

# Control your energy consumption at any time



kWh  
kVAR  
€



MEASUREMENT, METERING & DISPLAY VIA  
**E.COMMUNICATION**

# Measure, meter, display, control your energy consumption wherever you are

## Why measure?

Measurement is the basis of all diagnostics. By monitoring your consumption, you can make savings of 8 to 12%. And by combining this with action plans, you can optimise performance and commit to a sustainable development process. Energy efficiency requirements in

commercial buildings will encourage the use of measurement, by load type, in each consumer unit with display of consumption as close as possible to the user (for example: heating, cooling, hot water production, lighting, power outlets).

### Legrand solutions

Beyond electricity meters, multi-function measuring units and the new DPX<sup>3</sup> circuit breakers incorporating measurement functions, Legrand has developed an **e.communication** infrastructure for displaying energy consumption information, details of disturbance on the system, harmonic distortion, etc. according to the type of building (new or refurbished).



Installation of 3 electricity meters and 1 multi-function measuring combined with corrective actions

Potential savings for a set of electrically heated offices 600 m<sup>2</sup>

**ANNUAL SAVING**

**800 €**

► Payback 22 months max.<sup>(1)</sup>

**ANNUAL SAVING**

**1300 kg CO<sub>2</sub> equivalent**

CO<sub>2</sub> equivalent of all polluting gases (CO<sub>2</sub>, methane, carbon monoxide, fluorinated gases, etc.)

(1) Prices and data for information only, valid in France.

**DISPLAY INSIDE THE CONSUMER UNIT**



**DISPLAY ON THE CONSUMER UNIT**



**DISPLAY AS CLOSE AS POSSIBLE TO THE USERS**



iPad, Archos, etc. type tablet computer equipped with a web browser

**E•measurement on the wall**

Display of the measurement on a screen connected to the IP network with modular server, displaying data from multi-function measuring units and EMDX<sup>3</sup> electricity meters.

**DISPLAY CENTRALLY AND REMOTELY**



The measurement is displayed, via the dedicated software, on a PC connected to the network.

**E•measurement on a screen**

Remote display, for a set of buildings, of the measurement information from various main LV distribution boards or secondary boards. One IP address per consumer unit. Used for the real-time display, measurement and recording of consumption.

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

## A range tailored to your measurement, metering and display requirements

### High precision devices with complete communication functions

Thanks to the new range you can:

- Analyze energy consumption and reduce your electrical bill
- Find weak points and unsymmetrical loads in customer networks
- Check the quality of supplied energy and document this
- Create a measuring network for a complete installation
- Create a cost monitoring for different consumers

#### EMDX<sup>3</sup> overview



**046 75**  
With pulse transmitter



**046 76**  
With RS 485 communication interface



**146 68**  
Access



**146 69**  
Premium

	046 75 With pulse transmitter	046 76 With RS 485 communication interface	146 68 Access	146 69 Premium
Temperature storage module				●
Ethernet module				●
Individual Harmonics 63 <sup>rd</sup>				●
Harmonics 51 <sup>rd</sup>			●	●
Communication RS 485		●	●	●
Communication pulse	●	●	●	
Double tarif	●	●		
U, V, I, Energy, THD, Demand,	●	●	●	●
Custom Alarms	●	●	●	●

## EMDX<sup>3</sup> main functions



**046 75**  
With pulse transmitter



**046 76**  
With RS 485 communication interface



**146 68**  
Access



**146 69**  
Premium

MEASURING

METERING

	046 75 With pulse transmitter	046 76 With RS 485 communication interface	146 68 Access	146 69 Premium
Current	Instantaneous	●	●	●
	Maximum	●	●	●
	Average			●
Instantaneous Voltage	●	●	●	●
Frequency	●	●	●	●
Power	Instantaneous	●	●	●
	Average			●
	Max,Min	●	●	●
	Predictive			●
Power factor (instantaneous)	●	●	●	●
Temperature	Internal	●	●	●
	External (with plug-in module and sensors)			●
Active energy	●	●	●	●
Reactive energy	●	●	●	●
Apparent energy				●
Hours run	●	●	●	●
Harmonic distortion	●	●	●	●
Harmonics current	●	●	●	●
Phase to neutral voltage	●	●	●	●
Phase to phase voltage	●	●	●	●
Harmonics current individual				●
Phase to neutral voltage				●
Phase to phase voltage				●

# EMDX<sup>3</sup>

## multi-function measuring units with numerous functions

### EMDX<sup>3</sup> units on DIN rails



### EMDX<sup>3</sup> - Access units on doors



1- Backlit LCD display

**Keypad with 4 dual function keys:**

- 2- Currents (instantaneous and max. values), current harmonic distortion rate and wiring correction set-up
- 3- Voltages, frequency and voltage harmonic distortion rate
- 4- Active, reactive and apparent power (instantaneous and max. values) and power factor
- 5- Energy consumption and hour meter
- 6- Currents, temperatures and CT wiring correction set-up

1- Backlit LCD display

**Keypad with 4 dual function keys:**

- 2- Currents (instantaneous and max. values), current harmonic distortion rate and wiring correction set-up
- 3- Voltages, frequency and voltage harmonic distortion rate
- 4- Active, reactive and apparent power (instantaneous and max. values) and power factor
- 5- Energy consumption and hour meter



## EMDX<sup>3</sup> - Premium units on door

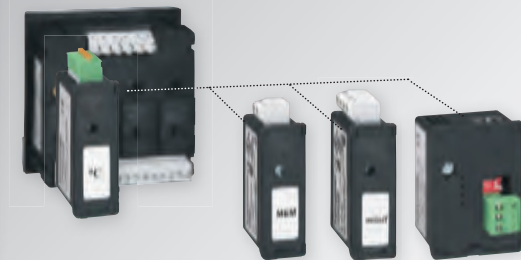


1- Backlit LCD display

**Keypad with 6 dual function keys:**

- 2- Currents (instantaneous values), and temperature
- 3- Voltages and frequency
- 4- Active, reactive and apparent power (instantaneous and predicted values) and power factor
- 5 - Maximum and average values for current, voltage, active, reactive apparent power
- 6- Current and voltage harmonic distortion rates
- 7- Energy consumption and hour meter

### INSTALLATION OF COMMUNICATING MODULES ON THE MULTI-FUNCTION MEASURING UNIT



The EMDX<sup>3</sup> Access and Premium multi-function measuring units can be equipped with EMDX<sup>3</sup> modules. They connect to the back of the unit and are used to compose and combine several functions (RS 485 communication, Ethernet, storage, temperature, etc.)

### CONNECTION OF MULTI-FUNCTION MEASURING UNITS OR METERS ABOVE 63 A IS MADE VIA CURRENT TRANSFORMERS (CT)

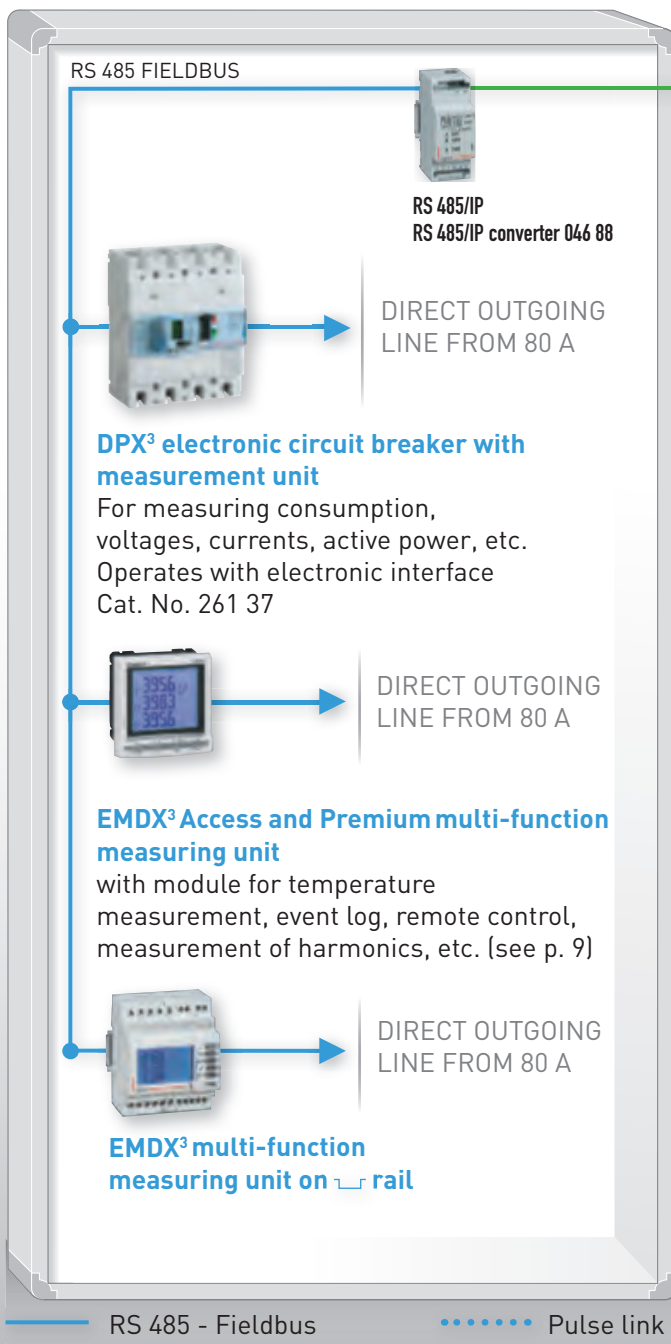
The EMDX<sup>3</sup> measurement control units and electricity meters connect to current transformers (CT) on cables or busbars, thus adapting to all consumer unit configurations.

# e.communication:

# Each consumer unit has an IP address

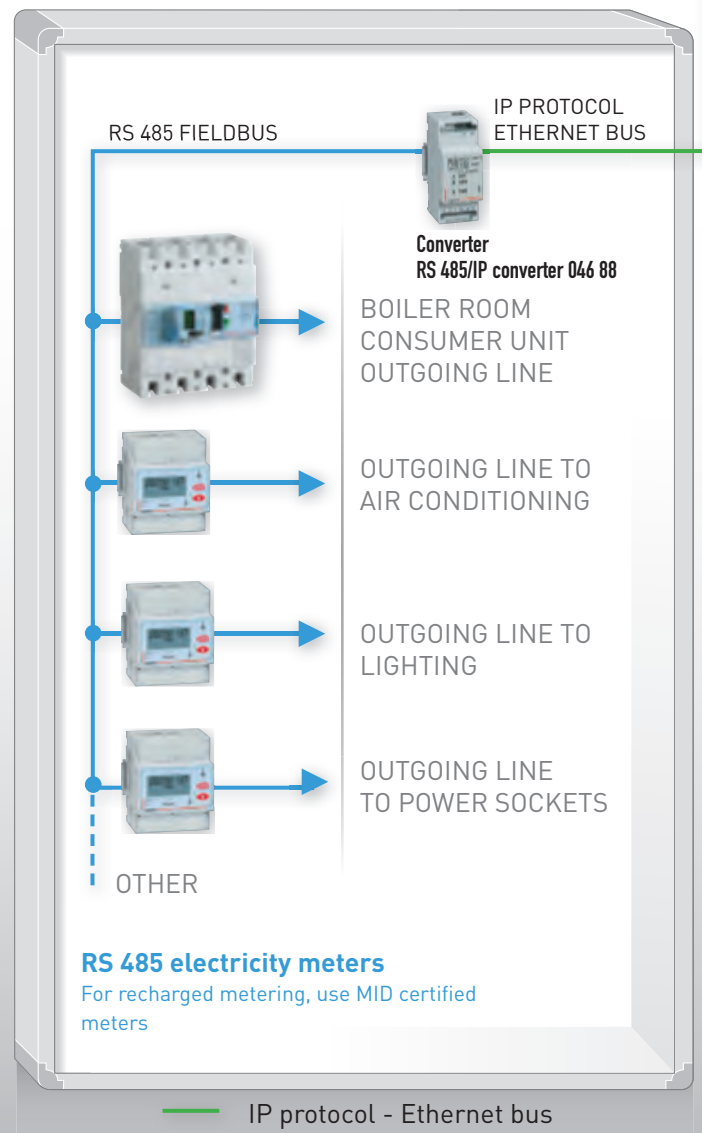
## Main LV distribution board

Measurement on each direct outgoing line



## Secondary board

Essential measurements







**Supervision software**  
Cat.No 900 028

For customised display of the values collected and control of the power installation on a PC

**IP GLOBAL CONTROL**



**e.communication**

At each outgoing line, display, measurement of harmonics, events history, etc.



**Web server** Cat.Nos 261 78/79

Enables consumption to be displayed on all types of screen equipped with a web browser (PC, smartphone, TV, type tablet computer, such as iPad, Archos, etc.)

**GLOBAL IP DISPLAY FROM A MODULAR SERVER**



iPad, Archos, etc. type tablet computer equipped with a web browser

**e.communication**

Consumption per use of the yellow/blue tariff consumer unit are displayed, via the modular server, on any type of screen (PC, smartphone, TV, tablet computer, etc.) connected to the network, to supervise all the parameters of the installation: consumption, harmonics, voltages, etc.

AVAILABLE IN JUNE 2011



**Software dedicated to measurement**

Cat.Nos 261 88/89

For displaying measurement or metering on a PC.

**IP DISPLAY WITH FREE SOFTWARE**

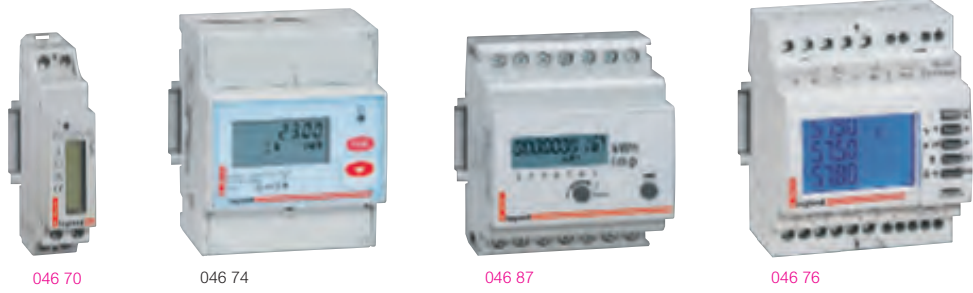


**e.communication**

Values from electricity meters or multi-function measuring units (consumption, harmonics, voltages, etc.) are displayed, via the dedicated software, on a PC connected to the network.

# EMDX<sup>3</sup>: electrical energy meters EMDX<sup>3</sup>: multi-function measuring units

└ rail mounting └ rail mounting



Technical characteristics **p. 11**

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 62053-21/23, IEC 62053-21/23 and IEC 61010-1. MID compliance ensures accuracy of the metering with a view to recharging for the electricity used.

Pack	Cat.Nos		<b>Single-phase meters</b>
	Non-MID	MID compliant	
1	<b>046 70</b>		<b>Direct connection</b> 32 A - 1 module Pulse output
1	046 81		36 A - 2 modules Pulse output
1	046 72	<b>046 78</b>	63 A - 2 modules Pulse output
1	<b>046 77</b>	<b>046 79</b>	63 A - 2 modules RS 485 output

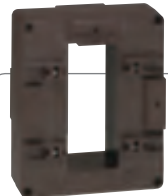
Pack	Cat.Nos		<b>Three-phase meters</b>
	Non-MID	MID compliant	
1	046 73	<b>046 82</b>	<b>Direct connection</b> 63 A - 4 modules Pulse output
1	<b>046 80</b>	<b>046 83</b>	63 A - 4 modules RS 485 output
1	046 74	<b>046 85</b>	<b>Connection with CT</b> 5 A - 4 modules pulse output
1	<b>046 84</b>	<b>046 86</b>	5 A - 4 modules RS 485 and pulse output

Pack	Cat.Nos	<b>Concentrator</b>
1	<b>046 87</b>	For collecting and transmitting measurements taken by 7 universal pulse electricity meters. Also collects data from other meters (gas meters, water meters, etc.) RS485 output


Technical characteristics **p. 12**

Conform to standards:  
- IEC 61557-12  
- IEC 62053-22 class 0.5 S  
- IEC 62053-23 class 2

Pack	Cat.Nos	<b>EMDX<sup>3</sup> modular</b>
		For mounting on └ rail Width: 4 modules • LCD display • Measurement of currents, voltages, active, reactive and apparent power and internal temperature • Dual tariff metering: - Active energy consumed - Reactive energy consumed - Operating time - Power factor • THD voltages and currents up to order 51 • Programmable alarms on all functions • Outputs for controlling wiring devices, alarm feedback and pulse feedback
1	<b>046 75</b>	<b>EMDX<sup>3</sup> pulse unit</b> Data transmission via pulses
1	<b>046 76</b>	<b>EMDX<sup>3</sup> RS 485 unit</b> Data transmission via RS 485 communication interface and pulses



Current transformers (CT)  
from 50/5 to 4000/5  
**See p. 10**



## EMDX<sup>3</sup>: multi-function measuring units for mounting on door or solid faceplate



146 68



146 69



146 73



146 78



Technical characteristics p. 12

Conform to standards:

- IEC 61557-12
- IEC 62053-22 class 0.5 S
- IEC 62053-23 class 2

Pack	Cat.Nos	EMDX <sup>3</sup> - Access
1	146 68	<b>Multi-function measuring unit</b> For mounting on door or solid faceplate Dimensions: 96 x 96 x 60 mm <ul style="list-style-type: none"> <li>• LCD display</li> <li>• Measurement of currents, voltages, active, reactive and apparent power, internal temperature and power factor</li> <li>• Metering:               <ul style="list-style-type: none"> <li>- Active energy consumed or produced</li> <li>- Reactive energy consumed or produced</li> <li>- Operating time</li> <li>- Pulses</li> </ul> </li> <li>• THD voltages and currents up to order 51</li> <li>• Programmable alarms on all functions</li> </ul> Can take 2 optional modules
1	146 71	<b>Modules for EMDX<sup>3</sup> - Access multi-function measuring unit</b> RS485 communication module JBUS/MODBUS link
1	146 72	1-output module Can be assigned to pulse feedback, alarm feedback or control of wiring devices

Pack	Cat.Nos	EMDX <sup>3</sup> - Premium
1	146 69	<b>Multi-function measuring units</b> For mounting on door or solid faceplate Dimensions: 96 x 96 x 60 mm <ul style="list-style-type: none"> <li>• LCD display</li> <li>• Measurement of currents, voltages, active, reactive and apparent power, internal temperature and power factor</li> <li>• Metering:               <ul style="list-style-type: none"> <li>- Active energy consumed or produced</li> <li>- Reactive energy consumed or produced</li> <li>- Operating time</li> <li>- Pulses</li> </ul> </li> <li>• Individual harmonics up to order 63</li> <li>• Programmable alarms on all functions</li> </ul> Can take 4 optional modules

Pack	Cat.Nos	EMDX <sup>3</sup> - Premium (continued)
1	146 73	<b>Modules for EMDX<sup>3</sup> - Premium multi-function measuring units</b> RS 485 communication module JBUS/MODBUS link
1	146 76	Ethernet communication module Link: MODBUS/TCP or JBUS/MODBUS RTU on TCP
1	146 78	Ethernet communication module with RS 485 gateway Link: MODBUS/TCP or JBUS/MODBUS RTU on TCP 1 to 247 JBUS/MODBUS slaves can be connected
1	146 74	<b>Storage module</b> Storage of active and reactive power over 62 days, the last 10 alarms and the average voltage and frequency values over 60 days max.
1	146 75	<b>Module with 2 inputs/2 outputs</b> Up to 3 modules, i.e. 6 inputs/6 outputs, can be installed
1	146 77	<b>Temperature module</b> Indication of the internal temperature and possibility of connecting 3 sensors for measuring the external temperature

Pack	Cat.Nos	Communication and supervision
		<b>Web servers</b> Enable remote viewing, via a web browser on PCs, smartphones, web viewers, tablet computers such as iPads, Archos, etc., of values collected on electricity meters and multi-function measuring units
1	261 78	For 32 metering points (meters or multi-function measuring units)
1	261 79	For an unlimited number of metering points (meters or multi-function measuring units)
1	046 88	<b>IP converter</b> For RS485/Ethernet conversion for connecting electricity meters and multi-function measuring units to an IP network
		<b>Legrand supervision software - made-to-measure</b>
1	900 028	For customised display of the values collected and control of the power installation on a PC
		<b>Legrand software dedicated to measurement</b>
		For displaying the values collected from electricity meters or multi-function measuring units on a PC connected to the network
1	261 88	For 32 metering points (supplied on CD)
1	261 89	For an unlimited number of metering points (supplied on CD)

## Current transformers CT



047 79

### Pack Cat.Nos Single-phase current transformers (CT)

Used with ammeters, electricity meters or multi-function measuring units  
Provide a 0 to 5 A current at the secondary, proportional to the primary current  
For fixing on plates, EN 60715 rail  
Cat.Nos 046 31/34/36, or bars  
Secondary connected by terminals or lugs  
Precision class 1%

#### For 16 x 12.5 mm bar and Ø21 mm cable

Transformation ratio	Output (VA)
50/5	1.25
100/5	2.5
200/5	5.5

Pack	Cat.Nos
1	046 31
1	046 34
1	046 36

#### For 20.5 x 12.5 and 30 x 10.5 mm bar and Ø23 mm cable

Transformation ratio	Output (VA)
300/5	11

Pack	Cat.Nos
1	047 75

#### For 40.5 x 10.5 mm bar and Ø35 mm cable

Transformation ratio	Output (VA)
400/5	12

Pack	Cat.Nos
1	046 38

#### For 65 x 32 mm bar

Transformation ratio	Output (VA)
600/5	12
800/5	15
1000/5	20

Pack	Cat.Nos
1	047 76
1	047 77
1	047 78

#### For 84 x 34 mm bar

Transformation ratio	Output (VA)
1250/5	15

Pack	Cat.Nos
1	047 79

#### For 127 x 38 mm bar

Transformation ratio	Output (VA)
1500/5	15
2000/5	20

Pack	Cat.Nos
1	046 45
1	046 46

#### For 127 x 54 mm bar

Transformation ratio	Output (VA)
2500/5	50
4000/5	50

Pack	Cat.Nos
1	047 80
1	046 48

### Three-phase current transformers (CT)

Used with ammeters, electricity meters or multi-function measuring units  
Provide a 0 to 5 A current at the secondary, proportional to the primary current  
For fixing directly on bars  
Secondary connected by terminals or lugs  
Precision class 1%

#### For three 20.5 x 5.5 mm bars

Transformation ratio	Output (VA)
250/5	3

Pack	Cat.Nos
1	046 98

#### For three 35 x 5.5 mm bars

Transformation ratio	Output (VA)
400/5	4

Pack	Cat.Nos
1	046 99

## Current transformers CT

### Current transformers (CT)

#### Technical characteristics

Degree of protection: IP 20

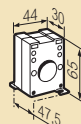
Operating frequency: 50/60 Hz

#### Dimensions

- Single-phase CTs

Cat.Nos 046 31/34/36 for 16 x 12.5 mm bar and Ø21 mm cable

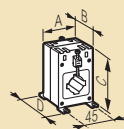
Fixing on EN 60715 rail



Cat.No 047 75 for 20.5 x 12.5 and 30 x 10.5 mm bar and Ø23 mm cable

Cat.No 046 38 for 40.5 x 10.5 mm bar and Ø35 mm cable

Fixing on EN 60715 rail or on plate

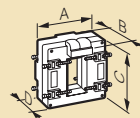


Cat.Nos	A	B	C	D	Ø	Fixing centres on plate
047 75	56	42	94	50	23	50 x 45
046 38	77	46	107	54	35	54 x 45

Cat.Nos 047 76/77/78 for 65 x 32 mm bar

Cat.No 047 79 for 84 x 34 mm bar

Fixing on bar

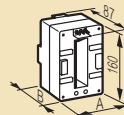


Cat.Nos	A	B	C	D
047 76/77/78	90	90	94	40
047 79	96	87	116	58

Cat.Nos 046 45/46 for 127 x 38 mm bar

Cat.Nos 047 80 and 046 48 for 127 x 54 mm bar

Fixing on bar



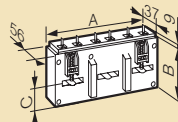
Cat.Nos	A	B
046 45/46	99	58
046 48/047 80	125	40

- Three-phase CT

Cat.No 046 98 for three 20.5 x 5.5 mm bars

Cat.No 046 99 for three 35 x 5.5 mm bars

Fixing on bar



Cat.Nos	A	B	C
046 98	107	58.5	25
046 99	135	66.5	30

### Determination of the max. distance between CT and meter

Cat.Nos	Max. power of CT	Meter consump. (W)	Max. loss in capac. (VA)	Max. distance bet. CT & meter (m)		
				Wiring 2.5 mm <sup>2</sup>	Wiring 4 mm <sup>2</sup>	Wiring 6 mm <sup>2</sup>
046 31	1.25	0.5	0.75	1.8	2.7	3.9
046 34	2.5	0.5	2	4.9	7.1	10.4
046 98	3	0.5	2.5	6.1	8.9	13
046 99	4	0.5	3.5	8.5	12.4	18.1
046 36	5.5	0.5	5	12.2	17.8	25.9
047 75	11	0.5	10.5	25.5	37.3	54.4
046 38	12	0.5	11.5	28	40.8	59.6
047 76						
047 77/79	15	0.5	14.5	35.3	51.5	75.2
046 45						
046 46	20	0.5	19.5	47.4	69.3	101.1
047 78						
047 80	50	0.5	49.5	120.4	175.8	256.7
046 48						

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

└ rail mounting

## ■ Technical characteristics

### Single-phase meters Cat.Nos 046 70/72/77/78/79/81

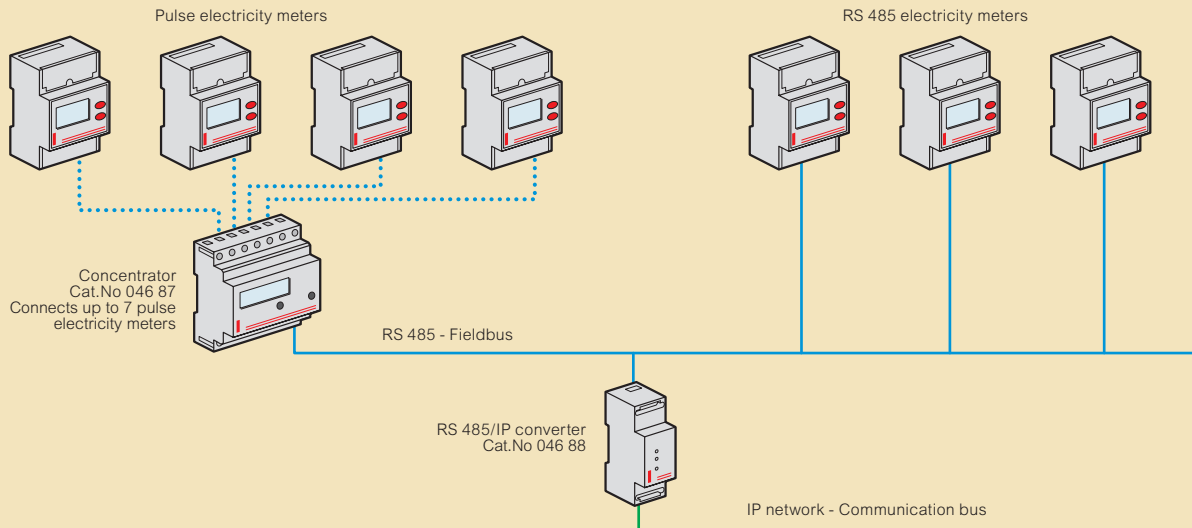
LCD display: 7 digits  
 Resolution: 0.1 kWh  
 Maximum indication: 99999.9 kWh  
 Metrological LED: 1 Wh/pulse (Cat.No 046 70 : 0.5 Wh/pulse)  
 Accuracy (EN 62053-21): class 1  
 Reference voltage Un: 230 V-240 V  
 Reference frequency: 50-60 Hz  
 Pulse output: 1 pulse/10 Wh  
 (Cat.No 046 70: 2 pulse/Wh)

### Three-phase meters Cat.Nos 046 73/74/80/82/83/84/85/86

LCD display: 8 digits  
 Resolution: 0.01 kWh<sup>(1)</sup>  
 Maximum indication: 99999.99 kWh<sup>(1)</sup>  
 Metrological LED: 0.1 Wh/pulse or 1 Wh/pulse  
 Active energy accuracy (EN 62053-21): class 1  
 Reactive energy accuracy (EN 62053-23): class 2  
 Reference voltage Un:  
 - Single-phase: 230-240 V  
 - Three-phase: 230(400)-240(415) V  
 Operating limit range (EN 62053-21, EN 62053-23):  
 - Single-phase: 110 to 254 V  
 - Three-phase: 110(190) to 254(440) V  
 Pulse output: 1 pulse/10 Wh

Cat.Nos		046 70	046 81	046 72	046 77	046 78	046 79	046 73	046 80	046 82	046 83	046 74	046 84	046 85	046 86	
Number of modules		1	2	2	2	2	2	4	4	4	4	4	4	4	4	
Connection	Direct	●	●	●	●	●	●	●	●	●	●					
	Via a current transformer											●	●	●	●	
	Single-phase	●	●	●	●	●	●					●	●	●	●	
	Three-phase							●	●	●	●	●	●	●	●	
Max. current		32 A	36 A	63 A	63 A	63 A	63 A	63 A	63 A	63 A	63 A	5 A (CT)	5 A (CT)	5 A (CT)	5 A (CT)	
Metering and measurement	Total active energy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Total reactive energy							●	●	●	●	●	●	●	●	
	Partial active energy (reset)		●	●	●	●	●	●	●	●	●	●	●	●	●	
	Partial reactive energy (reset)							●	●	●	●	●	●	●	●	
	Active power			●	●	●	●	●	●	●	●	●	●	●	●	
	Reactive power							●	●	●	●	●	●	●	●	
	Apparent power							●	●	●	●	●	●	●	●	
	Current			●	●	●	●	●	●	●	●	●	●	●	●	
	Voltage			●	●	●	●	●	●	●	●	●	●	●	●	
	Frequency			●	●	●	●	●	●	●	●	●	●	●	●	
	Power factor			●	●	●	●	●	●	●	●	●	●	●	●	
	Time-of-use			●	●											
	Average active power							●	●	●	●	●	●	●	●	
	Max. average active power value							●	●	●	●	●	●	●	●	
	Dual tariff							●	●	●	●					
Communication	Pulse output	●	●	●	●	●	●	●	●	●		●	●	●	●	
	RS 485 interface				●	●	●	●	●	●	●		●	●	●	
MID compliant					●	●				●	●			●	●	
Operating conditions	Reference temperature	23 °C ± 2 °C														
	Operating temperature	-20 to +55 °C			-10 to +45 °C				-5 to +55 °C							
	Storage temperature	-40 to +70 °C			-25 to +70 °C				-25 to +70 °C							
	Consumption				≤ 8 VA				≤ 4 VA per phase				≤ 1 VA per phase			
	Heat dissipation				≤ 6.5 W				≤ 6 W				≤ 4 W			

## ■ Interfacing with IP communication network



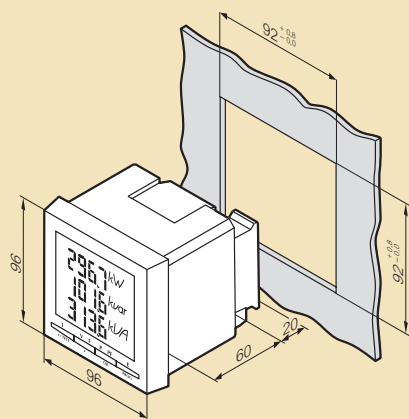
(1) For direct connection meters.  
 If connected via transformers, the resolution and maximum indication depend on the transformation ratios of these transformers

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

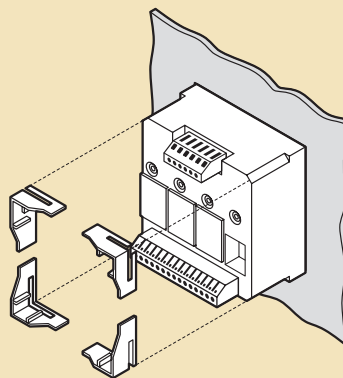
### ■ Technical characteristics

Cat.Nos		046 75/76	146 68	146 69	
Connection	Current measurement terminals	4 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>	
	Other terminals	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	
Protection index	Front cover	IP 51	IP 52	IP 52	
	Casing	IP 20	IP 30	IP 30	
Weight		205/215 g	400 g	400 g	
Display		Backlit LCD	Backlit LCD	Backlit LCD	
Measurements		3P+N, 3P, 2P, 1P+N	3P+N, 3P, 2P, 1P+N	3P+N, 3P, 2P, 1P+N	
Voltage measurement	Direct	Phase/phase	50 to 520 V $\sim$	50 to 500 V $\sim$	18 to 700 V $\sim$
		Phase/neutral	28 to 300 V $\sim$	28 to 289 V $\sim$	11 to 404 V $\sim$
	From a PT	Primary	-	-	$\leq$ 500 kV
		Secondary	-	-	60, 100, 110, 115, 120, 173, 190 V $\sim$
	Permanent overload between phases		760 V $\sim$	800 V $\sim$	760 V $\sim$
	Update period		1 s	1 s	1 s
Current measurement	From a CT	Primary	5 to 9999 A	$\leq$ 9999 A	$\leq$ 9995 A
		Secondary	5 A	5 A	1 or 5 A
	Minimum measurement		5 mA	5 mA	10 mA
	Input consumption		< 0.6 VA	< 0.6 VA	< 0.3 VA
	Display		0 to 9999 A	1 to 11 kA	0 to 11 kA
	Permanent overload		6 A	6 A	10 A
	Intermittent overload		60 A/1 s - 120 A/0.5 s	10 In/1 s	10 In/1 s
	Update period		1 s	1 s	1 s
	Max. CT x PT ratio		-	-	10000000
	Power measurement	Total	0 to 9999 kW/kvar/kVA	0 to 11 MW/Mvar/MVA	0 to 8000 MW/Mvar/MVA
Update period			1 s	1 s	
Frequency measurement	Measurement range	45.0 to 65.0 Hz	45.0 to 65.0 Hz	45.0 to 65.0 Hz	
	Update period		1 s	1 s	
Auxiliary power supply	50/60 Hz	200 to 277 V $\sim$ $\pm$ 15%	110 to 400 V $\sim$ $\pm$ 10%	110 to 400 V $\sim$ $\pm$ 10%	
	DC	-	120 to 350 V $\pm$ 20%	120 to 350 V $\pm$ 20%	
	Consumption	< 5 VA	< 10 VA	< 10 VA	
Operating temperature		-10 °C to +55 °C	-10 °C to +55 °C	-10 °C to +55 °C	
Storage temperature		-20 °C to +70 °C	-20 °C to +85 °C	-20 °C to +85 °C	

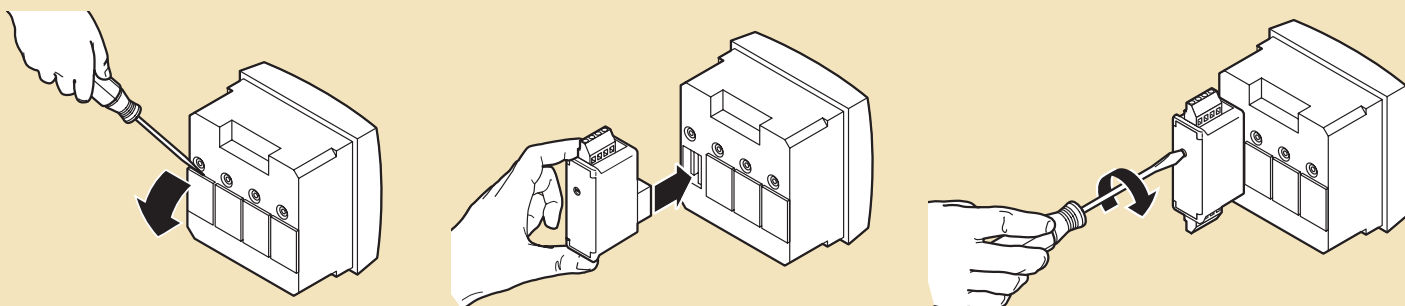
### ■ Flush-mounting dimensions Cat.Nos 146 68/69



### ■ Fixing on door Cat.Nos 146 68/69



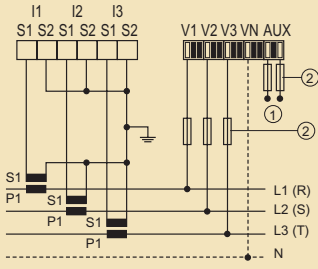
### ■ Fitting modules Cat.Nos 146 68/69



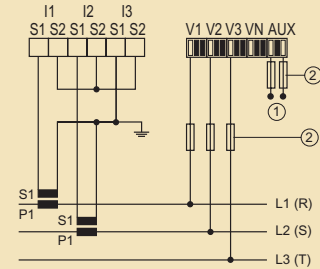
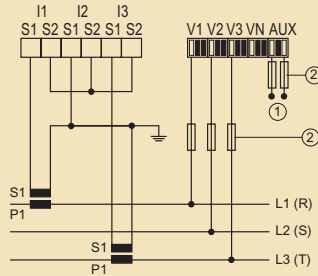


## ■ Connection solutions

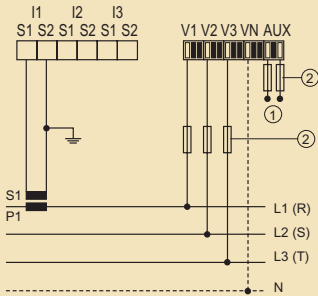
### Unbalanced three-phase network (3 or 4-wire)



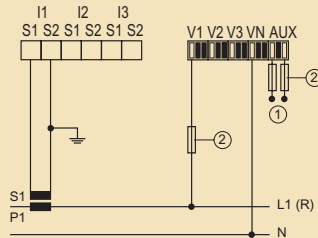
### (3-wire)



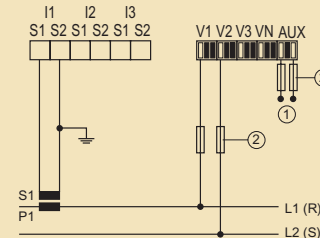
### Balanced three-phase network (3 or 4-wire)



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

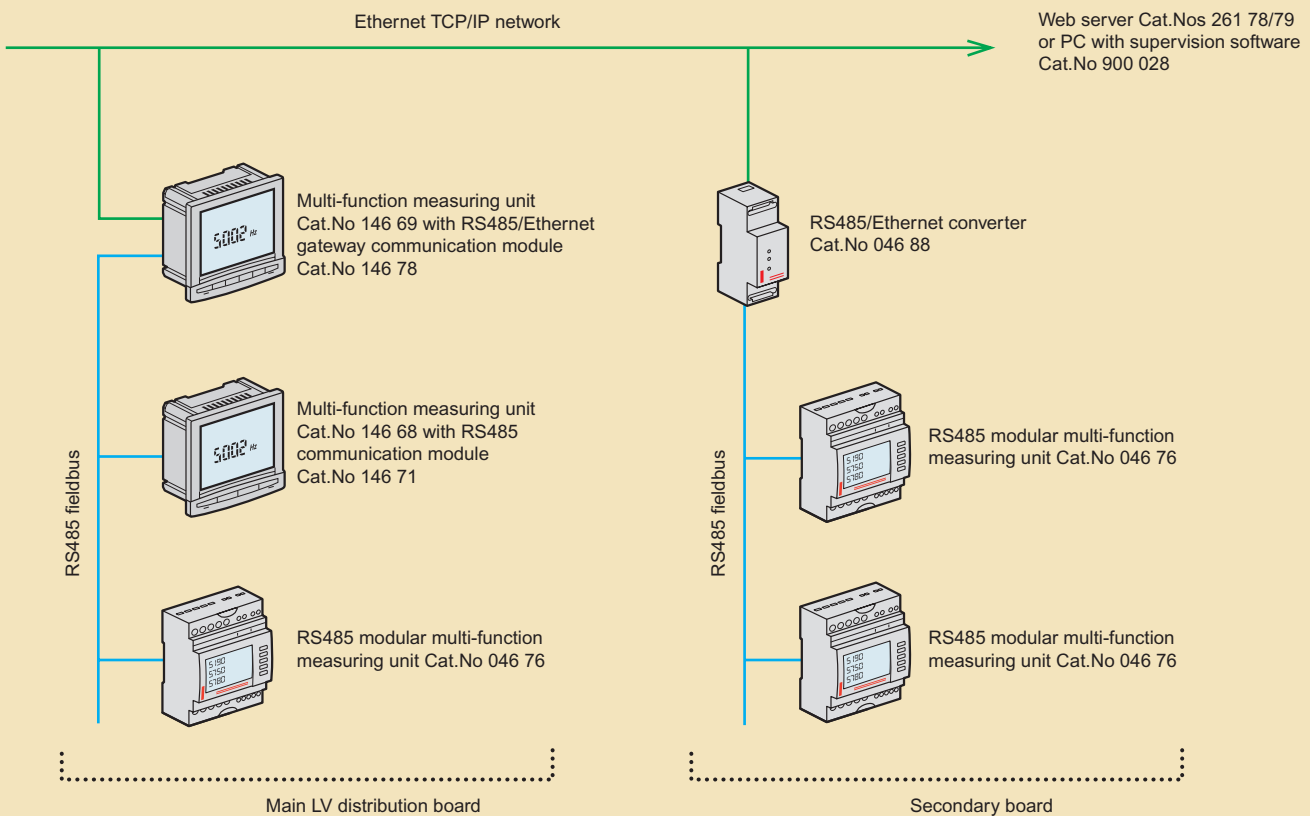


### Two-phase network (2-wire)



- ① Auxiliary power supply : IEC/EC 110 ... 400 VAC/120 ... 350 VDC/12 ... 48 VDC
- ② Fuse : 0.5 A gG/BS 88 2A gG/0.5 A class CC

## ■ Interfacing with IP communication network





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