checks

PowerLogic ION Enterprise™
Functions and characteristics (cont.)

PE86101

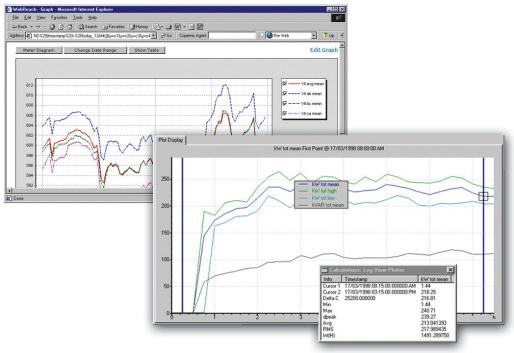


Desktop access to power system information from any department, building or region. Graphical views of relevant, actionable information customised for each user.

Real-time monitoring
View, from any local or globally located workstation, key distribution points across one or more facilities or substations.

- Collect system-wide data
- Perform calculations, display and log derived data
- Customise views of data – digital figures, dials, bar or trend graphs, one-line diagrams, etc.
- Communicate over Internet, Ethernet, wireless

PE86102



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

Trend analysis
Trend any parameter to reveal demand peaks and track system-wide energy costs.

- Graph any combination of measured parameters
- Aggregate loads
- Identify dangerous trends and redistribute loads
- Optimise network capacity and avoid over-building
- Avoid peak demand surcharges and power factor penalties

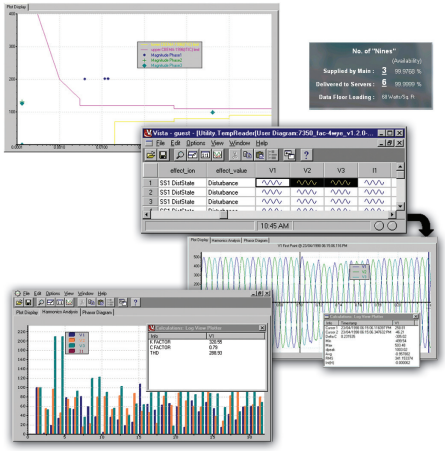
PE86103

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

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

PowerLogic ION Enterprise™
Functions and characteristics (cont.)

PE86104



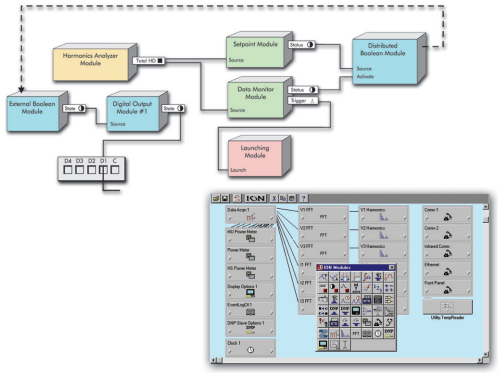
Minimise equipment damage and downtime by pinpointing the source of disturbances, verifying the effect of system upgrades, and validating compliance with power quality standards.

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

PowerLogic ION Enterprise supports a wide range of applications:
- Monitor events and waveform plotting system-wide
- Monitor harmonics, K-factor, crest factor, symmetrical components
- Diagnose and isolate PQ problems to increase reliability
- Benchmark performance and compare service areas
- Track contracted service compliance

Patented ION technology
PowerLogic ION Enterprise 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.

PE86105



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

Part numbers*

New systems and add-ons	**IE60-BASE-ENG**	PowerLogic ION Enterprise base software (English, DVD)
	IE60-DL-S *(1)*	Individual Device Licence for High-End Devices, compatible with all supported device types
	IE60-DL-M *(1)*	Individual Device Licence for Mid-Range Devices, compatible with all supported device types
	IE60-DL-E *(1)*	Individual Device Licence for Entry-Range Devices, compatible with Entry-Range devices
	IE60-CL *(2)*	PowerLogic ION Enterprise Client Licence
Options	**IONE-SQL-2005**	Integrated SQL Server 2005 Standard Edition (for use with ION Enterprise only) – Processor Licence for 1 CPU
	IONE-SQL-2005-CPU	Additional CPU Licence for Integrated SQL Server 2005
	IONE-OPC-V1	OPC DA Server for ION Enterprise
	IONE-PQDIF-V1	PQDIF Exporter for ION Enterprise
Upgrades from ION Enterprise 5.5/5.6	**IE60-BASE-ENG-UPG**	PowerLogic ION Enterprise base software (English, DVD) - upgrade from v5.5 SP2 or later
	IE60-DL-S-UPG	Individual Device Licence Upgrade for High-End Devices, compatible with all supported device types
	IE60-DL-M-UPG	Individual Device Licence Upgrade for Mid-Range Devices, compatible Mid- and Entry-Range devices
	IE60-DL-E-UPG	Individual Device Licence Upgrade for Entry-Range Devices, compatible with Entry-Range devices
	IE60-CL-UPG	PowerLogic ION Enterprise Client Licence - upgrade
PowerLogic ION Enterprise documentation	**CD-TECHDOC**	Compact disc containing the latest version of technical documentation

(1) *An appropriate device licence (IE60-DL-S, DL-M, or DL-E) is required for each meter or device connected to your PowerLogic ION Enterprise system. Device licences have a minimum order quantity of ten (10).*
(2) *A client licence is required for each workstation that is used to connect to your primary PowerLogic ION Enterprise server.*
** Please refer to Schneider Electric sales representative for full pricing and part numbers information.*

PowerLogic ION Enterprise™
Functions and characteristics (cont.)

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

Minimum system requirements
Please consult your local Schneider Electric representative for complete system requirements and commissioning information for PowerLogic ION Enterprise. The following are minimum requirements to support 1 to 25 meters with factory default settings.
■ *Server hardware:* CPU requirements are dependent on number of devices and clients to be supported; recommended is 2+ GHz Dual Core or Dual CPU, 4 GB RAM, 60 GB disk drive DVD drive
■ *Server software:* The Primary Server computer should be Windows Server 2003 or 2008 certified, as per the hardware compatibility list on the Microsoft website. Windows XP Professional SP3 or Windows Vista may be used for standalone Primary Server applications using 1-25 networked devices, and no ION Enterprise client computers. Server must have a CD-ROM drive, Ethernet communications port and other standard hardware.
■ *Secondary server:* Hardware and software requirements vary according to application needs. Contact Technical Support for assistance.
■ *Database server:* PowerLogic ION Enterprise can install SQL Server 2005 Express on the Primary Server and automatically set up the databases on that computer. Note: SQL Server 2005 Express has database size limitations. Databases over 4 GB require SQL Server 2005 Standard Edition on the Primary Server, or on a separate server optimised for disk capacity and performance. SQL Server 2000 and MSDE are not supported. (Note: SQL Server 2000 and MSDE are not MS Windows Vista compatible).

Supported devices

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

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

PowerLogic branch circuit power meters:
■ BCPM

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

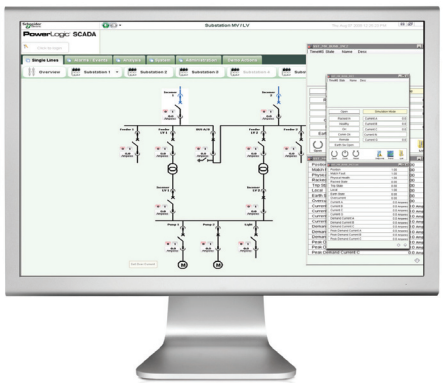
Protective relays
■ Sepam series 10, 20, 40, 80

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

Other
■ Modbus-compatible devices
■ Other devices through OPC

SCADA 7.1 SR1
Functions and characteristics

PE86177



PowerLogic™ SCADA 7.1.

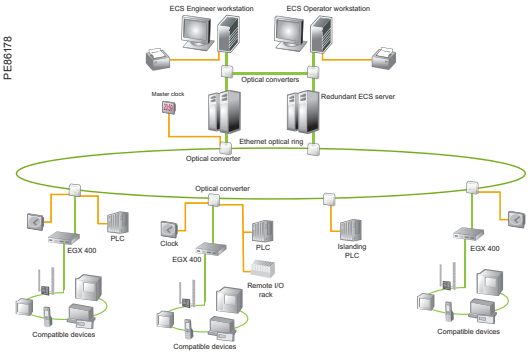
PowerLogic SCADA v 7.1 SR1 is a reliable, flexible and high performance monitoring and control solution designed to reduce outages and increase power efficiency. It is built to handle user requirements from the smallest to the most demanding enterprises, while still providing high time performance and 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. PowerLogic SCADA 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

PowerLogic SCADA 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 PowerLogic SCADA.

System architecture

Human machine interface (HMI)

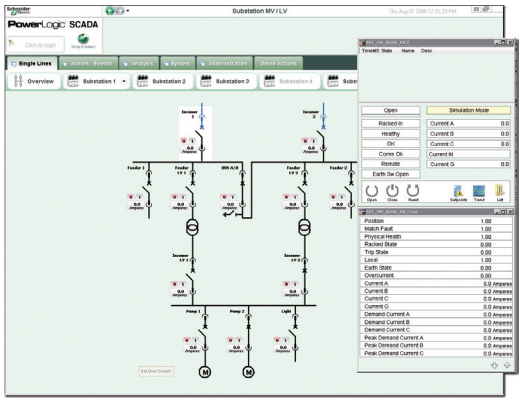
PowerLogic SCADA offers secure, operator-dedicated, multi-user data and control access through a local server interface, full control client and also through web clients.

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.

SCADA 7.1 SR1
Functions and Characteristics (cont.)

PE86184



Connect to switches, IEDs, RTUs, control and monitoring devices. Extract values for dynamic power and energy readings.

Functions

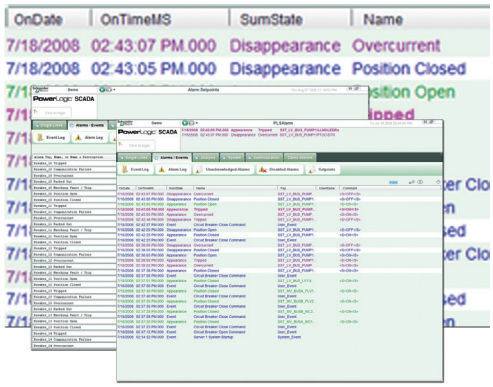
PowerLogic SCADA offers a wide range of functions:

- 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 - Service Release 2 required), Micrologic 5.0P and 6.0P, Micrologic A, Micrologic A FW v2, PowerLogic CM4000 series, PM800 series, PM710, PM750, ION7650 (modbus only) 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.

PE86182



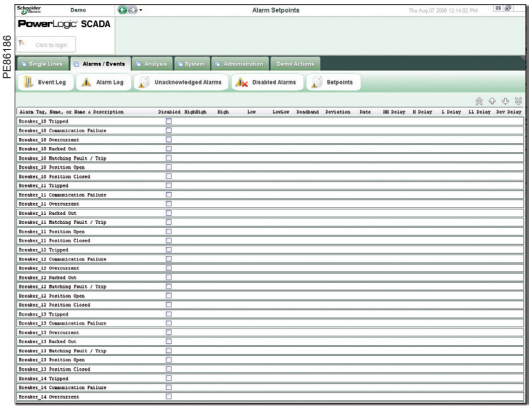
View all alarm conditions at a glance.

Alarms and events

PowerLogic SCADA 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.

PE86186



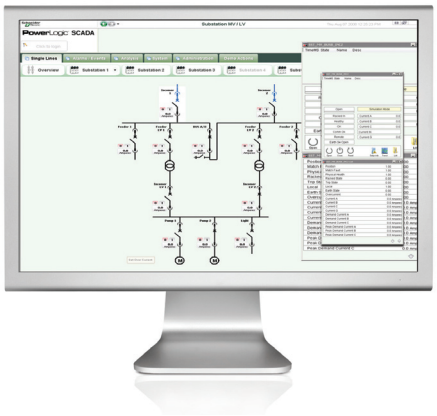
Control loads, generation, and power quality mitigation equipment across your enterprise or service area. Optimise switching with the latest status and base loading data.

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.

SCADA 7.1 SR1
Functions and Characteristics (cont.)

PE86180

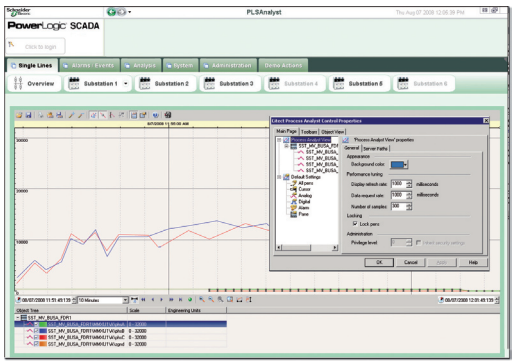


Desktop access to power system information from any department, building or of relevant, realtime data.

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.

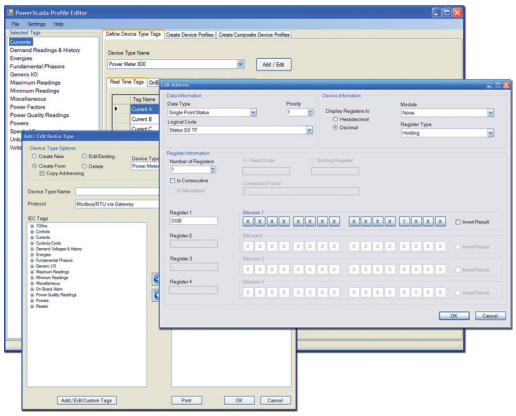
PE86188



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. Record, save or export trends to archives.

PE86189



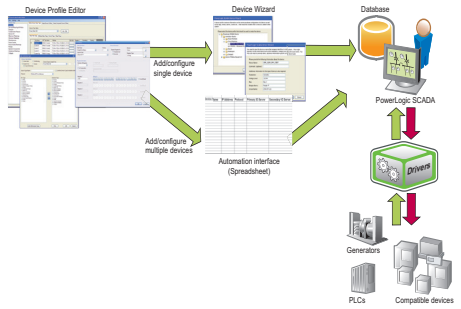
Use the Profile Editor and Profile Wizard to design and configure your network. Customise device profiles specific to your project.

Configuration tools
PowerLogic SCADA 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.
  - 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.

SCADA 7.1 SR1
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 PowerLogic SCADA. 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

PE86191

Supported devices

PowerLogic electrical network protection:

- ■ Sepam series 20, 40, 80, SEPAM 2000 (S36 - Service Release 2 required)

PowerLogic power and energy meters:

- ■ PM800 series
- ■ PM710, PM750
- ■ CM4000 series
- ■ ION 7650 (modbus only)

Circuit breaker control units

- ■ Micrologic 5.0P
- ■ Micrologic 6.0P
- ■ Micrologic A, and Micrologic A FW v2

Branch circuit monitors:

- ■ BCPM
- ■ BCM42

Other:

- ■ Any PLC or other device via Modbus protocol

SCADA 7.1 SR1
Functions and Characteristics (cont.)

Part Numbers		
Description		
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 license)	**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 license)	**PLS102288**
View Only Client Licenses		
View-Only Client Licence	Independent of points	**PLS103099**
	Redundant (floating license)	**PLS103088**
Web View Only Client Licences		
Web View only Client Licence	Independent of points	**PLS103299**
	Redundant (floating license)	**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**

SCADA 7.1 SR1
Functions and Characteristics (cont.)

Part Numbers	
Description	
Key Reprogramming	
Reprogramming fee[1]	**PLS109101**
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**
Subscription 1 year support renewal	**PLS109139**
Subscription reinstatement	**PLS109140**
Gold support reinstatement	**PLS109141**

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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RCS Nanterre 954 503 439
Capital social 896 313 776 €

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