

PowerLogic™ EM4900 series Technical Datasheet

The PowerLogic™ EM4900 Series Multi-Circuit Meters make it easy to add many metering points without having to purchase, mount, wire and commission individual energy meters. Simply add a single device with common voltage inputs and communication interface that can measure the current, voltage, power, energy consumption, and Total Harmonic Distortion (THD) of up to (14) 3-phase circuits with a single board or up to (28) 3-phase circuits with a two board configuration. Save on both equipment cost and installation.

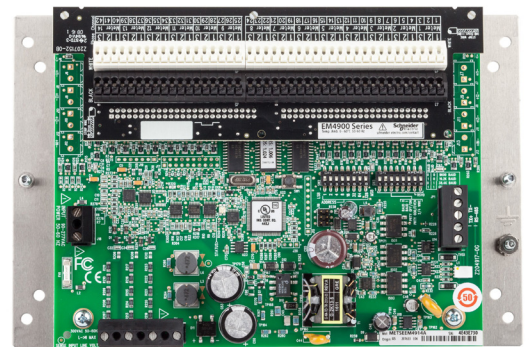
Applications

- Commercial and residential subtenant billing
- Load-based cost allocation
- Measuring for load balancing and demand response
- Overload protection

PB117150



PB117149



METSEEM4904E



METSEEM4904A

The solution for

Markets that can benefit from a solution that includes PowerLogic™ EM4900 series meters:

- Buildings
- Industry
- Healthcare
- Hotels, Multi-Dweller Units (condos)

Benefits

System integrators' benefit

- Ease of integration
- Ease of setup
- Cost effectiveness

Panel builders' benefit

- Ease of installation
- Cost effectiveness
- Aesthetically pleasing
- Simplified ordering

End users' benefit

- Ease of use
- Precision metering & sub-billing
- Billing flexibility
- Comprehensive, consistent and superior performance

Competitive advantages

- Lower cost and space per metering point
- Adapts to any mix of metering needs (1ph, 2ph, 3ph with or without Neutral wire)
- Class 0.5 accuracy for Revenue Grade measurement
- THD monitoring to help identify problem loads and early wear and tear
- Capable of concurrent communication to software packages, including PowerLogic™ software packages and third party systems

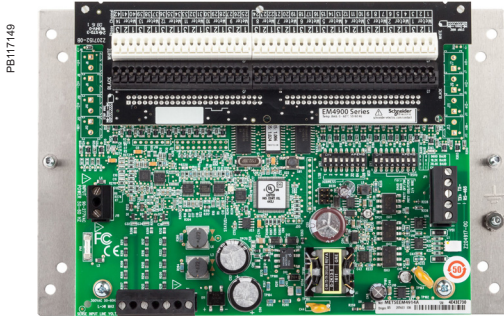
Power management solutions

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

- EN 61000-6-3 Class B - Part 6-3
- EN 61000-6-3 Class B - Part 6-3
- EN 61000-6-4 Class A - Part 6
- EN 61010-1 - Part 1
- EN 61326-1 Class A - Part 1
- EN 61326-1 Class B - Part 1
- IEC 62053-22 Class 0.5 - Part 21
- FCC 47 CFR Part 15 Class A & Class B
- UL 508 Open Device Type
- IEC 61010-1 - Part 1

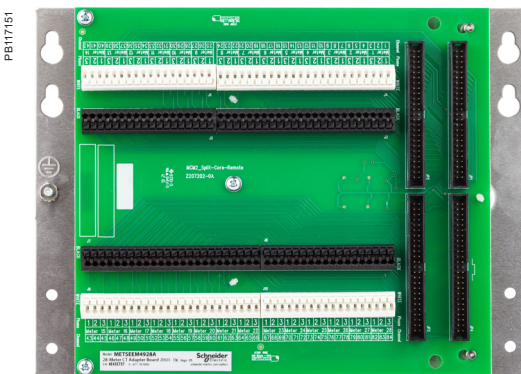
EM4900 series



PowerLogic™ EM4914A



PowerLogic™ EM4914E



28 Meter adapter board (EM4928A and EM4928E)

To aid in commissioning, a configuration software tool, an Ethernet discovery tool (for the EM49xxE) and a User Guide are available online at www.se.com.

- Main characteristics

- Add lots of metering points without lots of cost
- Add up to 28 3-phase meters by installing a single product small enough to fit inside many distribution panels. Save on both equipment cost and installation cost. Common voltage and communication connections and color-coded push-in CT connections save installation time and effort.
- Class 0.5 accuracy for Revenue Grade measurements
- Power and Energy measurements with ANSI and IEC class 0.5 accuracy provide the accuracy needed for tenant billing applications. Voltage and current measurement accuracy is 0.5 % and currents are measured down to 0.1% of the CT range. Easily differentiate between the flow of low current and a trip or load disconnect where no current flows.
- Total Harmonics Distortion measurements
- Helps assess basic power quality to reduce risks to the load and provide indication of potential early wear and tear of the electrical network and its load.
- Common CTs, 1/3V outputs
- CTs with low-voltage outputs eliminate the need for shorting blocks that add cost and labor to the installation. They also allow long CT lead extensions without compromising accuracy. Choose from a range of our CT styles and sizes or use any CTs with industry-standard 0.333V outputs.
- Models with integrated Ethernet offer broad protocol support
- All models integrate easily into existing networks using Modbus RTU communications over an RS-485 serial link. EM49xxE models offer integrated Ethernet and add support for Modbus TCP, BACnet IP, BACnet MS/TP and SNMP. Those Ethernet protocols can be run in parallel allowing multiple software to access the device (Building Management System, Energy Management System, etc.) An optional external gateway can be added to EM49xxA models to offer the same capability.
- Compatible with PowerLogic™ power monitoring software
- Easily turn the large amount of data collected by the devices into useful decision making information.
- Configure the meters you want
- Choose 4, 8, 14 or 28 3-phase meters. User-configurable to any combination of 1-, 2-, 3-phase meters. Reconfigure channels as needed to monitor neutral current.

EM4900 series

Technical specifications

Measurements	
Measurement voltage	90 to 300 V AC L-N, 50/60 Hz
Total Harmonic Distortion (THD)	THD % voltage L-L, L-N and THD % on current
Control power	
EM49xxA	90 to 277 V AC L-N, 50/60 Hz
EM49xxE	100 to 277 V AC L-N, 50/60 Hz
Accuracy	
Power/Energy	IEC 62053-21 Class 0.5, ANSI C12.20 class 0.5
Voltage	±0.5% of reading 90 to 277 V L-N
Current	±0.5% of reading from 2% to 100% of full-scale
Operation	
Sampling frequency	2560 Hz
Update rate	1.8 seconds (both panels)
Overload capability	22 kAIC
EM49xxA serial communication	
Type	Modbus RTU
Connection	DIP switch-selectable 2-wire or 4-wire, RS-485
Address	DIP switch-selectable address 1 to 247 (in pairs of 2) (See Installation Guide)
Baud rate	DIP switch-selectable 9600, 19200, 38400
Parity	DIP switch-selectable NONE, ODD, EVEN
Communication format	8 data bits, 1 start bit, 1 stop bit
Termination	5-position plug-in connector (TX+ TX- SHIELD TX+/RX+ TX-/RX-)
EM49xxE serial communication	
Physical Interface	2-wire RS-485
Serial protocols supported	Modbus RTU or BACnet MS/TP
Address range	1 to 247 for Modbus RTU; 0 to 127 for BACnet MS/TP
Baud rate	9600, 19200, 38400
Parity	Modbus RTU: NONE, ODD, EVEN BACnet MS/TP: NONE (fixed)
Communication format	8 data bits, 1 start bit, 1 stop bit
Termination	2x3 position connector
EM49xxE Ethernet communication	
Physical interface	Protocols Supported
Protocols supported	Modbus TCP, BACnet IP, SNMP V2c
Wire size range	
Removable connectors on main board	24 to 12 AWG
CT Terminals and EM49xxE serial connector terminals	26 to 16 AWG
Terminal block torque	
Removable connectors	0.5 to 0.6 N-m
Mechanical	
Ribbon cable support (28-meter models only)	0.9 m round ribbon cable ships standard; up to 6 m flat or round available
Operating conditions	
Operating temperature range	0 to 60 °C (<95% RH non-condensing)
Storage temperature range	-40 to 70 °C
Altitude of operation	3000 m
Mounting location	Not suitable for wet locations. For indoor use only.
Compliance information	
Agency approvals	UL 508 open type device ^{*1} , IEC/EN 61010-1
Installation category	Cat III, pollution degree 2 ^{*2}
Conducted emissions	EM49xxA Models: FCC part 15 Class B, EN 61000-6-3, EN 61326-1 Class B (residential & light industrial)
Radiated emissions	EM49xxE Models: FCC part 15 Class A, EN 6100-6-4, EN 61326-1 Class A
Conducted and radiated immunity	EN 61000-6-2 and EN 61326-1

^{*1} Install EM49xx in appropriate fire enclosure; if used with circuits higher than product ratings, circuits must be segregated per UL 508A Sec 17.5 (EM49xx internal circuitry are not circuits as defined by UL 508A).

^{*2} A Pollution Degree 2 environment must control conductive pollution and the possibility of condensation or high humidity. Consideration must be given to the enclosure, the correct use of ventilation, thermal properties of the equipment and the relationship with the environment.

EM4900 series

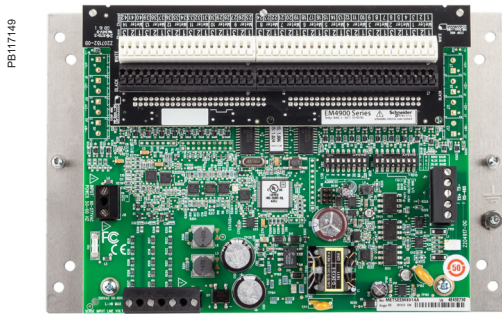
1/3 V low-voltage CT (LVCT)

Electrical characteristics	
Accuracy	1 % from 10 % to 100 % of rated current(LVCT0xxxx0S/1S/2S/3S/4S [split-core]) 0.5 % from 5 % to 100 % of rated current (LVCT2xxxx0S/2S/3S [solid core])
Frequency range	50/60 Hz
Leads	18 AWG, 600 V AC, 1.8 m standard length
Max. voltage L-N sensed conductor	300 V AC (LVCT0xxxx0S) 600 V AC (LVCT0xxxx1S/2S/3S/4S, LVCT2xxxxS)
Measurements	
Real time measurements	Current: multi-phase average and per phase Current phase angle per branch Real power (kW): multi-phase total and per phase Apparent power (kVA): multi-phase total and per phase Power factor: multi-phase average and per phase
Demand measurements	Current present demand: multi-phase average and per phase Real power (kW) present demand: multi-phase average and per phase
Historic maximums	Maximum instantaneous current: multi-phase average and per phase Maximum current demand: multi-phase average and per phase Maximum real power demand: multi-phase total and per phase
Accumulate energy	Energy (kWh): multi-phase total and per phase
Energy snapshots	Energy (kWh): multi-phase total and per phase

EM4900 series



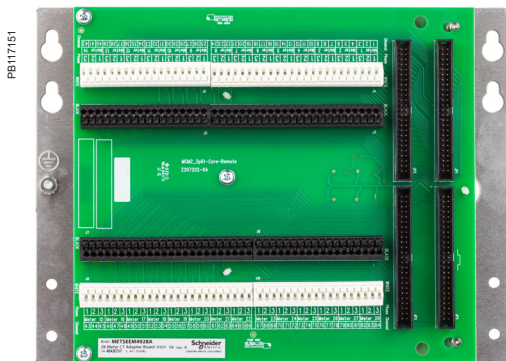
- 1 Model.
- 2 Number of 3-phase meters (without neutral current)
- 3 Communication interfaces & protocols.



EM49xxA Main Board



EM49xxE Main Unit



CT Adapter Assembly (28-Meter models only)

EM4900 series part numbers - BCPM with solid core CTs

Item	Code	Description
1 Model	METSEEM49	Multi-Circuit Meter
2 Number of 3-phase Meters	04	Up to (4) 3-phase Meters (see table for variations)
	08	Up to (8) 3-phase Meters (see table for variations)
	14	Up to (14) 3-phase Meters (see table for variations)
	28	Up to (28) 3-phase Meters (see table for variations)
3 Communication Interfaces & Protocols	A	RS-485 Serial with Modbus RTU (add E8951 for other protocols)
	E	Ethernet with Modbus TCP, BACnet IP and SNMP protocols and RS-485 Serial with Modbus RTU or BACnet IP

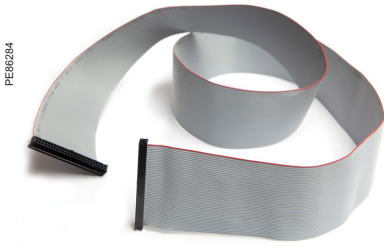
Commercial ref. no.	"E" - Integrated Ethernet	Number of meters		
		3-phase	2-phase	1-phase
METSEEM4904A	METSEEM4904E	4	6	12
METSEEM4908A	METSEEM4908E	8	12	24
METSEEM4914A	METSEEM4914E	14	21	42
METSEEM4928A	METSEEM4928E	28	42	84

Number of meters supported:

EM4900 models are all factory-configured as all 3-phase meters (w/o neutral). They can be easily re-configured to any combination of 1-ph, 2-ph or 3-ph meters (with ION Setup). Any unused channels can be used to measure neutral current. Label overlays (to re-number CT connections) are provided for 1-ph/2-ph applications.

Commercial ref. no.	EM4900 multi-circuit meters
METSEEM4904A	Multi-Circuit Meter – (4) 3-phase meters - Modbus RTU only
METSEEM4908A	Multi-Circuit Meter – (8) 3-phase meters - Modbus RTU only
METSEEM4914A	Multi-Circuit Meter – (14) 3-phase meters - Modbus RTU only
METSEEM4928A	Multi-Circuit Meter – (28) 3-phase meters - Modbus RTU only
METSEEM4904E	Multi-Circuit Meter – (4) 3-phase meters - Ethernet and Serial (Modbus, BACnet & SNMP)
METSEEM4908E	Multi-Circuit Meter – (8) 3-phase meters - Ethernet and Serial (Modbus, BACnet & SNMP)
METSEEM4914E	Multi-Circuit Meter – (14) 3-phase meters - Ethernet and Serial (Modbus, BACnet & SNMP)
METSEEM4928E	Multi-Circuit Meter – (28) 3-phase meters - Ethernet and Serial (Modbus, BACnet & SNMP)

EM4900 series



PE86284



CBL008

Flat ribbon cable



PB117152



CBL022

Round ribbon cable



PE66183



LVCT00050S

PowerLogic™ LVCT0xxxxS split-core Low-voltage (1/3V) CTs are ideal for retrofit applications



PB113852

PB113857

PB113858



LVCT20050S

PowerLogic™ LVCT2xxxxS Low-voltage (1/3V) solid core CTs are ideal for panel builders (small, medium, large)

EM4900 series accessories

Commercial reference number	Description
BCPMCOVERS	EM4900 circuit board cover
E8951	Modbus to BACnet protocol converter
Ribbon cables for 28-meter models	
1.22 m cables are standard – others must be ordered separately	
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
CBL031	Round Ribbon cable (quantity 1) for BCPM, length = 0.5 m
CBL033	Round Ribbon cable (quantity 1) for BCPM, length = 0.8 m

1/3 V low-voltage Split-core CTs

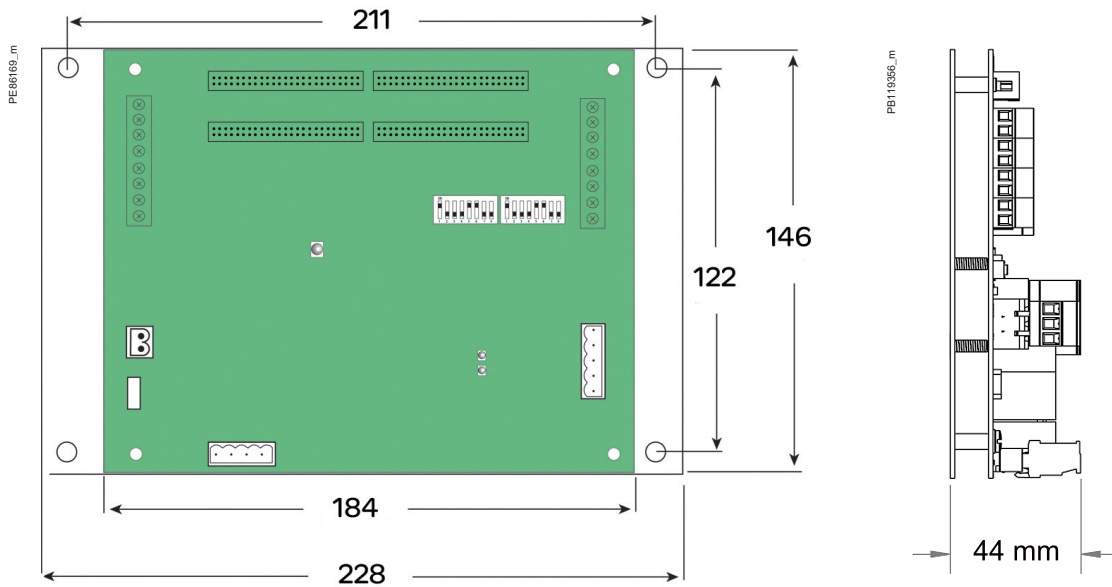
Commercial reference number	Amperage rating	Inside dimensions
LVCT00050S	50 A	10 x 11 mm
LVCT00101S	100 A	16 x 20 mm
LVCT00201S	200 A	32 x 32 mm
LVCT00102S	100 A	30 x 31 mm
LVCT00202S	200 A	30 x 31 mm
LVCT00302S	300 A	30 x 31 mm
LVCT00403S	400 A	62 x 73 mm
LVCT00603S	600 A	62 x 73 mm
LVCT00803S	800 A	62 x 73 mm
LVCT00804S	800 A	62 x 139 mm
LVCT01004S	1000 A	62 x 139 mm
LVCT01204S	1200 A	62 x 139 mm
LVCT01604S	1600 A	62 x 139 mm
LVCT02004S	2000 A	62 x 139 mm
LVCT02404S	2400 A	62 x 139 mm

1/3 V low-voltage Solid core CTs

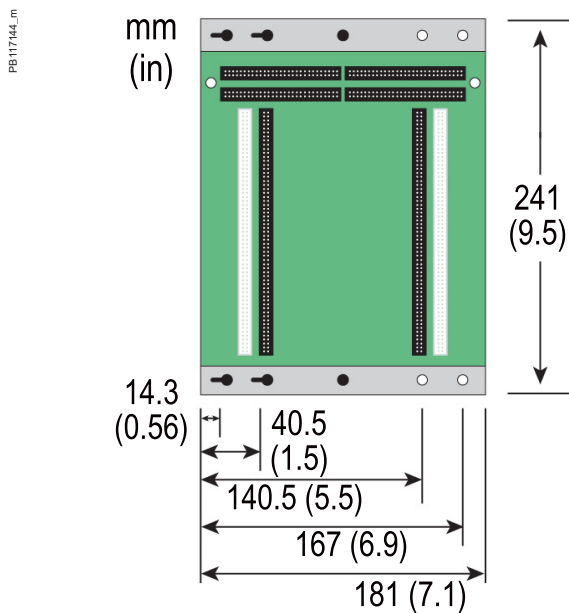
Commercial reference number	Amperage rating	Inside dimensions
LVCT20050S	50 A	10 mm
LVCT20100S	100 A	10 mm
LVCT20202S	200 A	25 mm
LVCT20403S	400 A	31 mm

EM4900 series

EM49xxA main board dimensions



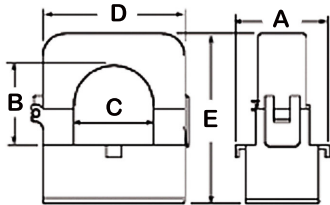
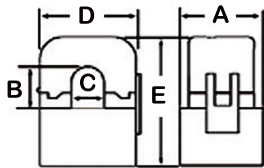
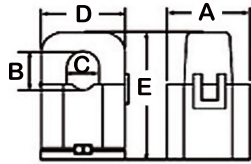
28-Meter CT adapter assembly dimensions



EM4900 series

50 A-200 A Split-core CT dimensions

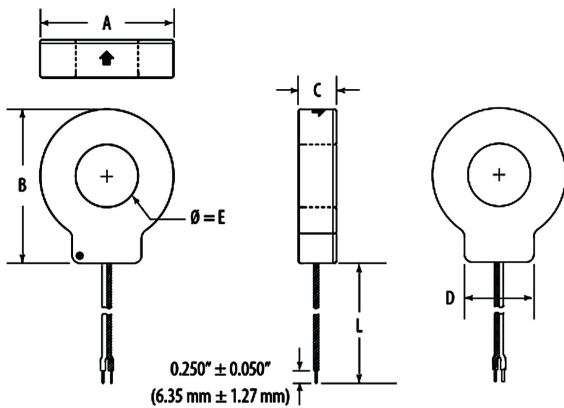
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CT rating	A	B	C	D	E
50 A	26 mm	11 mm	10 mm	23 mm	40 mm
100 A	28 mm	16 mm	16 mm	40 mm	52 mm
200 A	37 mm	32 mm	32 mm	62 mm	69 mm

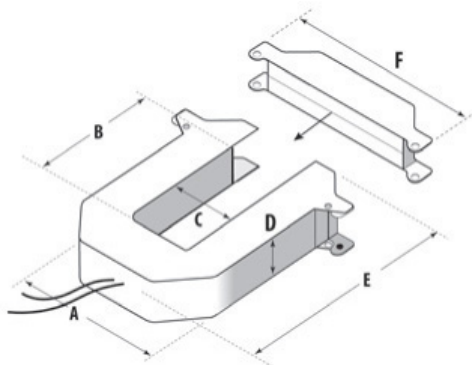
Solid core CT dimensions

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Model	L	A	B	C	D	E
LVCT20050S	1.8 m	33 mm	38 mm	18 mm	21 mm	10 mm
LVCT20100S		59 mm	66 mm	18 mm	31 mm	25 mm
LVCT20202S	1.8 m	70 mm	82 mm	25 mm	36 mm	31 mm

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Split-core CT dimensions - see table.

1/3 V low-voltage CT form factor

Small form factor 100/200/300 A	Medium form factor 400/600/800 A	Large form factor 800/1000/1200/ 1600/2000/2400 A
A = 96 mm	A = 125 mm	A = 125 mm
B = 30 mm	B = 73 mm	B = 139 mm
C = 31 mm	C = 62 mm	C = 62 mm
D = 30 mm	D = 30 mm	D = 30 mm
E = 100 mm	E = 132 mm	E = 201 mm
F = 121 mm	F = 151 mm	F = 151 mm



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PowerLogic™ EM4900 series
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