

ION7550/7650 series

Technical Data Sheet

Ideal for both energy suppliers and consumers and loaded with advanced functionality for monitoring key distribution points and sensitive loads, the PowerLogic ION7550/7650 power and energy meter offers an unmatched feature set including advanced power quality analysis coupled with revenue accuracy, multiple communications options, web compatibility and control capabilities.

Applications

- Analysis of efficiency, losses and capacity
- Bill verification, cost allocation and sub-metering
- Power quality compliance monitoring
- Problem notification and diagnosis
- Demand or power factor management
- Control of loads, generators or other equipment

PE60126



The solution for

Markets that can benefit from a solution that includes PowerLogic ION7550/7650 series meters:

- Critical buildings
- Industry
- Data centres and networks
- Infrastructure (eg. Airports, road tunnels, telecom)

Competitive advantages

ION technology

- Customise metering or analysis functions at your work station without hard wiring
- Just link drag-and-drop icons or select default settings
- Flexibility of connectivity
- Be integrated with EcoStruxure™ Power Monitoring Expert or share data with SCADA systems via multiple communication channels and protocols

Benefits

The PowerLogic ION7550/ION7650 meters help you:

- Reduce energy and operations costs
- Improve power quality, reliability and uptime
- Optimise equipment use for optimal management of your electrical installation and greater productivity

Power management solutions

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

Conformity of standards

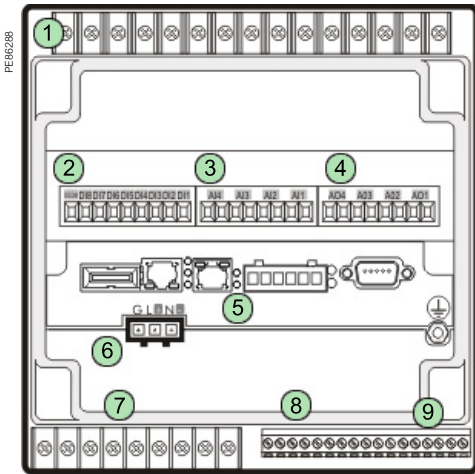
- | | |
|-----------------|-------------------|
| • CBEMA/ITIC | • IEC 61000-4-30* |
| • CISPR 22 | • IEC 61010-1 |
| • EN 50160* | • IEC 62053-22 |
| • IEC 61000-4-2 | • IEEE 1159 |
| • IEC 61000-4-3 | • IEEE 1453* |
| • IEC 61000-4-4 | • IEEE 519 |
| • IEC 61000-4-5 | • *ION7650 only |

ION7550/7650 series

Main characteristics

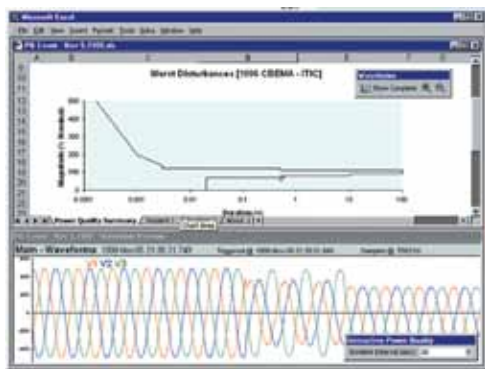
- Anticipate, diagnose and verify to increase efficiency
 - Reveal energy inefficiencies or waste and optimise equipment operation to increase efficiency. Isolate reliability risks, diagnose power-related equipment issues and verify reliable operation.
- Summarise power quality, set targets, measure 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 configurable 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 or telephone network (ModemGate) to Modbus communicating devices connected to meter serial ports.
 - Detect and capture transients as short as 20 μ s at 50 Hz (17 μ s 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. 3(1), EN50160:2010, 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 (ION7650 only).

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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



Disturbance waveform capture and power quality report

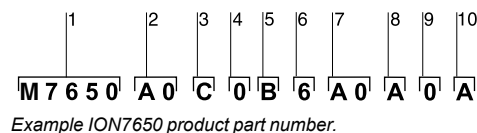
Selection guide

		ION7550	ION7650
General			
Use on LV and HV systems		■	■
Current accuracy (1 A to 5 A)		0.1 % reading	0.1 % reading
Voltage accuracy (57 V to 288 V)		0.1 % reading	0.1 % reading
Energy accuracy		0.2 Class	0.2 Class
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 - 20 A	0.01 - 20 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		■	■
Synchronization 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		■	■
EN 50160 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 synchronization (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		■	■

ION7550/7650 series

Part numbers

	Item	Code	Description
1	Model	M7650	Advanced meter with wide-range voltage inputs (57-347 V 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 5 MB 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 A nominal, 20 A full scale current input
		E	1 A nominal, 10 A full scale current input
		F	Current Probe Inputs (for 0-1 V AC current probes; sold separately)
		G	Current Probe Inputs with three Universal Technic 10 A clamp on CTs; meets IEC 1036 accuracy
4	Voltage Inputs	0	57 to 347 V AC line-to-neutral / 100 to 600 V AC line-to-line
5	Power Supply	B	Standard power supply (85-240 V AC, ±10%/47-63 Hz / 110-300 V DC, ±10%)
		C	Low voltage DC power supply (20-60 V DC)
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, 56 k 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 56 k universal internal modem (RJ11). Modem gateway function uses a serial port.
8	I/O	A	Standard I/O (8 digital ins, 3 Form C relays, 4 Form A solid-state out)
		E	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue inputs)
		K	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue outputs)
		N	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 20 mA analogue inputs and four 0 to 20 mA outputs)
		P	Standard I/O plus Expansion I/O card (8 additional digital inputs & four 0 to 1 analogue inputs and four -1 to 1 mA analogue outputs)
9	Security	0	Password protected, no hardware lock
		1	Password protected, hardware lockable (enabled/disabled via jumper on comm card)
10	Special order options	A	None
		C	Tropicalization treatment applied
		E	EN 50160 compliance monitoring and IEC 61000-4-30 Class A measurements (ION7650 only)
		F	EN 50160 compliance monitoring and IEC 61000-4-30 Class A measurements and tropicalization treatment (ION7650 only)



- 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

ION7550/7650 series

ION75XX/76XX Accessories

Commercial ref. no.	Communication Card for ION7550/7650
P765CA0A	Standard Comms: 1 RS-232/RS-485 port (COM1), 1 RS-485 port (COM2), Front optical port (COM3)
P765CA0C	Standard Comms: 1 RS-232/RS-485 port (COM1), 1 RS-485 port (COM2), Front optical port (COM3), tropicalisation treatment applied
P765CC1A	Standard plus Ethernet (10/100BASE-T), 56k universal internal modem (RJ11; shares COM3)
P765CC1C	Standard plus Ethernet (10/100BASE-T), 56k universal internal modem (RJ11; shares COM3), tropicalisation treatment applied
P765CD7A	Standard plus Ethernet (10/100BASE-T, 100BASE-FX), 56k internal modem (RJ11)
P765CD7C	Standard plus Ethernet (10/100BASE-T, 100BASE-FX), 56k internal modem (RJ11), tropicalisation treatment applied
P765CE0A	Standard plus Ethernet (10/100BASE-T)
P765CE0C	Standard plus Ethernet (10/100BASE-T), tropicalisation treatment applied
P765CF1A	Standard plus Ethernet (10/100BASE-T, 100BASE-FX)
P765CF1C	Standard plus Ethernet (10/100BASE-T, 100BASE-FX), tropicalisation treatment applied
P765CM1A	Standard plus 56k universal internal modem (RJ11; shares COM3)
P765CM1C	Standard plus 56k universal internal modem (RJ11; shares COM3),tropicalisation treatment applied
Commercial ref. no.	Analogue I/O cards
P760AEA	four 0 to 20 mA analogue inputs & 8 digital inputs
P760AEC	four 0 to 20 mA analogue inputs & 8 digital inputs,tropicalisation treatment applied
P760AKA	four 0 to 20 mA analogue outputs & 8 digital inputs
P760AKC	four 0 to 20 mA analogue outputs & 8 digital inputs,tropicalisation treatment applied
P760ANA	four 0 to 20 mA analogue inputs, four 0 to 20 mA analogue outputs & 8 digital inputs
P760ANC	four 0 to 20 mA analogue inputs, four 0 to 20 mA analogue outputs & 8 digital inputs,tropicalisation treatment applied
P760APA	four 0 to 1 analogue inputs, four -1 to 1 mA analogue outputs & 8 digital inputs.
P760APC	four 0 to 1 analogue inputs, four -1 to 1 mA analogue outputs & 8 digital inputs,tropicalisation treatment applied
Commercial ref. no.	ION 7550/7650 Related Items
OPTICAL-PROBE	Serial Optical Probe (DB-9) via IR port
OPTICAL-PROBE-USB	USB Optical Probe via IR port
P765GSKT	Gasket for ION7x50 meters and RTU - IP 52 & UL NEMA 12
M765RD	ION7550/7650 remote display, Schneider Electric branded
M765RDPS	ION7550/7650 remote display kit, includes display, 24 VDC power supply and Ethernet cable, Schneider Electric branded
TERMCVR-7550	Terminal strip cover
M1UB10A1V-10A	10 A/1 V AC Universal Technic Clamp On Current Probe (Price per probe)
P32UEP813-1000A	1000 A/1 V AC Universal Technic Clamp On Current Probe (Price per probe)
P32UEP815-3000A	3000 A/1 V AC Universal Technic Clamp On Current Probe (Price per probe)
SCT1250-300-300A	300 A/0.333 V AC Magnelabs Split Core Current Probe (Price per probe)

ION7550/ION7650 series

Technical specifications		
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	±0.005 Hz
	Power factor	±0.002 from 0.5 leading to 0.5 lagging
	Energy:	IEC 62053-22 0,2S, 1A and 5A
Data update rate	1/2 cycle or 1 second	
Input-voltage characteristics	Measurement range	Autoranging 57 V through 347 V L-N / 600 V L-L
	Impedance	5 MΩ/phase (phase - Vref)
	Frequency measurement range	42 to 69 Hz
Input-current characteristics	Rated nominal current	1 A, 2 A, 5 A, 10 A
	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 (5 A) 50 A rms for 1s, non-recurring (1 A)
	Impedance	0.002 Ω per phase (5 A) 0.015 Ω per phase (1 A)
	Burden	0.05 VA per phase (5 A) 0.015 VA per phase (1 A)
Power supply	AC	85-240 V AC ±10% (47-63 Hz)
	DC	110-300 V DC ±10 %
	DC low voltage (optional)	20-60 V DC ±10 %
	Ride-through time	100 ms (6 cycles at 60 Hz) min.
Burden	Standard: typical 20 VA, max 45 VA Low voltage DC: typical 15 VA, max 20 VA	
Input/outputs ⁽¹⁾	Standard	8 digital inputs (120 V DC) 3 relay outputs (250 V AC / 30 V DC) 4 digital outputs (solid state)
	Optional	8 additional digital inputs 4 analogue outputs, and/or 4 analogue inputs
Mechanical characteristics		
Weight	1.9 kg	
IP degree of protection (IEC 60529)	Integrated display, front: IP 50; back: IP 30 Transducer unit (no display): IP 30	
Dimensions	Standard model	192 x 192 x 159 mm
	TRAN model	235.5 x 216.3 x 133.1 mm
Environmental conditions		
Operating temperature	Standard power supply	-20 to 70 °C
	Low voltage DC supply	-20 to 50 °C
	Display operating range	-20 to 60 °C
Storage temperature	Display, TRAN	-40 to 85 °C
Humidity rating	5 to 95 % non-condensing	
Installation category	III (2000 m above sea level)	
Dielectric withstand	As per EN 61010-1, IEC 62051-22A	
Electromagnetic compatibility		
Electrostatic discharge	IEC 61000-4-2	
Immunity to radiated fields	IEC 61000-4-3	
Immunity to fast transients	IEC 61000-4-4	
Immunity to surges	IEC 61000-4-5	
Conducted and radiated emissions	CISPR 22	
Safety		
Europe	IEC 61010-1	
Communication		
RS-232/485 port ⁽¹⁾	Up to 115,200 baud (57,600 bauds for RS-485), ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master	
RS-485 port ⁽¹⁾	Up to 57,600 baud, ION, DNP 3.0, Modbus, GPS, EtherGate, ModemGate, Modbus Master	
Infrared port ⁽¹⁾	ANSI type 2, up to 19,200 baud, ION, Modbus, DNP 3.0	
Ethernet port	10BASE-T/100BASE-TX, RJ45 connector, 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	

ION7550/7650 series



Communication (cont.)

Protocol	ION, Modbus, TCP/IP, DNP 3.0, Telnet, IEC 61850 ⁽²⁾
EtherGate	Communicates directly with up to 62 slave devices via available serial ports
ModemGate	Communicates directly with up to 31 slave devices
Ethernet port	10BASE-T/100BASE-TX, RJ45 connector, 100 m link
WebMeter	5 customisable pages, new page creation capabilities, HTML/XML compatible

Firmware characteristics

High-speed data recording	Down to 5 ms interval burst recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined setpoint, or from external equipment.
Harmonic distortion	Up to 63 rd harmonic (511 th 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, 10MB 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 MB (specified at time of order)
Firmware update	Update via the communication ports

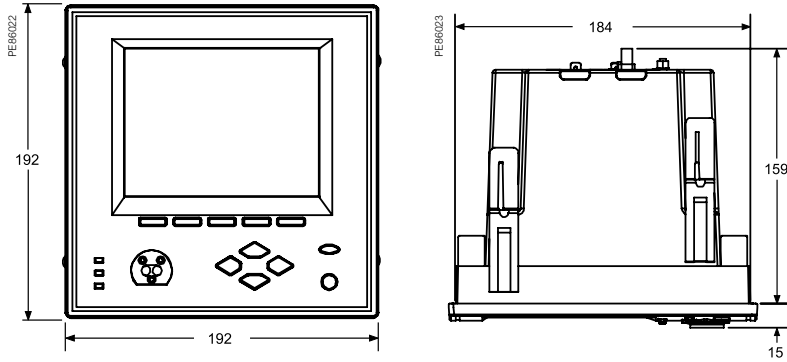
Display characteristics

Integrated display	Backlit LCD, configurable screens
Languages	English, French, Spanish, Russian
Notations	IEC, IEEE

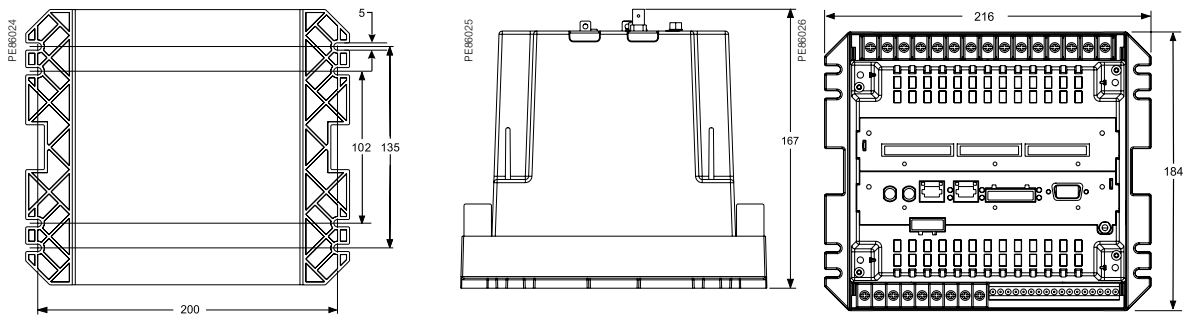
(1) Consult the ION7550 / ION7650 installation guide for complete specifications.
 (2) IEC 62051-22B with serial ports only.

ION7550/ION7650 series

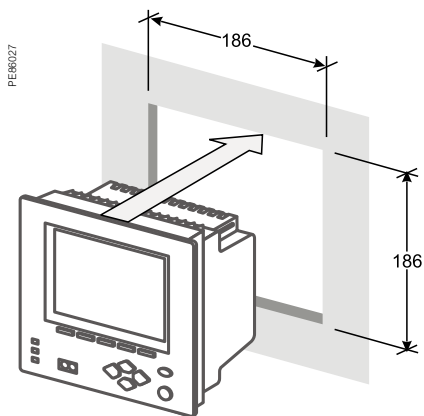
ION7550/ION7650 dimensions



ION7550/ION7650 TRAN dimensions



Front-panel mounting



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

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

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Product name
PLSED306011EN

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