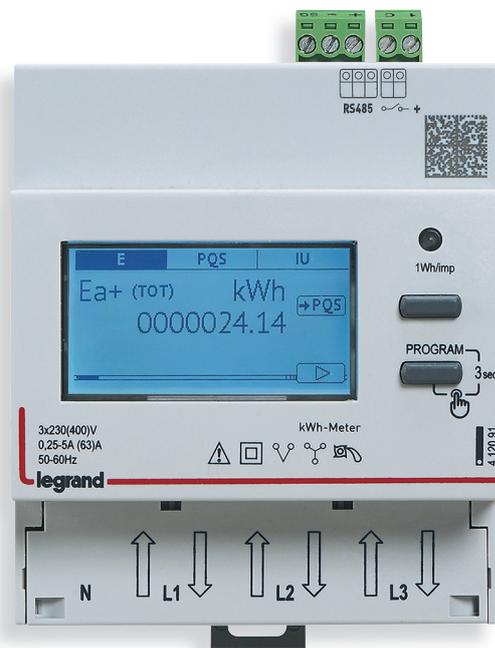


SMART ELECTRICITY METERS

# EMDX<sup>3</sup> SUSTAINABLE SAVINGS FOR YOUR INSTALLATIONS



→ CATALOGUE PAGES INSIDE

THE GLOBAL SPECIALIST IN ELECTRICAL AND  
DIGITAL BUILDING INFRASTRUCTURES

**legrand**



# Lasting savings for your installations



Living conditions and comfort can be improved by developing solutions that optimise energy efficiency.

Given that buildings account for 40% of electricity consumption and 20% of CO2 emissions, cutting energy consumption in buildings is a major issue in the fight against climate change.

The aim is for every user to reduce their bill, as well as their energy footprint and metering is the first step in making lasting savings and the basis of any diagnostics.

Thanks to the new range of EMDX<sup>3</sup> electricity meters, multi-function measuring units, the CX<sup>3</sup> EMS system or the DMX<sup>3</sup> and DPX<sup>3</sup> MCCBs incorporating measurement functions, Legrand has developed a smart infrastructure for displaying information on active and reactive power consumption, voltage disturbance, harmonic distortion, etc. according to the type of building.

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EMDX<sup>3</sup> MEASUREMENT CONTROL UNITS

## REAL SYNERGY WITH EMDX<sup>3</sup> MULTI-FUNCTION MEASURING UNITS

EMDX<sup>3</sup> multi-function measuring units record the energy consumed by the various circuits, measure the electrical values (current, voltage, power, etc) or analogue values (temperature) to check the installation is working properly. They monitor energy quality by analysing harmonics and measuring the reactive energy.

They also communicate the values measured to supervision or energy management systems, in order to optimise the consumption and energy quality of electrical circuits in commercial and industrial environments.

In accordance with its policy of continual improvement, the company reserves the right to modify the characteristics and design of its products without warning. All illustrations, descriptions, dimensions, and weights indicated in this catalogue are given as a guide only and the company cannot be held liable for their accuracy.



# Measurement is the basis of all diagnostics

By measuring your electricity consumption, you can:

- become more aware of your consumption
- adopt a constant operating regime to smooth out consumption over time
- identify potential savings and implement actions and solutions to cut your consumption.

Thanks to the new range of EMDX<sup>3</sup> electricity meters and our supervision solutions, it is possible to analyse consumption data and improve processes. It is also possible to manage multi-site electrical installations remotely or locally using a smartphone, tablet, or a PC.



EMDX<sup>3</sup> THREE-PHASE METER

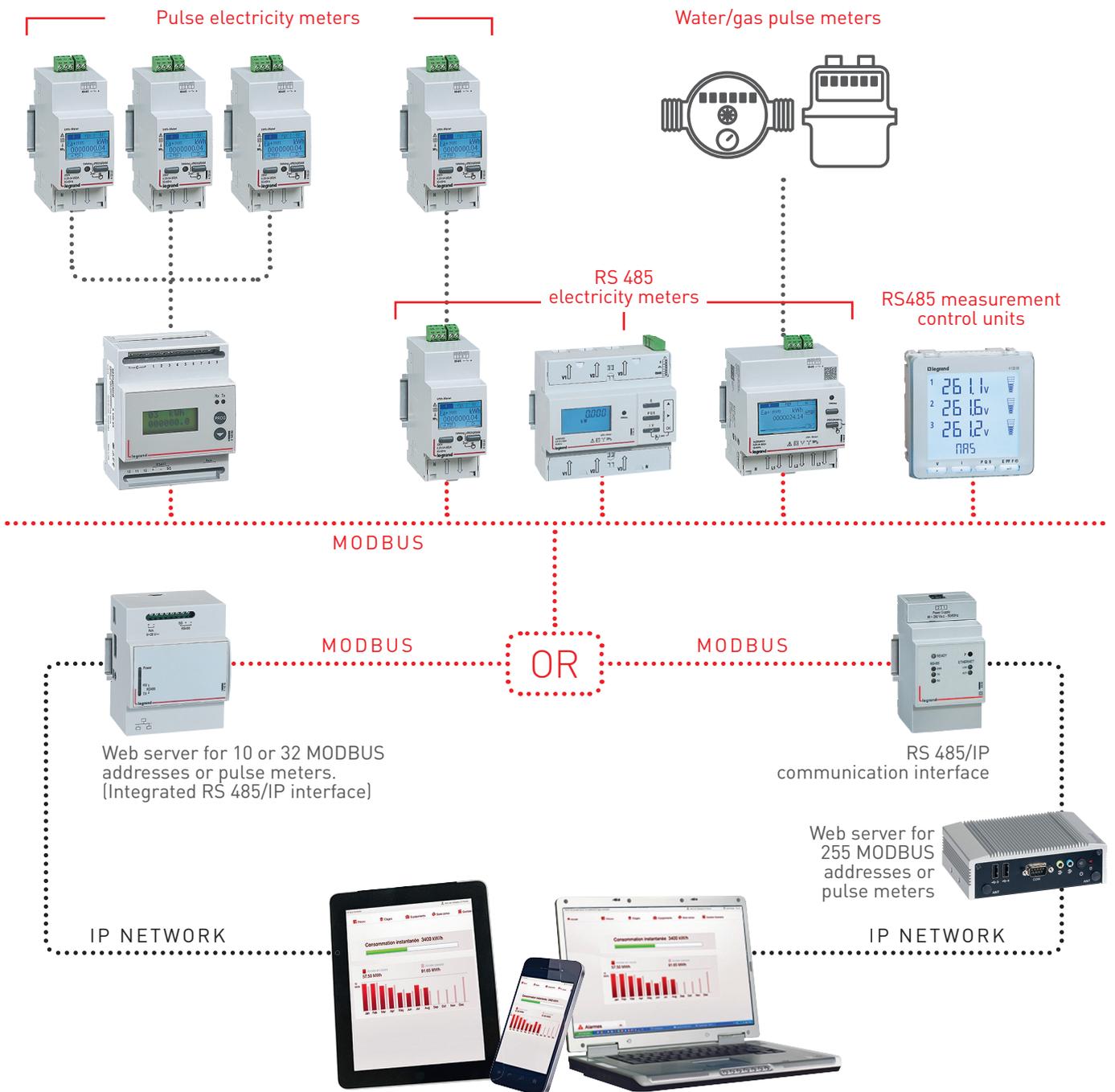
## EU DIRECTIVE 2012/27/EU

The European Energy Efficiency Directive 2012/27/EU dated 25 October 2012 imposes an obligation on large companies to conduct an energy audit, which should be repeated every 4 years. The energy audit should be conducted based on the energy performance of the building(s) concerned. To do this, all significant energy use should be identified in order to define opportunities for improvement. An energy inventory is conducted based on an assessment of consumption and identification of usage (by category).

# Schematic diagram of an installation:

An installation can record several meters and measurement control units, connected on a Modbus network. The RS 485/IP communication interface and web servers can be used for remote control.

The pulse concentrator can collect measurements from 12 of the pulse electricity meters and send the information over the Modbus network using the RS 485 output.





# A range suitable for a variety of uses

The new EMDX<sup>3</sup> electricity meters measure and display values such as: total active energy, total reactive energy, partial active energy, active power, reactive power, apparent power, average active power, the maximum value of

the average active power, current, voltage, frequency, the power factor, the running time (per tariff) per single-phase or three-phase circuit downstream of the electricity supply company's metering.



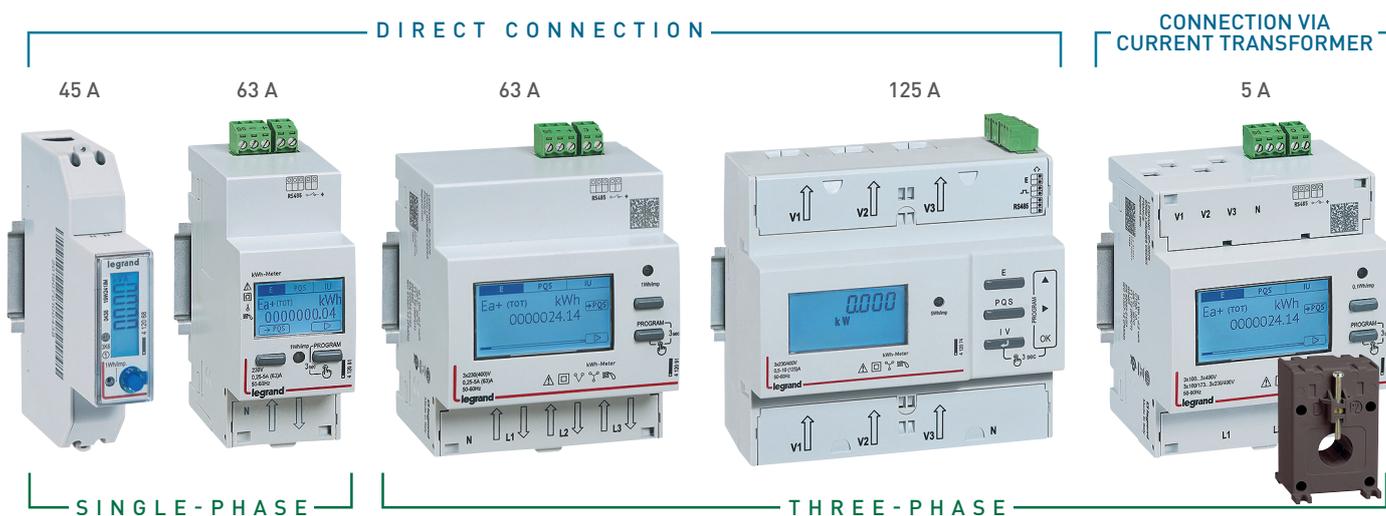
EXAMPLE OF A PHOTOVOLTAIC INSTALLATION

## A MULTIMETERING MID-CERTIFIED RANGE

Possibility of bi-directional metering of active and reactive energy consumed/produced (Ea+ and Ea-/Er+ and Er-) which makes them particularly suitable for buildings equipped with a power plant (photovoltaic, wind).

MID certification ensures accuracy of the metering with a view to charging out the electricity consumed or produced.

A meter should be selected according to the network (single-phase or three-phase) and its maximum current, required displayed values and communication type allowing it to be run by a supervision system.



Conforming to standards IEC 61557-12, IEC 62053-21/23, IEC 62052-11, IEC 62052-31, EN 50470-1/3 (for the MID version)

	Cat.No	I <sub>max</sub> (A)	Width (number of modules)	Non-MID	MID	Output		Dual-rate	1 pulsed input
						Modbus (RS 485)	Pulse		
 Single-phase Direct connection	0 046 70	32	1	x			x		
	4 120 68	45	1	x		x			
	4 120 69	45	1		x		x		
	4 120 80	63	2	x			x		x
	4 120 81	63	2	x		x		o	o
	4 120 82	63	2		x		x		x
 Three-phase Direct connection	4 120 90	63	4	x			x		x
	4 120 91	63	4	x		x		o	o
	4 120 92	63	4		x		x		x
	4 120 93	63	4		x		x	o	o
	4 120 74	125	6	x		x	x	x	
	4 120 75	125	6		x		x	x	
 Three-phase Connection via current transformer	4 120 40	5	4	x			x		x
	4 120 41	5	4	x		x		o	o
	4 120 42	5	4		x		x		x
	4 120 43	5	4		x		x	o	o

 New range

x Built-in

o 2 options: dual-rate or 1 pulse input for other meters (gas, water, etc)

The dual-rate function allows energy consumption to be measured during different time slots (peak period, off-peak period) or record energy use from two different sources (normal or backup) with a single meter.



# An intuitive system that is easy to use



WEB SERVERS

EMDX<sup>3</sup> electricity meters can be used to display consumption locally, in the distribution board or remotely via the internet. They have two types of output that allow them to be integrated in a smart system: RS 485 Modbus or pulse.

The communication function makes it possible to:

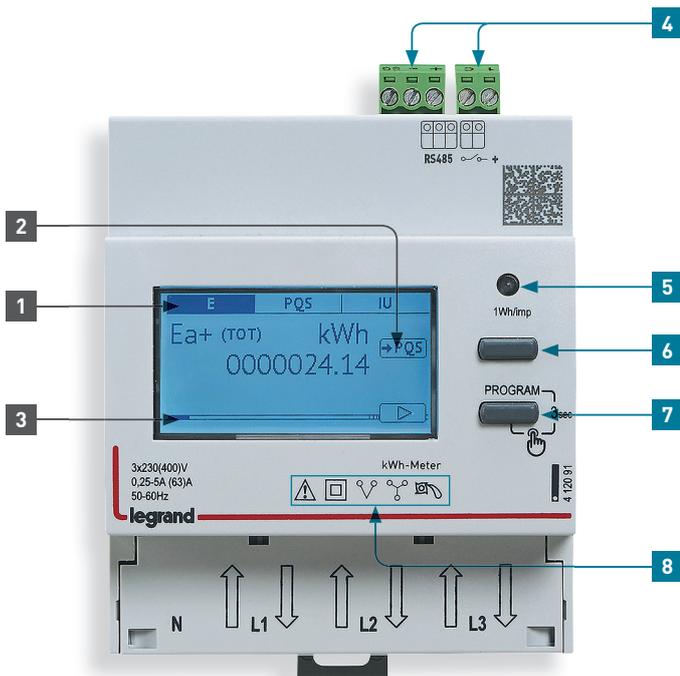
- centralise consumption
- reproduce electrical values remotely via web servers.

## TWO TYPES OF WEB SERVER DEPENDING ON THE SIZE OF THE INSTALLATION

Web servers can be used to display consumption on any type of screen equipped with a web browser: PC, smartphone, tablet, for installations with up to 255 Modbus addresses or pulse meters.

# Intuitive browsing

Browsing through menus to display the measured values happens intuitively, using just two buttons. It's quick and easy to preview the configuration settings, without needing to go into the configuration menu.



- 1** Current menu (whose pages are displayed on-screen)
- 2** Next menu, accessible by pressing the corresponding button
- 3** Scroll bar indicating progress through the pages displayed

- 4** Removable terminal blocks:
  - input for dual-tariff energy metering
  - pulse output or Modbus connection



- 5** Metrology LED
- 6** Function button, which can be used to browse between the various page menus (located at the top of the screen): E (energy), PQS (powers) and IU (current and voltage)
- 7** Dual-function button:
  - quick press → pages scroll through the current menu (indicated at the top of the screen)
  - press for 3 sec. → activates configuration mode
- 8** Technical marking:
  - Please consult the user manual before continuing with installation.
  - Double insulation
  - Activation on 3-wire three-phase line
  - Activation on 4-wire three-phase line
  - Anti-rotation (antidimintion)

# Simplified installation and connection

The phase and neutral terminals have the same dimensions and are offset to make wiring easier.

Three-phase meters can be used to display phase sequences to ensure they are connected correctly.

All the meters have a built-in 120 Ohm termination resistor on the RS 485 line, which can be configured in programming mode.



Clear marking indicating the terminal position and wiring direction.



Sealed terminal shield to prevent unauthorised access.

## EMDX<sup>3</sup> electrical energy meters

┌ rail mounting



Technical characteristics p. 13

Measure the electricity consumed by a single-phase or three-phase circuit downstream of the electricity distribution metering. Display electricity consumption in kWh, as well as other values such as current, active energy, reactive energy and power (depending on the catalogue number). Conform to standards IEC 61557-12, IEC 62053-21/23, IEC 62052-11 and IEC 62052-31. MID compliance ensures accuracy of the metering with a view to recharging for the electricity used.

Pack	Cat.Nos		Single-phase meters	Direct connection	Maximum current (A)	Output type	Dual tariff	Number of modules
	Non-MID	MID compliant						
1	0 046 70				32	Pulse	No	1
1	4 120 68				45	RS 485	No	1
1		4 120 69			45	Pulse	No	1
1	4 120 80	4 120 82			63	Pulse	No	2
1	4 120 81	4 120 83			63	RS 485	Yes	2

Pack	Cat.Nos		Three-phase meters	Direct connection	Maximum current (A)	Output type	Dual tariff	Number of modules
	Non-MID	MID compliant						
1	4 120 90 <sup>1</sup>	4 120 92 <sup>1</sup>			63	Pulse	No	4
1	4 120 91	4 120 93			63	RS 485	Yes	4
1	4 120 74	4 120 75			125	Pulse and RS 485	Yes	6
1	4 120 40 <sup>1</sup>	4 120 42 <sup>1</sup>		Connection with CT	5	Pulse	No	4
1	4 120 41	4 120 43			5	RS 485	Yes	4

Pack	Cat.Nos	Pulse concentrator
1	4 120 65	For collecting and transmitting measurements taken by 12 universal pulse electricity meters. Also collects pulses from other meters (gas meters, water meters, etc.) RS485 output 4 modules

Pack	Cat.Nos	Measurement concentrator
1	4 120 00	Full or partial electricity metering for 5 uses: heating, cooling, domestic hot water, and power sockets + "other" 5 inputs for current transformers (up to 2 current transformers per input) 2 pulse inputs for water and gas metering LCD screen and 6-button keypad RJ45 IP output Power supply 110/230 VAC - 50/60 Hz 6 modules

Pack	Cat.Nos	Split core current transformer
1	4 120 02	90 A max. for the measurement concentrator Cat.No 4 120 00 Accepts : 10 x 1.5 mm <sup>2</sup> cables, or 7 x 2.5 mm <sup>2</sup> cables, or 2 x 6 mm <sup>2</sup> cables, or 1 x 10 or 16 mm <sup>2</sup> cable

Pack	Cat.Nos	Solid core current transformer
1	4 120 04	60 A, for the measurement concentrator Cat.No 4 120 00

<sup>1</sup>: One pulse type input for other types of meters (gas, water, etc.)

## EMDX<sup>3</sup> multi-function measuring units

┌ rail mounting



Technical characteristics p. 14

Conform to standards:  
- IEC 61557-12  
- IEC 62053-22  
- IEC 62053-23 class 1

Pack	Cat.Nos	EMDX <sup>3</sup> modular
1	4 120 45	<b>Multi-function measuring unit</b> For mounting on ┌ rail Width: 4 modules • LCD display • Precision class: 1 • Connection with current transformers (CT) • Measurement of currents, voltages, frequency, active, reactive and apparent power, power factor, active and reactive energy • THD voltages and currents • RS 485 and pulse output
1	4 120 51	<b>Multi-function measuring unit with active digital inputs and programmable alarms</b> For mounting on ┌ rail Width: 4 modules • LCD display • Precision class: 0.5 • Connection with current transformers (CT) • Measurement of currents, voltages, frequency, active, reactive and apparent power, power factor, active and reactive energy • 4 tariff metering: • THD voltages, currents and harmonic analysis up to order 25 (available on Modbus COM port) • Programmable alarms on all functions • RS 485 and pulse output

# EMDX<sup>3</sup> multi-function measuring units

for mounting on door or solid faceplate



Technical characteristics p. 14

Conform to standards:

- IEC 61557-12
- IEC 62053-22
- IEC 62053-23 class 1 for Cat.No 4 120 52 - Class 2 for Cat.No 4 120 53

Pack	Cat.Nos	EMDX <sup>3</sup> - Access multi-function measuring units
1	4 120 47	<b>Precision class: 1</b> For mounting on door or solid faceplate Dimensions: 96 x 96 x 62 mm • LCD display • Connection with current transformers (CT) • Measurement of currents, voltages, frequency, active, reactive and apparent power and power factor • Metering: - Active energy consumed or produced - Reactive energy consumed or produced • THD voltages and currents • RS 485 communication and Pulse output
1	4 120 52	<b>Precision class: 0.5</b> For mounting on door or solid faceplate Dimensions: 96 x 96 x 62 mm • LCD display • Measurement of currents, voltages, active, reactive and apparent power and power factor • Metering: - Active energy consumed or produced - Reactive energy consumed or produced - Operating time - Pulses • THD voltages, currents, and individual harmonic up to order 25 <sup>(1)</sup> • RS 485 communication and Pulse output
1	4 120 53	<b>EMDX<sup>3</sup> - Premium multi-function measuring unit</b> For mounting on door or solid faceplate Dimensions: 96 x 96 x 62 mm • LCD display • Precision class: 0.5 • Measurement of currents, voltages, active, reactive and apparent power, internal temperature and power factor • Metering: - Active energy consumed or produced - Reactive energy consumed or produced - Operating time - THD • Programmable alarms on all functions • Power quality functions: harmonics (U & I) to 40th, dips, swells, interruption, rapid voltage change and flickers • Memory embedded (8 Mb) • RTC (real time clock) Can take 4 EMDX <sup>3</sup> optional modules
<b>EMDX<sup>3</sup> modules</b>		
1	4 120 55	R485 communication module with Modbus link
1	4 120 59	Pulse output module for energy count 2 independent and insulated outputs
1	4 120 57	2 inputs / 2 outputs module Output can be assigned to alarms on different values
1	4 120 60	2 analog outputs module 0...20 mA and/or 4...20 mA
1	4 120 58	Temperature module 2 Pt100 inputs resistances

1: Available on Modbus COM port

# EMDX<sup>3</sup> Supervision system



Technical characteristics p. 14

Pack	Cat.Nos	Energy management software for 1 computer (user licence key)	
1	4 149 38	Allows remote configuration, test, control and visualization of data collected from EMDX <sup>3</sup> electrical energy meters and multi-function measuring units and CX <sup>3</sup> energy management system on one computer connected to the network 30-day free trial version available for download via E-Catalogue	
1	4 149 39	Software licence agreement (user key) for 32 Modbus addresses or 32 pulse modules	
1	4 149 39	Software licence agreement (user key) 255 Modbus addresses or 255 pulse modules	
<b>Energy management multi-support web servers</b>			
Allow remote configuration, test, control and visualization, via a web browser on PCs, smartphones, web viewers, tablet computers, of data collected from: protection devices (DX <sup>3</sup> add-on modules with integrated measurement control unit, DPX <sup>3</sup> and DMX <sup>3</sup> ), EMDX <sup>3</sup> electricity meters and multi-function measuring units, CX <sup>3</sup> energy management system and Green'up charging stations for electric vehicles.			
<b>rail mounting</b>			
Direct IP connection Power supply: 9 to 28 V = with the help of a single-phase switching mode power supply Cat.No 1 467 21 (p. 97) to be ordered separately			
1	4 149 47	For 10 Modbus addresses or 10 pulse modules	Number of modules: 4
1	4 149 48	For 32 Modbus addresses or 32 pulse modules	4
<b>Fixing on plate</b>			
1	4 149 49	For 255 Modbus addresses or 255 pulse modules Supplied with external power supply and fixing brackets	
<b>Communication interface</b>			
<b>RS485 / Ethernet</b>			
1	0 046 89	For RS 485 / Ethernet conversion (for connection to an IP network)	Number of modules: 3

Current transformers (CT)  
p. 12



# Measurement and display via e-communication

## selection table

PROTECTION DEVICES WITH INTEGRATED MEASUREMENT FUNCTION		
PROTECTION & MEASUREMENT		COMMUNICATION
DMX <sup>3</sup> with electronic protection unit 	+	DMX <sup>3</sup> communication option Cat.No 0 288 05 
DPX <sup>3</sup> with electronic release and energy metering central unit 	+	Communication interface Cat.No 4 210 75 (p. 11) 
DX <sup>3</sup> add-on module with integrated measurement unit 	+	Communication interface Cat.No 4 210 75 (p. 11) 

PROTECTION DEVICES IN ASSOCIATION WITH EDMX <sup>3</sup> MULTIFUNCTION MEASURING UNITS OR CX <sup>3</sup> EMS		
PROTECTION		MEASUREMENT & COMMUNICATION
DMX <sup>3</sup> with electronic protection unit 	+	EDMX <sup>3</sup> multifunction measuring units on rail (p. 8)  → RS 485 output 
DPX <sup>3</sup> with thermal magnetic or electronic release 		EDMX <sup>3</sup> multifunction measuring units on door (p. 9)  → RS 485 output 
DX <sup>3</sup> MCBs 		CX <sup>3</sup> EMS measurement modules + Communication interface Cat.No 4 149 40 

DISPLAY
RS 485/IP converter Cat.No 0 046 89 (p. 9) 
+
Door mounting touch screen Cat.No 0 261 56 
or
User licence key Cat.Nos. 4 149 38/39 (p. 9) for displaying on 1 PC only 
or
Energy management multi-support web servers (p. 9): - Cat.Nos 4 149 47/48 (direct IP connection) - Cat.No 4 149 49 + RS 485/IP converter Cat.No 0 046 89 (p. 9) for displaying on one or multiple PCs, tablets, smartphones 

# Power supervision system

remote control, monitoring and measurement



With the Legrand Power supervision system, circuit breakers are integrated in a supervision system. You can therefore check the status of the circuit breakers, measure the electrical values and control the circuit breakers remotely MODBUS protocol

Pack	Cat.Nos	RS485 Modbus communication interfaces	Pack	Cat.Nos	Accessories															
1	0 261 37	<b>DPX electronic interface</b> For reading information from an electronic DPX : phase 1, 2 and 3 currents, the currents in the neutral, the temperature (electronic card), the nominal current and the DPX settings Dimension: 2 modules Power supply: 24 V $\sim$ / $\equiv$ . RS 485 link (2-wire) Address, speed and coding can be modified with configurator kit	1	0 261 45	<b>Configurator kit</b> For configuring the DPX and DPX <sup>3</sup> I/O card and interface Kit with configurators 0 to 9 (10 configurators for each digit)															
1	4 210 75	<b>DPX<sup>3</sup> electronic interface</b> For connecting electronic DPX <sup>3</sup> (except DPX <sup>3</sup> 630 and 1600 S1 electronic releases) to an RS485 Modbus communication network All the information managed by the circuit breaker's electronic card will be shared on the Modbus network Dimension: 1 module Power supply: 24 V $\sim$ / $\equiv$ . RS 485 link (2-wire) Address, speed and coding can be modified with configurator kit	1	1 466 23	<b>Single phase stabilised power supply</b> For supplying communication devices Primary 115-230 V 24 V $\equiv$ <table border="1" style="margin-left: 20px;"> <tr> <td>Power (W)</td> <td>Current (A)</td> <td>Flexible cable terminal capacity</td> </tr> <tr> <td>120</td> <td>5</td> <td>Input (mm<sup>2</sup>)</td> </tr> <tr> <td></td> <td></td> <td>Output (mm<sup>2</sup>)</td> </tr> <tr> <td></td> <td></td> <td>6</td> </tr> <tr> <td></td> <td></td> <td>2 x 6</td> </tr> </table>	Power (W)	Current (A)	Flexible cable terminal capacity	120	5	Input (mm <sup>2</sup> )			Output (mm <sup>2</sup> )			6			2 x 6
Power (W)	Current (A)	Flexible cable terminal capacity																		
120	5	Input (mm <sup>2</sup> )																		
		Output (mm <sup>2</sup> )																		
		6																		
		2 x 6																		
1	0 288 05 <sup>1</sup>	<b>RS 485 Modbus communication option for DMX<sup>3</sup></b> Option making the DMX <sup>3</sup> capable of communicating for supervision	1	0 046 89	<b>IP converter</b> For RS 485/Ethernet conversion for connecting electricity meters and measurement control units to an IP network Supply voltage 90-260 V $\sim$ 80/60 HZ Dimension: 2 modules															
1	0 035 67	<b>Modular power supply</b> 230 V $\sim$ - 27 V $\equiv$ - 0.6 A 2 modules	1	4 149 38	<b>Energy management software for 1 computer (user licence key)</b> Allows remote configuration, test, control and visualization of data collected from EMDX <sup>3</sup> electrical energy meters and multi-function measuring units and CX <sup>3</sup> energy management system on one computer connected to the network 30-day free trial version available for download via E-Catalogue															
1	0 261 36	<b>DPX and DX<sup>3</sup> signalling and control interface</b> Signalling and control interface between the power supervision system and the thermal magnetic and electronic circuit breakers. Equipped with analogue / digital inputs and relay outputs. Can handle multiple circuit breakers. - 24 inputs for collecting information from the signalling auxiliaries on the DPX and DX <sup>3</sup> circuit breakers: auxiliary contact NO position (1 input) or NO+NC position (2 inputs), fault signal (1 input) - 6 outputs for: the remote control of the motor driven circuit breakers (2 outputs) and for tripping the circuit breakers for testing purposes (1 output) Dimension: 6 modules Power supply: 24 V $\sim$ / $\equiv$ RS 485 link (2-wire) Address, speed and coding can be modified with configuration kit.	1	4 149 39	Software licence agreement (user key) for 32 Modbus addresses or 32 pulse modules Software licence agreement (user key) 255 Modbus addresses or 255 pulse modules															
		1: Factory fitted			<b>Energy management multi-support web servers</b> Allow remote configuration, test, control and visualization, via a web browser on PCs, smartphones, web viewers, tablet computers, of data collected from: protection devices (DX <sup>3</sup> add-on modules with integrated measurement control unit, DPX <sup>3</sup> and DMX <sup>3</sup> ), EMDX <sup>3</sup> electricity meters and multi-function measuring units, CX <sup>3</sup> energy management system and Green'up charging stations for electric vehicles.															
					<b>rail mounting</b> Direct IP connection Power supply: 9 to 28 V $\equiv$ with the help of a single-phase switching mode power supply Cat.No 1 467 21 (p. 97) to be ordered separately															
			1	4 149 47	For 10 Modbus addresses or 10 pulse modules															
			1	4 149 48	For 32 Modbus addresses or 32 pulse modules															
			1	4 149 49	<b>Fixing on plate</b> For 255 Modbus addresses or 255 pulse modules Supplied with external power supply and fixing brackets															

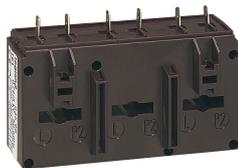
EMDX<sup>3</sup> measurement control units  
p. 8



## Current transformers (CT)



4 121 42



4 121 58



4 121 62

Technical characteristics [see e-catalogue](#)

Pack	Cat.Nos	<b>Single-phase solid core current transformers</b>	
		Used with ammeters, electricity meters or multi-function measuring units Current at the secondary: 5 A Can be fixed on plate, EN 60715 rail Cat.No 4 121 01/02/03/04/05/06/07, or bars Secondary connected by terminals or lugs Precision class: 0,5 % (1 % for Cat.No 4 121 01/02)	
		<b>For 16 x 12,5 mm bar or Ø21 mm cable</b>	
		Transformation ratio	Output (VA)
1	4 121 01	50/5	1,25
1	4 121 02	75/5	1,5
1	4 121 03	100/5	2
1	4 121 04	125/5	2,5
1	4 121 05	160/5	3
1	4 121 06	200/5	4
1	4 121 07	250/5	5
		<b>For 32,5 x 10,5 and 25,5 x 15,5 mm bars or Ø27 mm cable</b>	
1	4 121 12	400/5	10
1	4 121 14	600/5	12
		<b>For 40,5 x 12,5 and 32,5 x 15,5 mm bars or Ø26 mm cable</b>	
1	4 121 16	250/5	3
1	4 121 17	400/5	6
1	4 121 19	700/5	8
		<b>For 40,5 x 10,5, 32,5 x 20,5 and 25,5 x 25,5 mm bars or Ø32 mm cable</b>	
1	4 121 23	250/5	3
1	4 121 24	300/5	5
1	4 121 25	400/5	8
1	4 121 26	600/5	12
		<b>For 50,5 x 12,5 and 40,5 x 20,5 mm bars or Ø40 mm cable</b>	
1	4 121 31	700/5	8
1	4 121 32	800/5	8
1	4 121 33	1000/5	10
		<b>For 65 x 32 mm bar</b>	
1	4 121 36	600/5	8
1	4 121 38	800/5	12
1	4 121 39	1000/5	15
		<b>For 84 x 34 mm bar</b>	
1	4 121 42	1250/5	12
		<b>For 127 x 38 mm bar</b>	
1	4 121 46	1600/5	10
1	4 121 47	2000/5	15
1	4 121 49	3200/5	25
		<b>For 127 x 54 mm bar</b>	
1	4 121 50	1600/5	20
1	4 121 51	2000/5	25
1	4 121 52	2500/5	30
1	4 121 53	3200/5	30
1	4 121 54	4000/5	30

Pack	Cat.Nos	<b>Three-phase solid core current transformers</b>	
		Used with ammeters, electricity meters or multi-function measuring units Current at the secondary: 5 A For fixing directly on bars Secondary connected by terminals or lugs Precision class: 1 %	
		<b>For three 20,5 x 5,5 mm bars</b>	
1	4 121 57	Transformation ratio 250/5	Output (VA) 3
		<b>For three 30,5 x 5,5 mm bars</b>	
1	4 121 58	400/5	4

Pack	Cat.Nos	<b>Single-phase split-core current transformers</b>	
		Used with ammeters, electricity meters or multi-function measuring units Current at the secondary: 5 A For fixing directly on bars Secondary connected by terminals or lugs Precision class: 0,5 %	
		<b>For 50 x 80 mm bar</b>	
		Transformation ratio	Output (VA)
1	4 121 62	400/5	1,5
1	4 121 63	750/5	3
		<b>For 80 x 120 mm bar</b>	
1	4 121 64	1000/5	5
1	4 121 65	1500/5	8
		<b>For 80 x 160 mm bar</b>	
1	4 121 66	2000/5	15
1	4 121 67	2500/5	15
1	4 121 68	3000/5	20
1	4 121 69	4000/5	20

Pack	Cat.Nos	<b>Viking 3 disconnecter block for measurement - 1 connection</b>			
		With its accessories, allows intervention (measurement, maintenance, etc) on a current, voltage and power measuring circuit by keeping the current transformer secondary circuit closed			
		Colour	Nominal cross section (mm <sup>2</sup> )	Capacity	Pitch (mm <sup>2</sup> )
				Rigid wire (mm <sup>2</sup> )	Flexible wire (mm <sup>2</sup> )
25	0 371 92	Grey	4	0.25 to 4	0.25 to 4
					8

# EMDX<sup>3</sup> electrical energy meters

└ rail mounting

## Technical characteristics

Conform to IEC 61557-12

Active energy accuracy: Class 1 (EN 62053-21)  
Class B (EN 50470-1,3) - for MID version

Reactive energy accuracy: Class 2 (EN 62053-23)

### Single-phase meters:

Reference voltage  $U_n$ : 230 V-240 V  
Reference frequency: 50-60 Hz

### Cat.Nos 0 046 70, 4 120 68/69

LCD display: 7 digits  
Resolution: 0.1 kWh  
Maximum indication: 99999.9 kWh

### Cat.Nos 4 120 80/81/82/83

LCD graphic display: 9 digits  
Resolution: 0.01 kWh  
Maximum indication: 9999999.99 kWh

## Three-phase meters:

Reference voltage  $U_n$ : single phase 230 V-240 V  
three-phase 230 (400) - 240 (415) V

Reference frequency: 50-60 Hz

### Cat.Nos 4 120 40/41/42/43/91/92/93

LCD graphic display: 9 digits  
Resolution: 0.01 kWh  
Maximum indication: 9999999.99 kWh

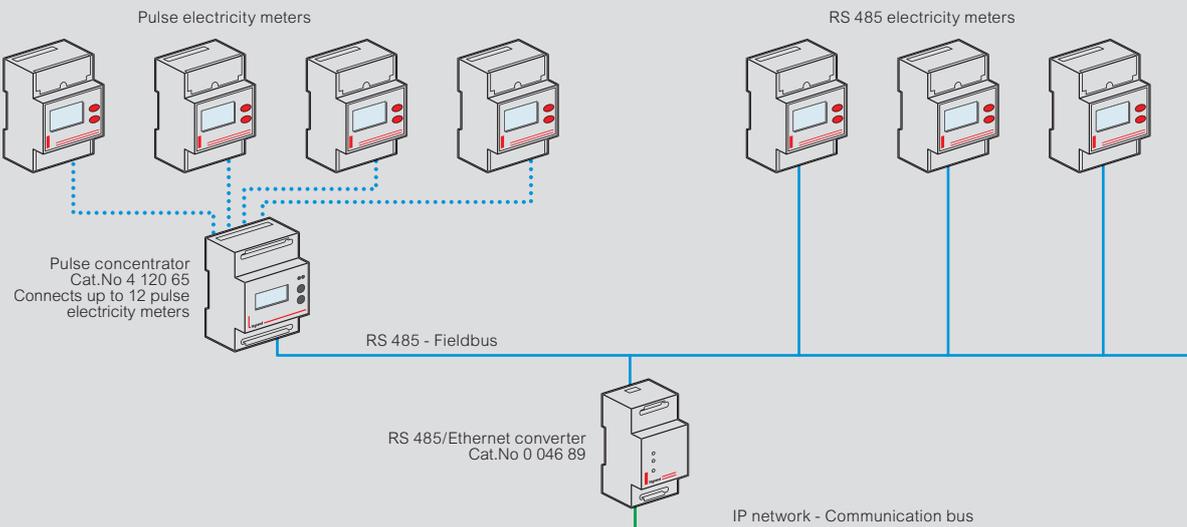
### Cat.Nos 4 120 74/75

LCD display: 8 digits  
Resolution: 0.01 kWh  
Maximum indication: 999999.99 kWh

Cat.Nos		0 046 70	4 120 68	4 120 69	4 120 80	4 120 81	4 120 82	4 120 83	4 120 90	4 120 91	4 120 92	4 120 93	4 120 74	4 120 75	4 120 40	4 120 41	4 120 42	4 120 43			
Type		Single phase								Three-phase											
Connection		Direct connection																Connection via CT			
Number of modules		1	1	1	2	2	2	2	4	4	4	4	6	6	4	4	4	4			
Max. current (A)		32	45	45	63	63	63	63	63	63	63	63	125	125	5 (CT)	5 (CT)	5 (CT)	5 (CT)			
Metering and measurement	Energy	Total active energy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
		Total reactive energy		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Partial active energy (reset)				●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Partial reactive energy (reset)				●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Energy bidirectional measure	Ea + and Ea-by tariff				●	●	●	●	●	●	●	●			●	●	●	●		
		Active power		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Power	Reactive power		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Apparent power		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Average active power		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Max. average active power value				●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Electrical values	Current		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Voltage		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Frequency				●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Power factor		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Dual tariff					●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Pulse input					●	○	●	○	●	○	●	○			●	○	●	○			
Connection diagnostic															●	●	●	●			
Time of uses	Total				●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	By tariff				●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Communication	Pulse output	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	Modbus RS 485		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Certification				●		●		●		●		●		●		●		●			

● Built-in function  
○ Dual tariff or pulse input

## Interfacing with IP communication network



For direct connection meters, if connected via transformers, the resolution and maximum indication depend on the transformation ratios of these transformers

# EMDX<sup>3</sup> multi-function measuring units

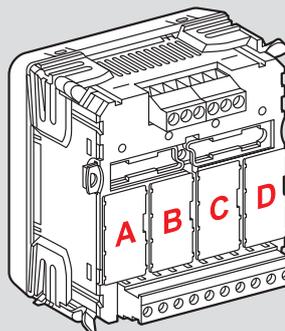
## Technical characteristics

Cat.Nos			4 120 45	4 120 47	4 120 51	4 120 52	4 120 53
Connection	Current measurement terminals	Flexible cable	4 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>
		Rigid cable	6 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>
	Other terminals	Flexible cable	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
Protection index	Front cover		IP 54	IP 54	IP 54	IP 54	IP 54
	Casing		IP 20	IP 20	IP 20	IP 20	IP 20
Weight			250 g	285 g	250 g	285 g	285 g
Display	Type		Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD
	Refresh time		1.1 s	1.1 s	1 s	1 s	1 s
Measurements			1P+N, 3R 3P+N	1P+N, 3R 3P+N	1P+N, 3R 3P+N	1P+N, 3R 3P+N	1P+N, 3R 3P+N
		Phase/Phase					
Voltage measurement	Direct	Phase/Neutral	80 - 500 V	50 - 460 V	80 - 500 V	80 - 500 V	80 - 690 V
		Primary	-	-	max. 1200 V	max. 1200 V	max. 150 kV
	From PT						
	Secondary						
Update period	Direct		0.8 s	0.3 s	0.2 s	0.2 s	0.2 s
	From a CT						
Current measurement	Primary	50 kA	50 kA	50 kA	max. 10 kA (X/1 A) or 50 kA (X/5A)	max. 10 kA (X/1 A) or 50 kA (X/5A)	max. 10 kA (X/1 A) or 50 kA (X/5A)
		Secondary	5 A	5 A	1 A or 5 A	1 A or 5 A	1 A or 5 A
	Minimum measurement	10 mA	10 mA	5 mA	5 mA	5 mA	
	Input consumption	≤ 1 VA	≤ 1 VA	≤ 1 VA	≤ 1 VA	≤ 0.2 VA	
	Permanent overload	1.2 In	1.2 In	1.2 In	1.2 In	1.2 In	
	Intermittent overload	20 In / 0.5 s	20 In / 0.5 s	20 In / 0.5 s	20 In / 0.5 s	20 In / 0.5 s	
	Update period	0.2s	0.2s	0.2s	0.2s	0.2s	
Max. CT x PT ratio		9999	9999	99990	99990	10000000 (x/1 A) 2000000 (x/5 A)	
Power measurement	Total		0 - 9999 kW/ kVA / kVA	0 - 9999 kW/ kVA / kVA	0 - 9999 kW/ kVA / kVA 0 - 9999 MW / MVA / MVA	0 - 9999 kW/ kVA / kVA 0 - 9999 MW / MVA / MVA	0 - 9999 kW/ kVA / kVA 0 - 9999 MW / MVA / MVA
	Update period		0.2 s	0.2 s	0.2 s	0.2 s	0.2 s
Frequency measurement	Measurement range		45/65 Hz	45/65 Hz	45/65 Hz - 360/440 Hz	45/65 Hz - 360/440 Hz	45/65 Hz
	Update period		0.2 s	0.2 s	0.2 s	0.2 s	0.2 s
Auxiliary power supply	50 / 60 Hz		230 V ± 10%	Self-supplied	80 - 265 V ± 10%	80 - 265 V ± 10%	80 - 265 V ± 10%
	d.c.		-	-	100 - 300 V ± 10%	100 - 300 V ± 10%	100 - 300 V ± 10%
	Consumption	a.c.	≤ 2.5 VA	≤ 2.5 VA	≤ 2.5 VA	≤ 2.5 VA	≤ 2.5 VA
	d.c.	-	-	≤ 2.5 W	≤ 3.5 W	≤ 3.5 W	
Operating temperature			from - 5° C to + 55° C	from - 5° C to + 55° C	from - 5° C to + 55° C	from - 5° C to + 55° C	from - 5° C to + 55° C
Storage temperature			from - 25° C to + 70° C	from - 25° C to + 70° C	from - 25° C to + 70° C	from - 25° C to + 70° C	from - 25° C to + 70° C

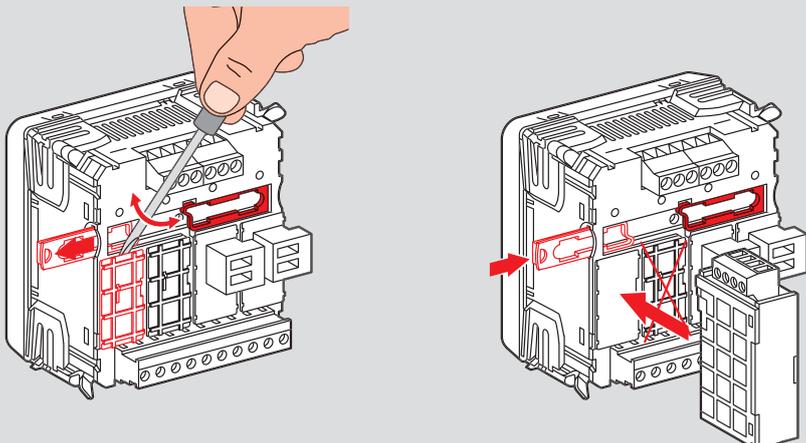
1: except for Cat.No 4 120 53 - 50 Hz only

## Maximum number of modules and installing position for multi-function measuring unit Cat.No 4 120 53

Cat.Nos	Designation	Max. number	EMDX <sup>3</sup> -Premium 4 120 53
4 120 55	RS 485 communication module	1	A
4 120 57	2 inputs / 2 outputs module	2	C, D
4 120 58	Temperature module	1	D
4 120 59	Pulse output module for energy count	2	A, B, C, D
4 120 60	2 analog outputs module	2	C, D

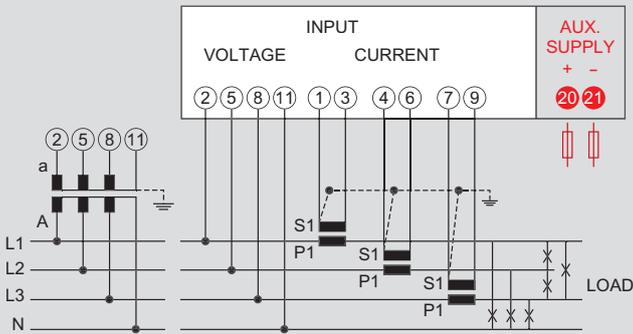


## Fitting modules Cat.Nos 4 120 53

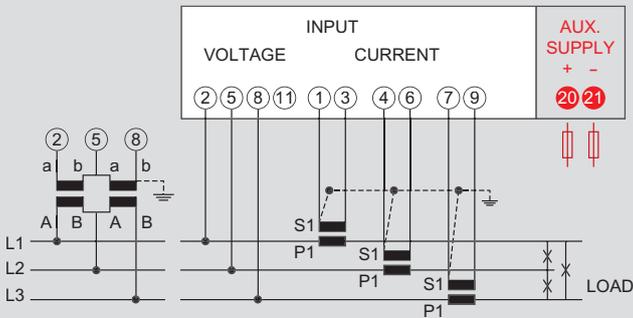


## Connection solutions

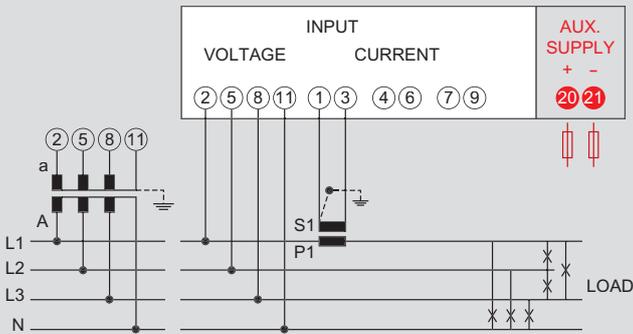
### Unbalanced three-phase network (4-wire)



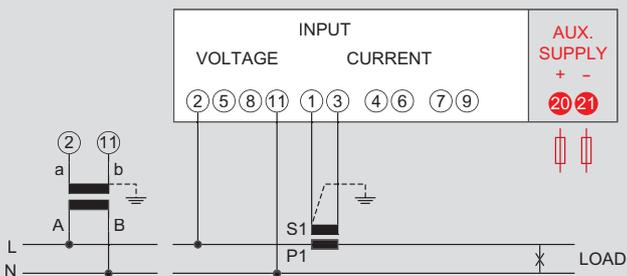
### (3-wire)



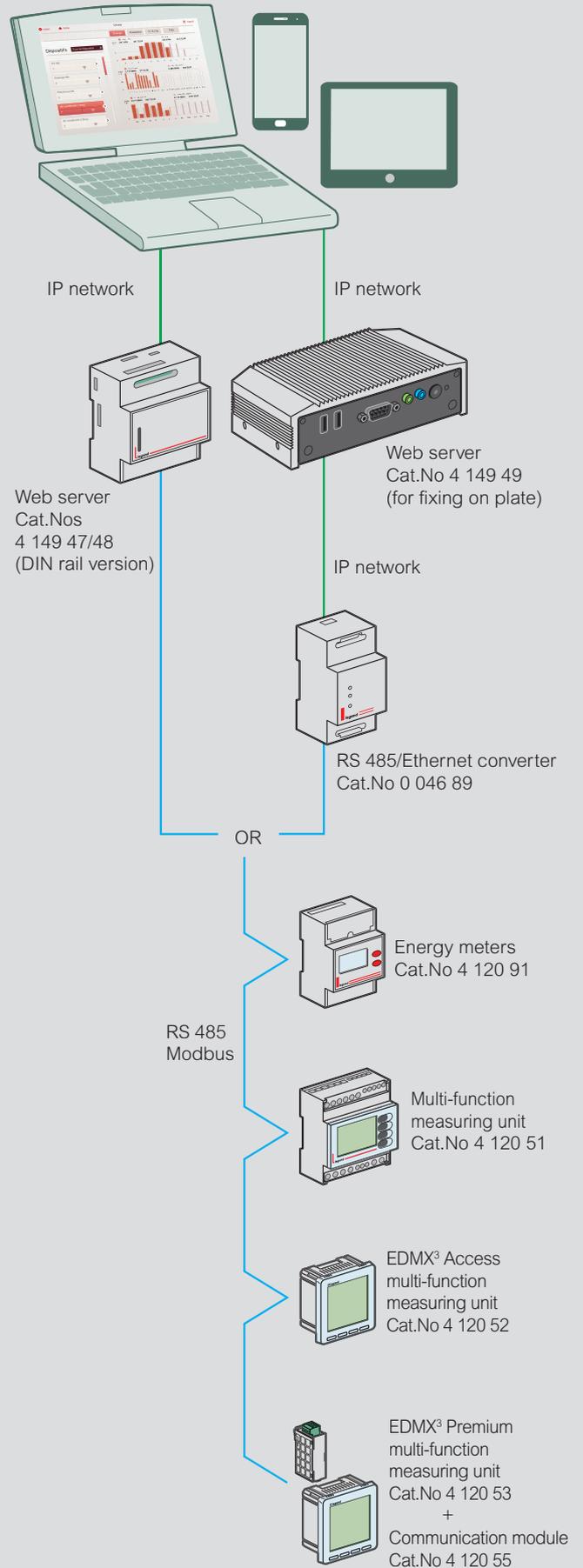
### Balanced three-phase network (3-wire)



### Single-phase network (2-wire)



## Wiring example of communication network





0 046 02



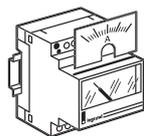
0 046 00



0 046 63

Dimensions **see e-catalogue**

Pack	Cat.Nos	Analogue metering devices	
		<b>Ammeters</b>	
		Measure the intensity in Amperes (A) of the current circulating in an electrical circuit	Number of modules
1	0 046 02	Direct connection AC or DC Scale: 0 - 30 A - supplied with dial	4
1	0 046 00	Connected via a 0 - 5 A output current transformer (CT)	4
		<b>Measuring dials for ammeter Cat.No 0 046 00</b>	
2	0 046 10	0-50 A	
2	0 046 13	0-100 A	
2	0 046 15	0-200 A	
2	0 046 16	0-250 A	
2	0 046 17	0-300 A	
2	0 046 18	0-400 A	
2	0 046 20	0-600 A	
2	0 046 21	0-800 A	
2	0 046 22	0-1000 A	
2	0 046 66	0-1250 A	
2	0 046 24	0-1500 A	
2	0 046 25	0-2000 A	
		<b>Voltmeter</b>	
		Measure the AC or DC voltage in a circuit in volts (V)	Number of modules
1	0 046 60	Scale: 0-500 V	4
		<b>Digital ammeter / voltmeter</b>	
		- Ammeter mode: connected via a 0 - 5 A current transformer (CT) Reading range adjusted according to CT used	Number of modules
1	0 046 63	- Voltmeter mode: measures the AC or DC voltage of an electrical circuit; scale 0 - 600 V Voltage: 230 V $\sim$ - 50/60 Hz Reading: I - 0 to 8000 A U - 0 to 500 V	4



Pack	Cat.Nos	Selective measurement switches	
		For manual selection of the circuits to be measured	
		<b>Ammeter cam switch</b>	
		For measuring the current in a circuit with one ammeter, connected via a current transformer (CT)	Number of modules
1	0 046 50	3-phase, 4-position cam switch	3
		<b>Voltmeter cam switches</b>	
		For measuring the voltages in a circuit with one voltmeter	Number of modules
1	0 046 52	3-phase, 4-position cam switch	3
1	0 046 53	3-phase with neutral, 7-position cam switch	3
		<b>Digital frequency meter</b>	
		For measuring the frequency of a 230 V $\sim$ electrical circuit in hertz (Hz) Supply voltage 230 V $\sim$ (connected to circuit to be measured)	Number of modules
1	0 046 64	Green LED 3 digit display - 40-80 Hz display	4
		<b>Totalising hour counters</b>	
		Count the operating hours of a machine or an electrical device to determine its exact operating time Counter with numerical display Capacity: 5 digits + 2 decimal places (1 unit = 1 hour) Precision: 1/100th hour Consumption: 0.2 VA	Number of modules
1	0 046 94	230 V $\sim$ - 50 Hz	2
1	0 046 91	24 V $\sim$ - 50 Hz	2



## Electrical energy metering on door



Ammeters, voltmeters, totalising, can be mounted on XL<sup>3</sup> 800 and XL<sup>3</sup> 4000 curved doors

Pack	Cat.Nos	Analogue metering devices
		<b>Ammeters</b>
		Measure the intensity in amperes (A) of the current Connected via a 0 - 5 A output current transformer (CT)
		To be fitted with a measuring dial appropriate for the current to be measured
1	0 146 00	Round barrel Ø56 mm
1	0 146 01	Square barrel 68 x 68 mm
		<b>Measuring dial for ammeters</b>
		Supplied by set of 2 (1 for round barrel, 1 for square barrel)
1	0 146 10	0 - 50 A
1	0 146 13	0 - 100 A
1	0 146 15	0 - 200 A
1	0 146 16	0 - 250 A
1	0 146 17	0 - 300 A
1	0 146 18	0 - 400 A
1	0 146 20	0 - 600 A
1	0 146 21	0 - 800 A
1	0 146 22	0 - 1000 A
1	0 146 66	0 - 1250 A
1	0 146 24	0 - 1500 A
1	0 146 25	0 - 2000 A
1	0 146 26	0 - 2500 A
1	0 146 28	0 - 4000 A
		<b>Voltmeters</b>
		Measure the voltage in volts (V) AC ou DC
		Scale: 0 - 500 V
1	0 146 60	Round barrel Ø56 mm
1	0 146 61	Square barrel 68 x 68 mm
		<b>Totalising hour counters (48 x 48)</b>
		One-piece device - IP 40
		Front mounting on enclosure or cabinet doors
		Synchronous motor operation (operation indicator)
		For counting the operating hours of an electrical machine or device, with no reset
		Supplied with cover frame (55 x 55 mm) (for round cut-out) and fixing accessories
		Connection: 2 x 1.5 mm <sup>2</sup>
1	0 495 52	24 V~ - 50 Hz
1	0 495 53	110 to 120 V~ - 50 Hz
1	0 495 54	110 to 120 V~ - 60 Hz
1	0 495 55	200 to 240 V~ - 50 Hz
1	0 495 58	48 V~ - 50 Hz
1	0 495 59	400 V~ - 50 Hz
1	0 495 60	12 to 36 V <sub>DC</sub>
100	0 495 97	Frame 55 x 55 mm

## Electrical energy metering

### Metering devices on rail

#### Technical characteristics

##### Analogue ammeters

Type of measurement	Analogue	
	Ferromagnetic	
Frequency	50 to 60 Hz	
Precision	1.5 %	
Operating temperature	- 10 °C to + 40 °C	
Storage temperature	- 20 °C to + 80 °C	
Consumption:		
• voltage circuit	-	
• measurement circuit	1.1 VA	
Connection capacity	Direct 6 mm <sup>2</sup>	Par TI 4 mm <sup>2</sup>
Conformity to standards	NF EN 61010-1	

##### Analogue Voltmeters

Type of measurement	Analogue	
	Ferromagnetic integration	
Frequency	50 to 60 Hz	
Precision	1.5 %	
Operating temperature	- 10 °C to + 40 °C	
Storage temperature	- 20 °C to + 80 °C	
Consumption	3 VA	
Connection capacity	2 x 2.5 mm <sup>2</sup>	
Conformity to standards	NF EN 61010-1	

##### Digital frequency meter

Type of measurement	Quartz electronic
Precision	± 0.2 % for ± 1 digit
Operating temperature	- 10 °C to + 40 °C
Storage temperature	- 20 °C to + 70 °C
Consumption	4.5 VA
Connection capacity	2 x 2.5 mm <sup>2</sup>
Conformity to standards	NF EN 61010-1

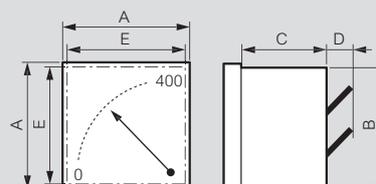
### Analogue metering devices on door

#### Technical characteristics

Frequency: 50/60 Hz  
Precision class: 1.5 %  
Operating temperature: - 10 °C to + 40 °C  
Storage temperature: - 20 °C to + 80 °C  
Consumption:  
- ammeter: 1.1 VA  
- voltmeter: 3 VA  
Connection capacity: 2 x 2.5 mm<sup>2</sup> with screws or  
Conform to IEC 60051, VDE 0410, BS 89,  
EN 60051-1, cenelec HD 223

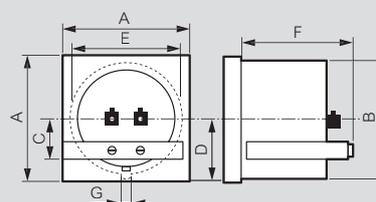
#### Dimensions

Cat.Nos 0 146 01/61



Dimensions (mm)				
A	B	C	D	E
72	66.5	44	12	68±0,7

Cat.Nos 0 146 00/60



Dimensions (mm)						
A	B	C	D	E	F	G
72	Ø55	21.4	28.5	56	46	3.2



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