

Advanced metering applications

Advanced high performance meters are designed for mains or critical loads on MV/LV networks. They provide analysis of efficiency, losses and capacity, bill verification, power quality compliance monitoring, problem notification and diagnosis and control of loads, etc.

Advanced metering

Power quality meters are classified as advanced meters designed to monitor service entrances and critical network locations to maximise power availability and reliability by providing a comprehensive system load profile, power quality and root cause analyses.

- PowerLogic PM8000
- PowerLogic ION7550/7650



PB113687

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PM8000 Series

The PowerLogic PM8000 series meters are compact, cost-effective multifunction power meters that will help you ensure reliability and efficiency of your power-critical facility.

Reveal and understand complex power quality conditions. Measure, understand and act on insightful data gathered from your entire power system. Designed for key metering points throughout your energy infrastructure, the PowerLogic PM8000 series meter has the versatility to perform nearly any job you need a meter to do, wherever you need it!

Applications

Ideal for low to high voltage applications in industrial facilities, commercial buildings, utility networks, or critical power environments.

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The solution for

Markets that can benefit from a solution that includes PowerLogic PM8000 series meters:

- Healthcare
- Data centres
- Buildings
- Industry
- Infrastructure

Benefits

- Makes understanding power quality simple to help operations personnel avoid downtime and ensure increased productivity and equipment life.
- Makes energy and power quality immediately relevant and actionable to support your operational and sustainability goals.

Competitive advantages

- ION technology
- Disturbance direction detection, modularity and compliance with latest power quality standards
- Colour screen
- Multiple communication options

Power management solutions

Schneider Electric provides innovative power management solutions to increase your energy efficiency and cost savings, maximise electrical network reliability and availability, and optimise electrical asset performance.

Conformity of standards

- IEC 61557-12
- IEC 61000-4-2
- IEC 62586
- IEC 61000-4-3
- IEC 62053-22
- IEC 61000-4-4
- IEC 62053-24
- IEC 61000-4-5
- EN 50470-1
- IEC 61000-4-6
- EN 50470-3
- IEC 61000-4-8
- IEC 61000-4-30
- IEC 61010
- EN 50160
- Etc.
- IEC 62053-11



PowerLogic PM8000 series meter.



PowerLogic PM8000 series meter - rear view.



PowerLogic PM8000 DIN rail mounted meter.

Main characteristics

- Precision metering:
 - IEC 61557-12 PMD/Sx/K70/0.2 3000m (performance measuring and monitoring functions)
 - Class 0.2S accuracy IEC 62053-22, ANSI C12.20 Class 0.2 (active energy)
 - Industry leading Class 0.5S accuracy for reactive energy (IEC 62053-24)
 - Cycle-by-cycle RMS measurements updated every ½ cycle
 - Full 'multi-utility' WAGES metering support
 - Net metering
 - Anti-tamper protection seals

- PQ compliance reporting and basic PQ analysis.
 - Monitors and logs parameters in support of international PQ standards,
 - IEC 61000-4-30 Class S
 - IEC 62586 PQI-S
 - EN 50160
 - Generates onboard PQ compliance reports accessible via onboard web pages:
 - Basic event summary and pass/fail reports, such as EN 50160 for power frequency, supply voltage magnitude, supply voltage dips, short and long interruptions, temporary over voltages, voltage unbalance and harmonic voltage
 - ITIC (CBEMA) and SEMI curves, with alarm categorisation to support further analyses
 - NEMA Motor Derating curve
 - Basic meter provides EN 50160 but can be configured to provide IEEE 519
 - Harmonic analysis:
 - THD on voltage and current, per phase, min/max, custom alarming
 - Individual harmonic magnitudes and angles on voltage and current, up to the 63rd harmonic
 - High resolution waveform capture: triggered manually or by alarm, captured waveforms available directly from the meter via FTP in a COMTRADE format
 - Disturbance detection and capture: sag/swell on any current and voltage channel, alarm on disturbance event, waveform capture with per-event information
 - Patented disturbance direction detection: provides indication of the captured disturbance occurring upstream or downstream of the meter; timestamped results provided in the event log, with degree of certainty of disturbance direction

- Used with Schneider Electric's sophisticated software tools, provides detailed PQ reporting across entire network:
 - EN 50160 report
 - IEC 61000-4-30 report
 - PQ compliance summary
 - Display of waveforms and PQ data from all connected meters
 - Onboard data and event logging
 - 512 MB of standard non-volatile memory



PowerLogic PM8000 series meter with remote display.



PowerLogic I/O module.

- Onboard data and event logging
 - No data gaps due to network outages or server downtime.
 - Min/Max log for standard values.
 - 50 user-definable data logs, recording up to 16 parameters on a cycle-by-cycle or other user definable interval.
 - Continuous logging or 'snapshot' triggered by setpoint and stopped after defined duration.
 - Trend energy, demand and other measured parameters.
 - Forecasting via web pages: average, minimum and maximum for the next four hours and next four days.
 - Time-of-use in conjunction with Schneider Electric software.
 - Event log: alarm conditions, metering configuration changes, and power outages, timestamped to 1 millisecond.
- Alarming and control
 - 50+ definable alarms to log critical event data, trigger waveform recording, or perform control function.
 - Trigger on any condition, with cycle-by-cycle and 1-second response time.
 - Combine alarms using Boolean logic and to create alarm levels.
 - Alarm notification via email text message.
 - In conjunction with Schneider Electric's software, alarms and software alarms and alarm frequency are categorized and trended for easy evaluation of worsening/improving conditions.
 - Excellent quality: ISO 9001 and ISO 14000 certified manufacturing.

Usability

- Easy installation and setup.
 - Panel and DIN rail mounting options, remote display option.
 - Pluggable connectors.
 - Free setup application simplifies meter configuration.
- Front panel.
 - Easy to read colour graphic display.
 - Simple, intuitive menu navigation with multi-language (8) support.
- Flexible remote communications.
 - Multiple simultaneously operating communication ports and protocols allow interfacing with other automation systems; (e.g. waveforms, alarms, billing data, etc.) can be uploaded for viewing/analysis while other systems access real-time information.
 - Supports Modbus, ION, DNP3, IEC 61850.
 - Dual port Ethernet: 10/100Base-TX; daisy-chaining capability removes need for additional switches.
 - Create redundant network loop using Rapid Spanning Tree Protocol (RSTP) and managed Ethernet switches.
 - Customise TCP/IP port numbers enable/disable individual ports.
 - RS-485 2-wire connection, up to 115200 baud, Modbus RTU and ION protocols, DNP3 is also supported via RS-485.
 - Ethernet to serial gateway with Modbus Master functionality, connecting to 31 downstream serial Modbus devices. Also supports Modbus Mastering over TCP/IP (Ethernet) network.
 - Full function web server with factory and customisable pages to access real-time and PQ compliance data.
 - Push historical data via email.
 - Advanced security: Up to 16 configurable user accounts.

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PowerLogic PM8000 series meter with I/O modules.

- Time synchronisation via:
 - GPS clock (RS-485) or IRIG-B (digital input) to +/- 1 millisecond.
- Also supports Network Time Protocol (NTP/SNTP) and time set function from Schneider Electric software server.

Adaptability

- ION™ frameworks allow customisable, scalable applications, object-oriented programming, compartmentalises functions, and increases flexibility and adaptability.
- Applications include: access and aggregate data from Modbus devices on serial port or across the network (Modbus TCP/IP), logging and/or processing data by totaling, unit conversion or other calculations, applying complex logic for alarming or control operations, data visualisation via web pages.

Standard meter I/O

- 3 digital status/counter inputs.
- 1 KY (form A) energy pulse output for interfacing with other systems.

Modular I/O options

- Optional expansion modules
- up to 2 modules per panel mounted meter
- up to 4 modules per DIN-rail mounted meter

Option modules include:

- Digital module
 - 6 digital status/counter inputs.
 - 2 Form C relay outputs, 250 V, 8 A.
- Analogue module
 - 4 analogue inputs (4-20 mA; 0-30 V).
 - 2 analogue outputs (4-20 mA; 0-10 V) for interfacing with building management sensors and systems.

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Underside of PM8000 meter.

Feature selection	
Commercial reference number	Description
METSEPM8240	96x96 panel mount meter
METSEPM8243	DIN rail mount meter
METSEPM8244	DIN rail mount meter with remote display
METSEPM82401	MID approved panel mount meter
Accessories	Description
METSEPM89RD96	Remote display, 3 metre cable, mounting hardware for 30mm hole (nut & centering pin), mounting hardware for DIN96 cutout (92x92mm) adapter plate
METSEPM89M2600	Digital I/O module (6 digital inputs & 2 relay outputs)
METSEPM89M0024	Analogue I/O module (4 analogue inputs & 2 analogue outputs)
METSEPM8000SK	Terminal covers for utility sealing

Feature guide		PM8000
General		
Use on LV and MV systems		■
Current accuracy (5 A Nominal)		0.1 % reading
Voltage accuracy (57 V L-N/100 V L-L to 400 V L-N/690 V L-L)		0.1 % reading
Active energy accuracy		0.2 %
Number of samples/cycle or sample frequency		256
Instantaneous rms values		
Current, voltage, frequency		■
Active, reactive, apparent power	Total and per phase	■
Power factor	Total and per phase	■
Current measurement range (autoranging)		0.05 - 10 A
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 and web page	63
	Via StruxureWare software	127
Waveform capture		■
Detection of voltage swells and sags		■
Fast acquisition	1/2 cycle data	■
EN 50160 compliance checking		■
Customisable data outputs (using 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)		512
Display and I/O		
Front panel display		■
Wiring self-test		■
Pulse output		1
Digital or analogue inputs(max)		27 digital 16 analogue
Digital or analogue outputs (max, including pulse output)		1 digital 8 relay 8 analogue
Communication		
RS-485 port		1
Ethernet port		2
Serial port (Modbus, ION, DNP3)		■
Ethernet port (Modbus/TCR, ION TCR, DNP3 TCR, IEC 61850 (2))		■
Ethernet gateway		■
Alarm notification via email		■
HTTP web server		■
SNMP with custom MIB and traps for alarms		■
SMTP email		■
NTP time synchronisation		■
FTP file transfer		■

PM8000 series

Technical specifications

Electrical characteristics

Type of measurement	True rms to 256 samples per cycle	
Measurement accuracy	Current & voltage	Class 0.2 as per IEC 61557-12
	Active Power	Class 0.2 as per IEC 61557-12
	Power factor	Class 0.5 as per IEC 61557-12
	Frequency	Class 0.2 as per IEC 61557-12
	Active energy	Class 0.2S IEC 62053-22 Class 0.2 IEC 61557-12, ANSI C12.20 Class 0.2
	Reactive Energy	Class 0.5S IEC 62053-24*
	MID Directive	EN 50470-1, EN 50470-1, AnnexB & AnnexD (optional model)
Data update rate	1/2 cycle or 1 second	
Input-voltage characteristics	Specified accuracy voltage	57 V L-N/100 V L-L to 400 V L-N/690 V L-L
	Impedance	5 M Ω per phase
	Specified accuracy frequency - Frequency	42 to 69 Hz (50/60 Hz nominal)
	Limit range of operation - frequency	20 to 450 Hz
Input-current characteristics	Rated nominal current	1 A (0.2S), 5 A (0.2S) , 10 A (0.2 ANSI)
	Specified accuracy current range	Starting Current: 5 mA Accurate Range: 50 mA - 10 A
	Permissible overload	200 A rms for 0.5s, non-recurring
	Impedance	0.0003 Ω per phase
	Burden	0.024 VA at 10 A
Power supply	AC	90-415 V AC \pm 10 % (50/60 Hz \pm 10 %) 90-120 V AC +/- 10% (400 Hz)
	DC	110-415 V DC \pm 15 %
	Ride-through time	100 ms (6 cycles at 60 Hz) min., any condition 200 ms (12 cycles at 60 Hz) typ., 120 V AC 500 ms (30 cycles at 60 Hz) typ., 415 V AC
	Burden	Meter Only: 18 VA max at 415 V AC, 6W at 300 V DC Fully optioned meter: 36 VA max at 415 V AC, 17W at 300 V DC.
Input/outputs	Meter Base Only	3 form A digital inputs (30 V AC/60 V DC) 1 form A (KY) solid state digital output (30 V AC/60 V DC, 75 mA).
	Optional	Digital - 6 form A digital inputs (30 V AC / 60 V DC) wetted + 2 form C relay outputs (250 V AC, 8 A) Analogue - 4 analogue inputs (4-20 mA, 0-30 V DC) + 2 analogue outputs (4-20 mA, 0-10 V DC).

Mechanical characteristics

Weight	Integrated Display Model 0.581 kg DIN rail mounted Model 0.528 kg IO modules 0.140 kg Remote display 0.300 kg	
IP degree of protection	IP 54, UL type 12: Panel mount and Remote display, front. IP 30: Panel mount rear, DIN rail mount, I/O modules.	
Dimensions	Panel mount model	96 x 96 x 77.5 mm
	DIN model	90.5 x 90.5 x 90.8 mm
	Remote display	96 x 96 x 27 mm
	IO modules	90.5 x 90.5 x 22 mm

Environmental conditions

Operating temperature	-25 °C to 70 °C
Remote Display Unit	-25 °C to 60 °C
Storage temperature	-40 °C to 85 °C
Humidity rating	5 % to 95 % non-condensing
Installation category	III
Operating altitude (maximum)	3000 m above sea-level

PM8000 series

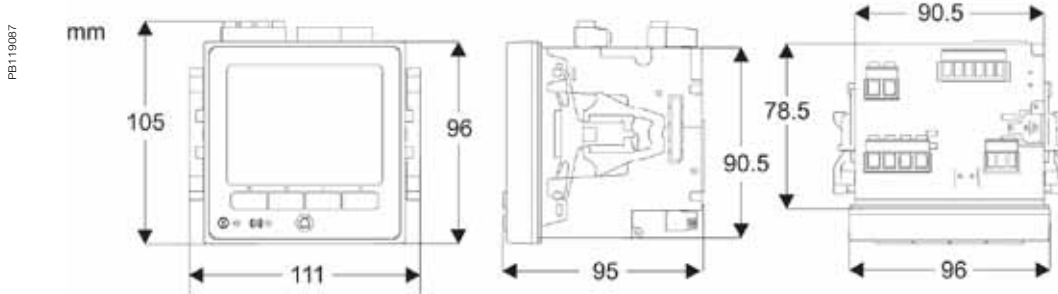
Electromagnetic compatibility	
Product standards	IEC 62052-11 and IEC 61326-1
Immunity to electrostatic discharge	IEC 61000-4-2
Immunity to radiated fields	IEC 61000-4-3
Immunity to fast transients	IEC 61000-4-4
Immunity to surges	IEC 61000-4-5
Immunity to conducted disturbances	IEC 61000-4-6
Immunity to power frequency magnetic fields	IEC 61000-4-8
Immunity to conducted disturbances, 2-150kHz	CLC/TR 50579
Immunity to voltage dips & interruptions	IEC 61000-4-11
Immunity to ring waves	IEC 61000-4-12
Conducted and radiated emissions	EN 55022, EN 55011, FCC part 15, ICES-003
Surge withstand Capability (SWC)	IEEE C37.90.1
Safety	
Safety Construction	IEC/EN 61010-1 ed.3, CAT III, 400 V L-N / 690 V L-L UL 61010-1 ed.3 and CSA-C22.2 No. 61010-1 ed.3, CAT III, 347 V L-N / 600 V L-L IEC/EN 62052-11, protective class II
Communication ⁽¹⁾	
Ethernet to serial line gateway	Communicates directly with up to 32 unit load ION slave devices.
Web server	Customisable pages, new page creation capabilities, HTML/XML compatible.
Serial port RS-485	Baud rates of 2400 to 115200, pluggable screw terminal connector.
Ethernet port(s)	2x 10/100BASE-TX, RJ45 connector (UTP).
Protocol	Modbus, ION, DNP3, IEC 61850, HTTP, FTR, SNMP, SMTP, DPWS, RSTP, NTP, SNTP, GPS protocols.
Firmware characteristics	
High-speed data recording	Down to 1/2 cycle interval burst recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined setpoint, or from external equipment.
Harmonic distortion	Up to 63rd harmonic (127th via Schneider Electric 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 of standard speed (1s) and high-speed (1/2 cycle) measurements, including true rms per phase and total for: voltage, current, active power (kW), reactive power (kvar), apparent power (kVA), power factor, 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	Historical trends and future forecasts to better manage demand, circuit loading, and other parameters. Provides average, min, max and standard deviation every hour for last 24 hours, every day for last month, every week for last 8 weeks and every month for last 12 months.
Waveform captures	Simultaneous capture of all voltage and current channels sub-cycle disturbance capture, maximum cycles is 100,000 (16 samples/cycle x 96 cycles, 10 MB memory), max 256 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 or automatic alarm threshold settings, user-defined priority levels (optional automatic alarm setting).

PM8000 series

Firmware characteristics (cont.)	
Advanced security	Up to 16 users with unique access rights. Perform resets, time sync, or meter configurations based on user privileges.
Memory	512 MB
Firmware update	Update via the communication ports.
Display characteristics	
Integrated or Remote display	320 x 240 (1/4 VGA) Colour LCD, configurable screens , 5 buttons and 2 LED indicators (alarm and meter status).
Languages	English, French, Spanish, Russian, Portugese,German, Italian, Chinese.
Notations	IEC, IEEE.
The HMI menu includes	
Alarms	Active alarms, historic alarms.
Basic Reading	Voltage, current, frequency, power summary.
Power	Power summary, demand, power factor.
Energy	Energy total, delivered, received.
Events	Timestamped verbose event log.
Power Quality	EN 50160, harmonics, phasor diagrams.
Inputs/Outputs	Digital inputs, digital outputs, analogue inputs, analogue outputs.
Nameplate	Model, serial and FW version.
Custom Screens	Build your own metrics.
Setup Menu	Meter setup, communications setup, display setup, date/time/clock setup, alarm setup, language setup, time of use setup, resets, password setup.

PM8000 series

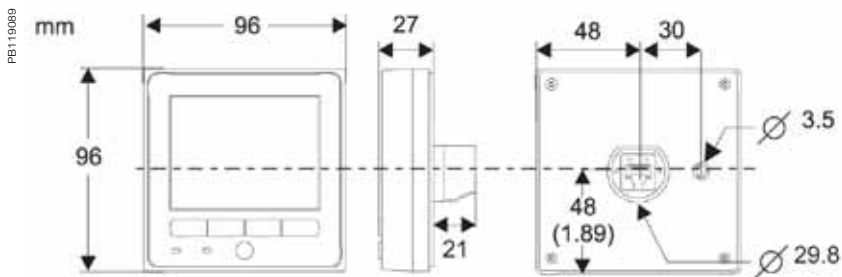
PM8240 & PM82401 dimensions



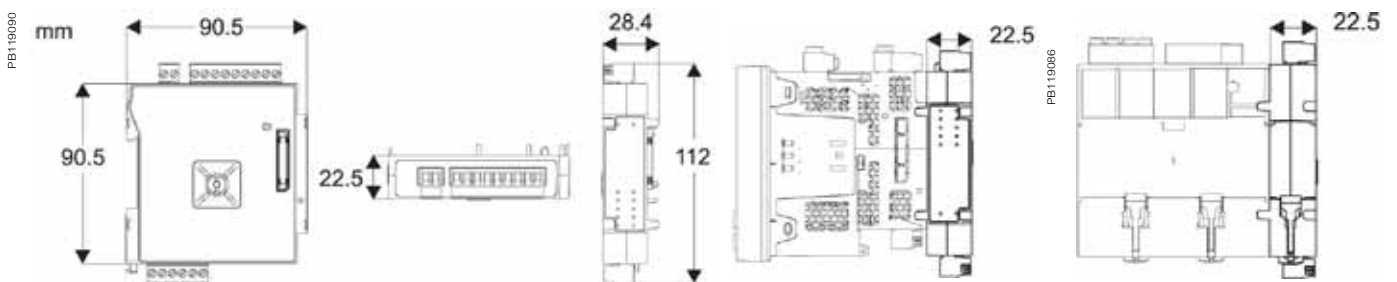
PM8243 dimensions



PM89RD96 dimensions



PM89M2600 & PM89M0024 dimensions



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

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As standards, specifications and designs develop from time to time, please ask for confirmation of the information given in this document.

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