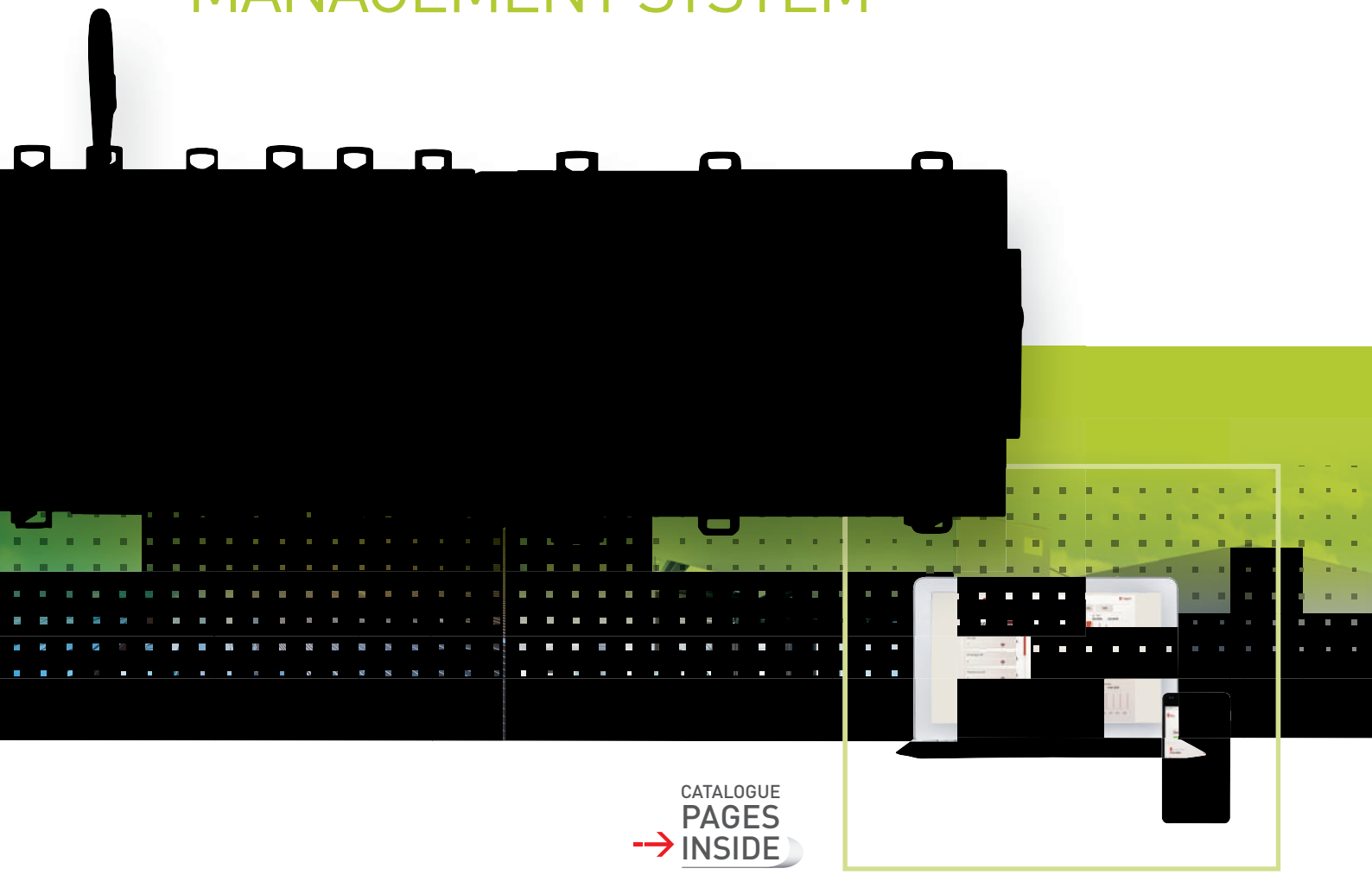
CX³ ENERGY MANAGEMENT SYSTEM

A UNIVERSAL & INNOVATIVE ENERGY MANAGEMENT SYSTEM



CATALOGUE
PAGES
INSIDE

THE GLOBAL SPECIALIST
IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURES

legrand®

ENERGY EFFICIENCY

TAKING EFFECTIVE ACTION TO ENSURE ENERGY EFFICIENCY NOT ONLY REDUCES ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS, BUT ALSO YIELDS FINANCIAL BENEFITS

AS WELL AS EASIER USE AND FUNCTIONING OF INSTALLATIONS.

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The Legrand **ENERGY MANAGEMENT** system was created to supervise and manage energy consumption within the building, guaranteeing reliability and continuity of service for maximum efficiency.



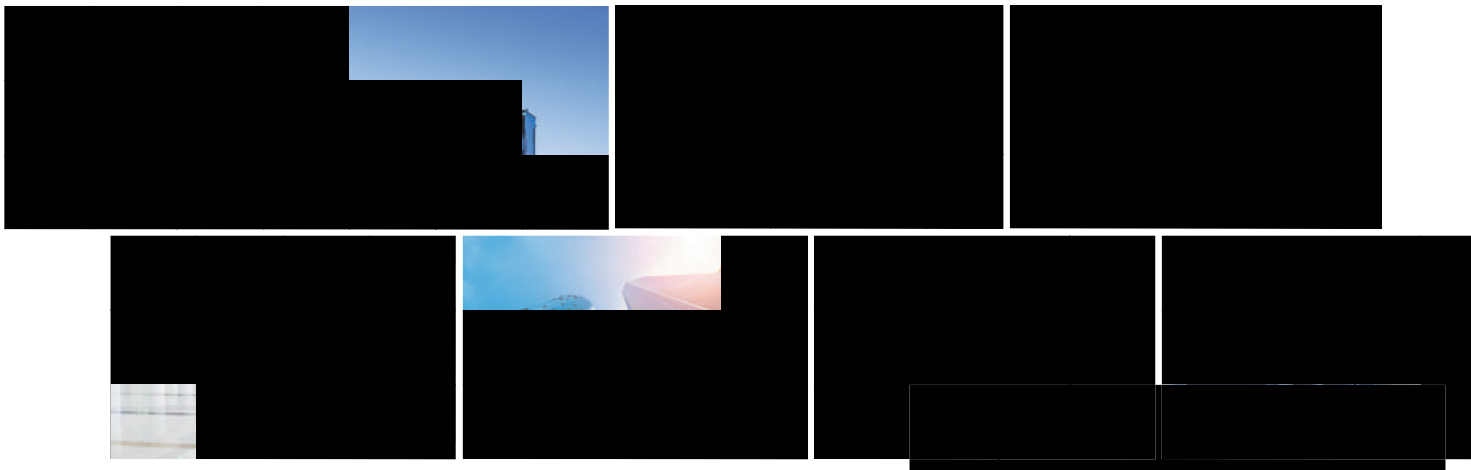
AWARENESS OF ENERGY CONSUMPTION is the **FIRST STEP** towards energy efficiency.

CONTROLLING IT is the **SECOND, ...**



Legrand **solutions**

Legrand offers various solutions for **MEASURING and SUPERVISING** electrical systems that can adapt to all needs and offer total control and manageability.
The versatility of Legrand solutions ensures they will interface with other ENERGY MANAGEMENT systems.



SIMPLE INSTALLATIONS THAT MEASURE CONSUMPTION

devices for measuring electrical values and data collection.

AUTOMATED INSTALLATIONS

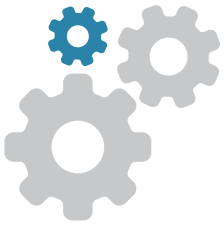
devices for monitoring and automating distribution panels to guarantee continuity of service and timely control of the installation.

CENTRALISED INSTALLATIONS

systems for all-round supervision of installations, providing full functionality for optimal management of all devices.

ENERGY MANAGEMENT actions...

The **Legrand CX³ EMS energy management system** allows you to control your installation in just a few steps.



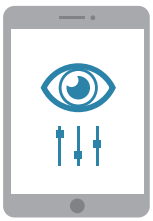
set

Set the system with functions that are customised to your needs.



configure

Programme all devices, locally and remotely, so they can communicate with one another and with other external systems.



supervise

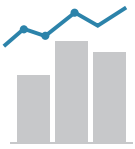
Monitor and control all processes using IT tools to optimise energy consumption anytime, anywhere.

... and functions



register

Register the consumption of all installation users.



measure

Measure analogue or electrical values (current, voltage, power, etc).



signalling

Display the status of electrical protection devices or circuits, both locally and remotely.



control

Operate electrical protection devices or motorised controls, both locally and remotely, by means of manual or automatic actions.



communicate

Send all information remotely from the electrical switchboard.



display

Display the data locally or remotely, on built-in screens or on PCs, smartphones or tablets with an internet connection.

ENERGY MANAGEMENT advantages

The CX³ EMS energy management system allows precise management and use of energy within a building. It allows full control of all activities in order to improve their functioning by anticipating possible breakdowns.

Counting and measuring consumption to REDUCE COSTS



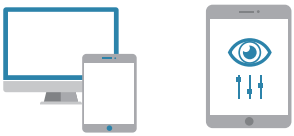
- **be aware** of consumption
- **control** consumption
- **adopt** a constant operating regime to smooth out consumption over time

Monitor and control the installation status to ENSURE CONTINUITY OF SERVICE



- **visualise** and assess technical alarms in real time
- **find out** the installation status
- **prevent** damage to parts of the installation

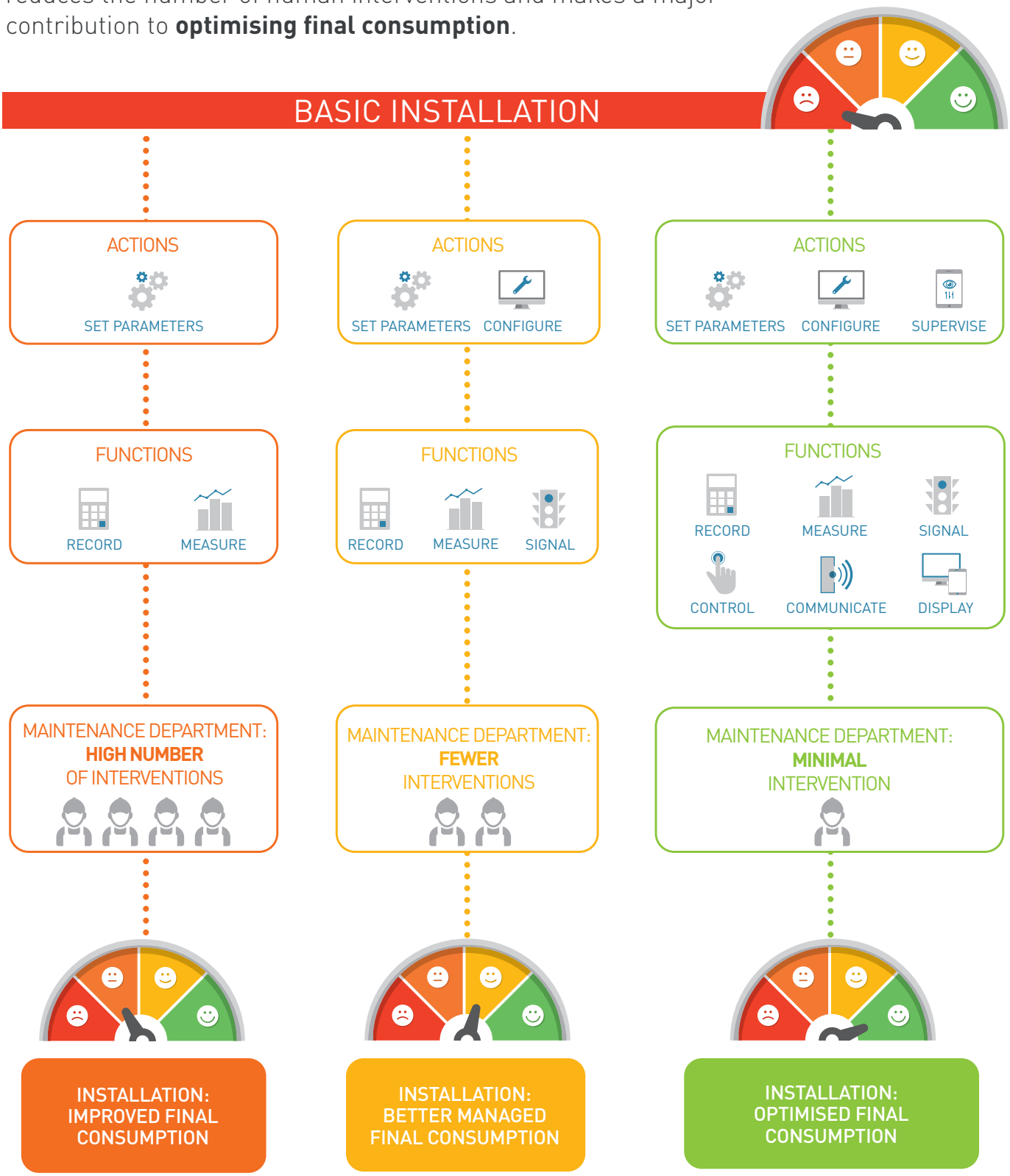
Analyse data to IMPROVE PROCESSES

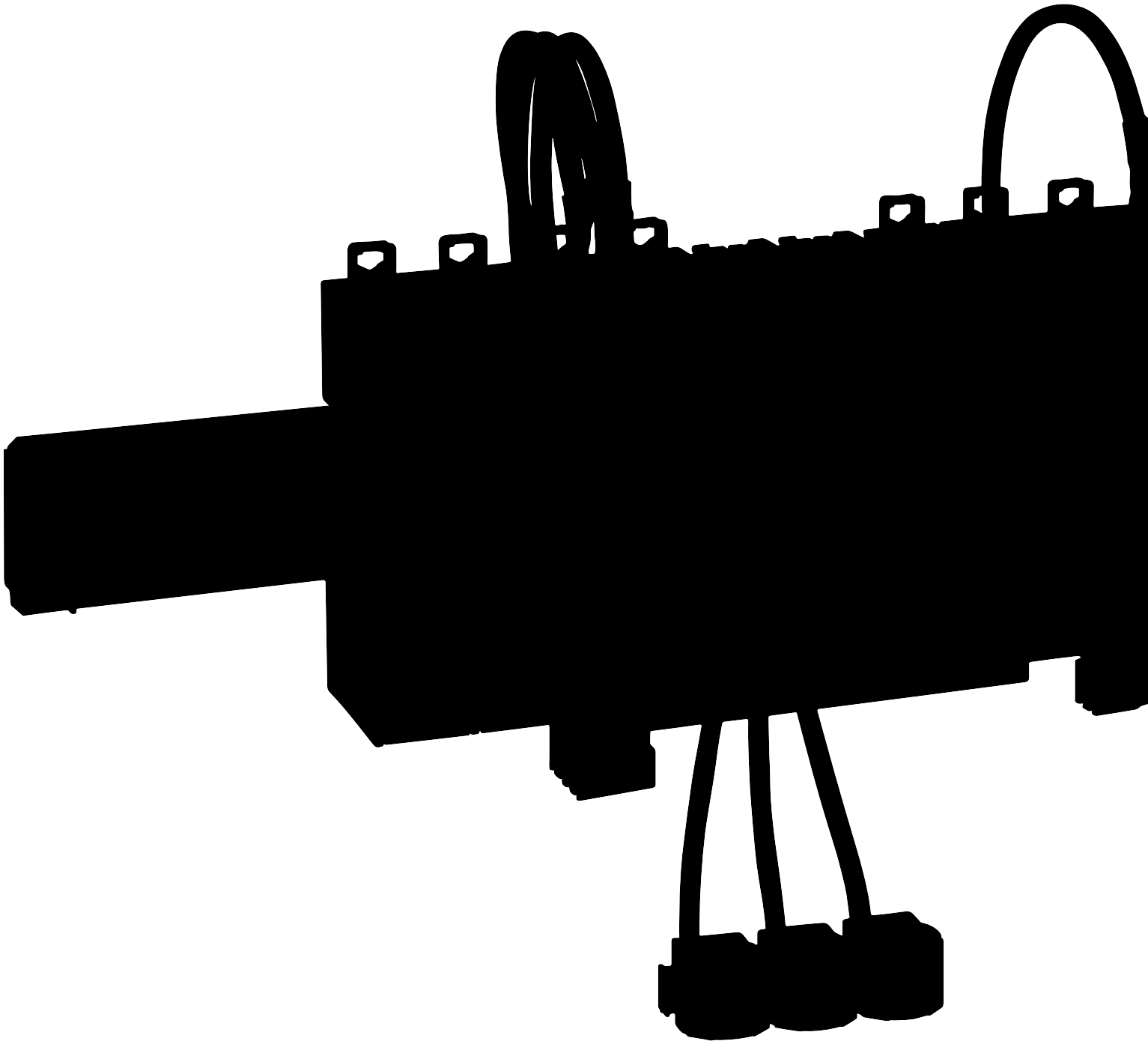


- **determine** annual energy needs to define how consumption is distributed
- **analyse** the trend over time to control performance
- **log** events to prevent critical issues

MAXIMUM NUMBER OF FUNCTIONS AND ACTIONS = MINIMUM NUMBER OF INTERVENTIONS AND CONSUMPTION

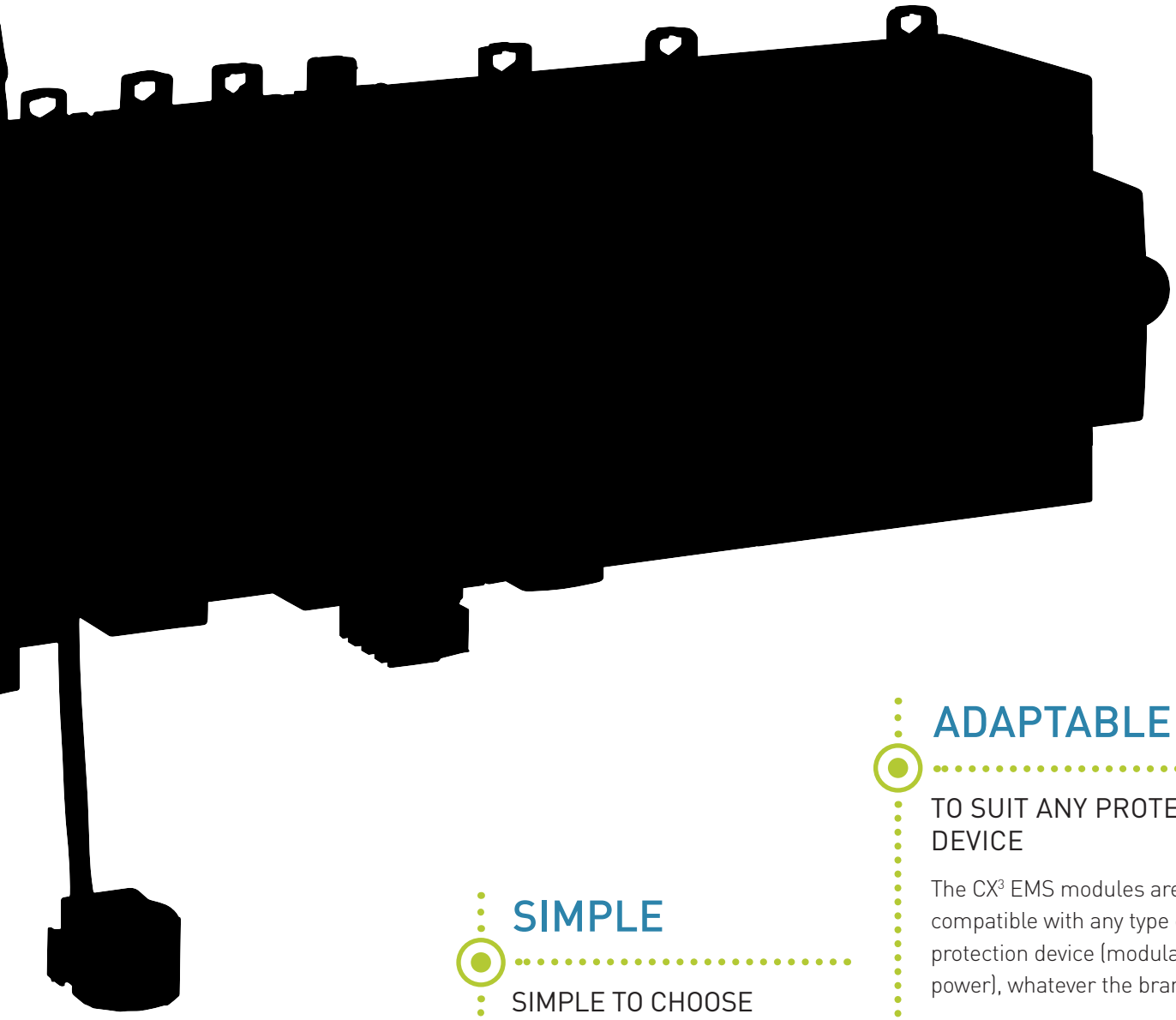
In an electrical infrastructure, having more functions and actions reduces the number of human interventions and makes a major contribution to **optimising final consumption**.





CX³ EMS
an innovative **supervision** system

CX³ EMS is the simplified supervision system able to display, measure and control the installation locally or remotely.
An add-on autonomous system, which, thanks to the innovative automatic connection system, is easy to assemble and does not require any changes to the existing panel wiring.



COMPLETE AND COMPACT

The **CX³ EMS supervision system**, with its extremely compact design, offers all the functions you need for complete installation supervision.

- measurement
- status (ON/OFF/fault)
- control
- pulse counting
- serial communication
- display

SIMPLE

SIMPLE TO CHOOSE

Only 14 modules with dedicated functions for supervising any installation.

SIMPLE TO INSTALL

Quick, pre-cabled connections on a communication rail or with patch cords that do not hinder electrical switchboard cabling.

SIMPLE TO CONFIGURE

Configuration both directly from the panel without the help of a PC and via dedicated software that can be downloaded from the Legrand website via the E-Catalogue.

ADAPTABLE

TO SUIT ANY PROTECTION DEVICE

The CX³ EMS modules are compatible with any type of protection device (modular or power), whatever the brand.

FOR NEW AND EXISTING PANELS

Its compact dimensions and the possibility of connecting the system via 2 different solutions make it easy to install in new or existing switchboards.

CX³ EMS

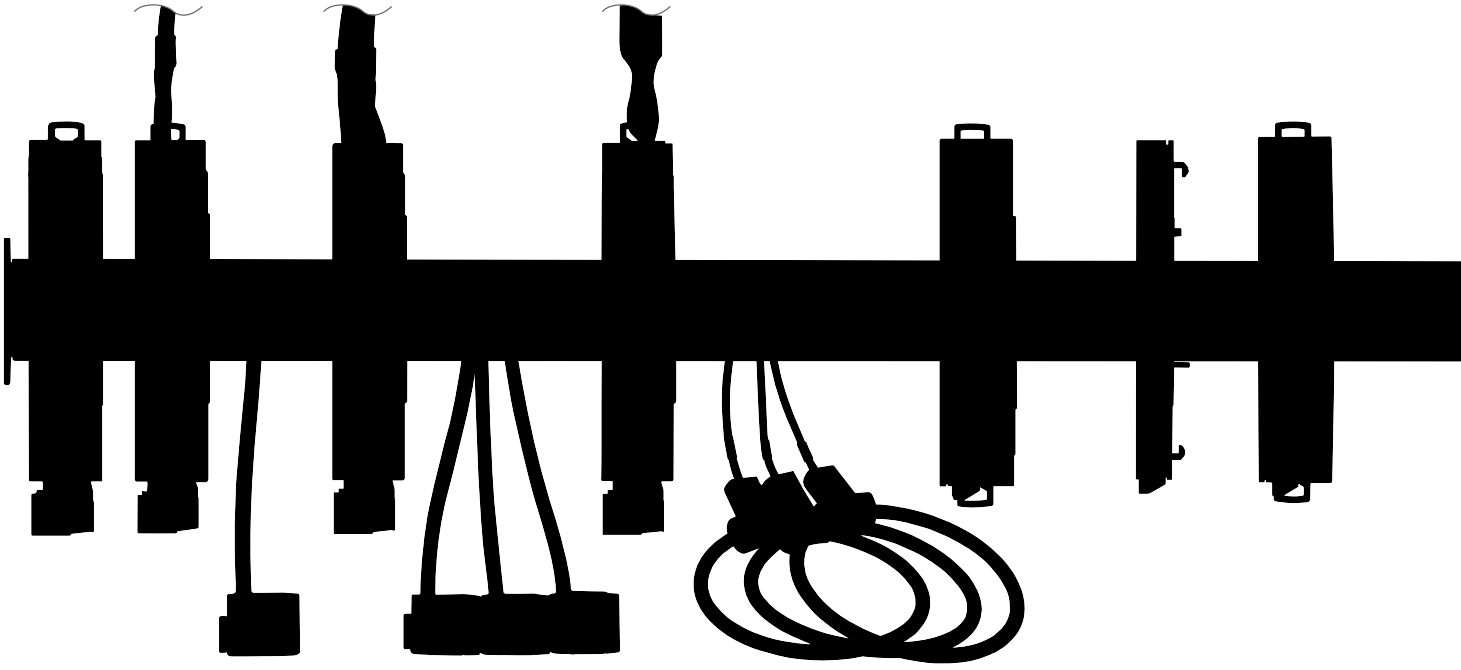
complete, compact and **multifunctional**





MEASUREMENT

SIGNALLING



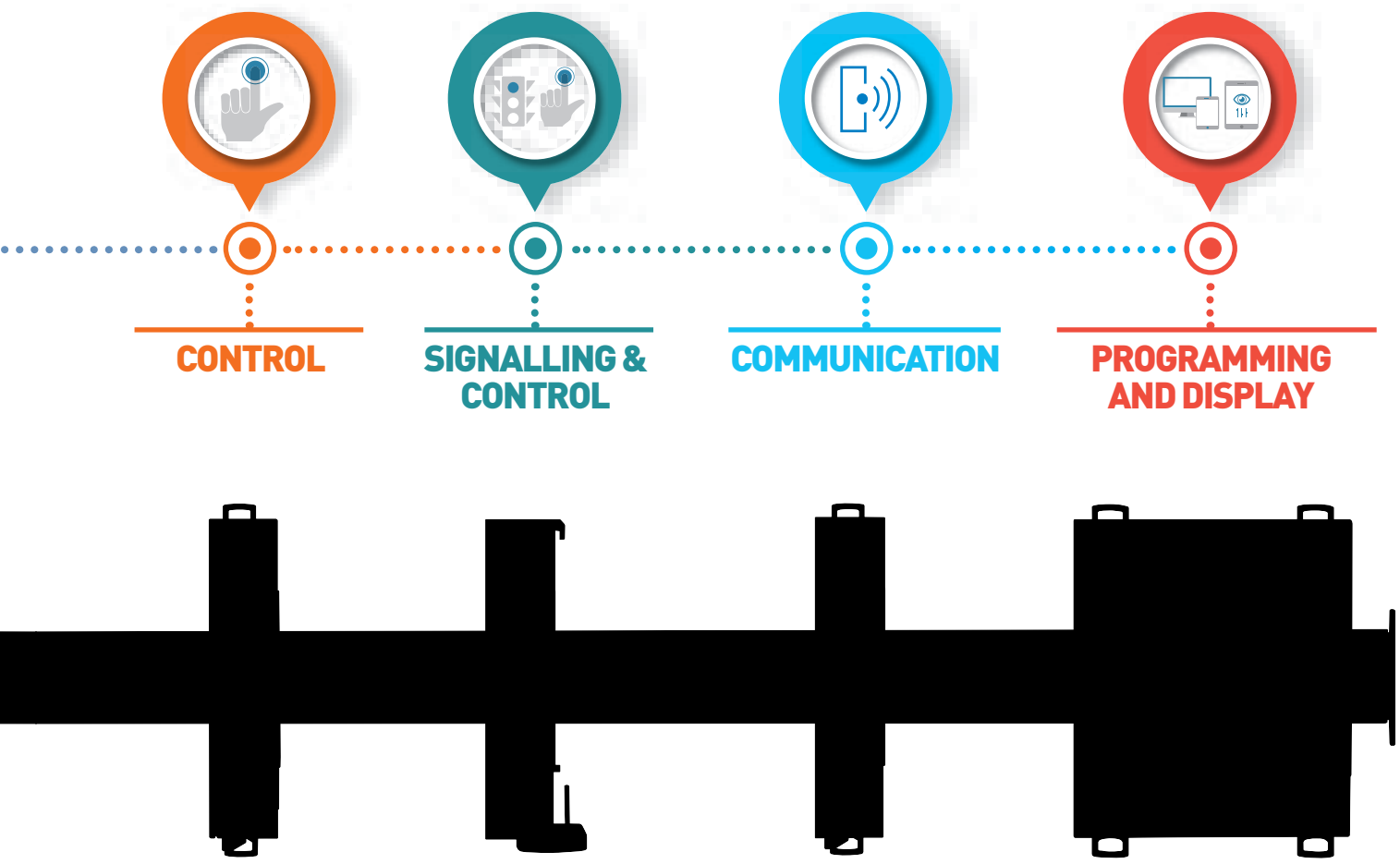
With the same performance as the "classic" measuring units, the CX³ EMS measuring modules can be used to measure the electrical energy consumed by a single-phase or three-phase circuit and the various electrical values:
- Active (kW), reactive (kVAR) and apparent (kVA) power on all phases or cumulative
- Simple and compound voltages
- Current consumption on each phase
- Frequency and Cos φ
- Harmonics

Concentrator module for energy metering by means of pulses: collects data from meters with pulse output such as electricity meters or water and gas meters, etc.
Up to 3 pulse circuits.

Compact modules indicating the status of the associated device:
Contacts:
- open
- closed
- triggered

In addition, for the LED version:
- MCCB plugged-in/ drawn-out
- springs loaded for opening/closing of ACBs

All the modules in the **CX³ EMS supervision system** have compact dimensions, in order to minimise the space taken up in the electrical switchboard.



CONTROL

Universal control module. Used to remotely control different electrical loads such as relays, contactors, and motorised controls on modular or power circuit breakers, whatever their brand.

SIGNALLING & CONTROL

The control and status reporting module is used to remotely control and display the status of the Legrand 1 and 2-module contactors up to 25 A, as well as pulse-operated latching relays.

COMMUNICATION

The EMS CX³/RS 485 communication interface allows the conversion of data from the EMS CX³ network to the MODBUS RS 485 network, in order to display and manipulate the data outside the electrical enclosure.

PROGRAMMING AND DISPLAY

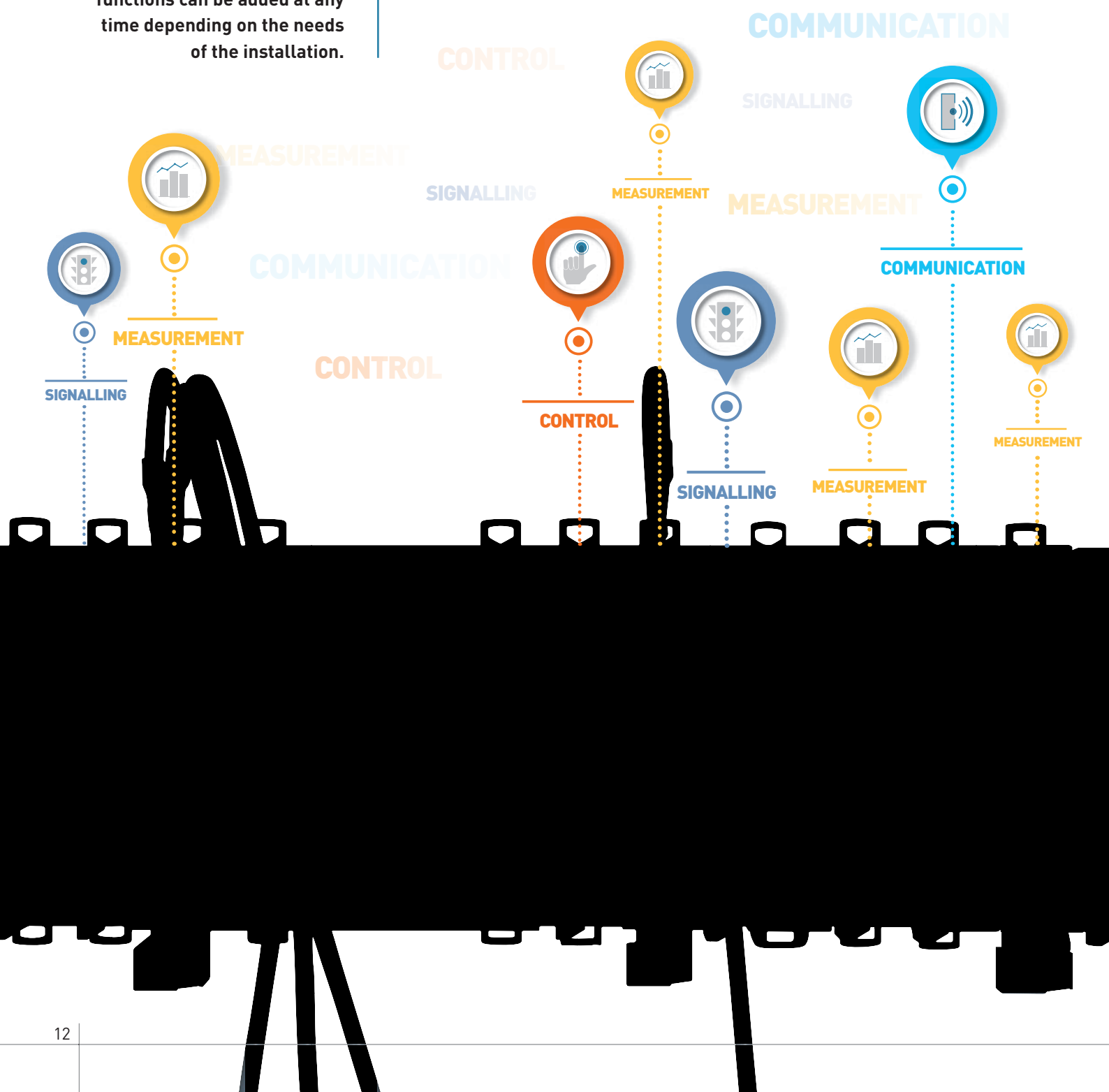
Stand-alone configuration module for controlling the entire installation, locally, in the enclosure:
- system configuration
- test
- consumption display
- alarm control
- device control
- memorising alarms

CX³ EMS

simple to choose...

The CX³ EMS system **does not require a minimum number of modules** and it also makes monitoring easy. Thanks to its scalability, **new functions can be added at any time depending on the needs of the installation.**

The CX³ EMS system **consists of DIN rail mounting modules.**



...**simple** to install

Quick and simple data connection

In both cases, data connection is simple and immediate and **does not require any other additional space in the electrical enclosure.** If using the communication rail, connection is made automatically via the rear contacts, when the CX³ modules are fixed on the DIN rail of the electrical panel.

The **CX³ EMS system is powered at safety extra low voltage (SELV)** and has 2 types of connection:

- by means of the innovative **communication rail** system
- by means of the quick-fit **patch cords**.



COMMUNICATION RAIL

Connection is made automatically with the connectors at the rear of the CX³ EMS modules.

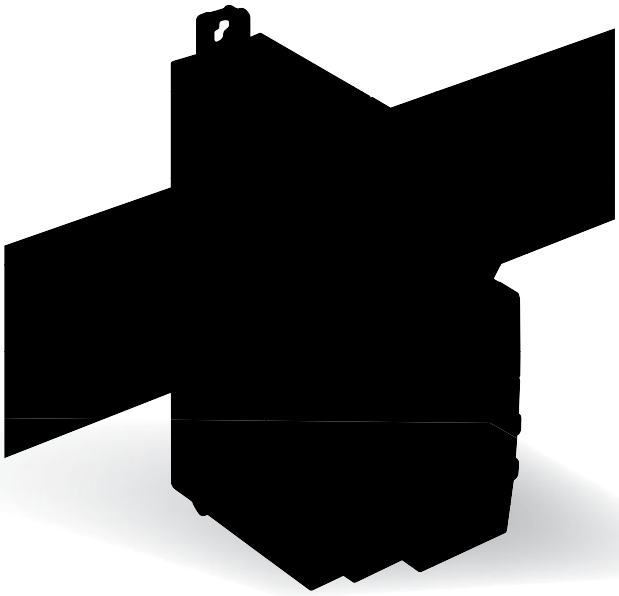
PATCH CORDS

All CX³ EMS modules have ports at the bottom for connection to the bus via patch cords.

CX³ EMS

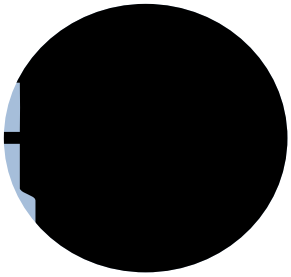
simple to configure

The CX³ **EMS system** has been developed in order to be able to manage, simply and immediately, all functions (measurement, signalling and control), both locally from the electrical panel by means of configuration modules and remotely by means of free dedicated software.



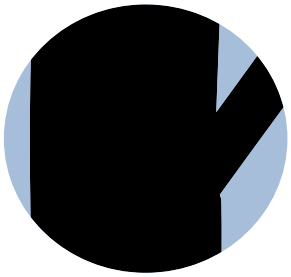
FUNCTION CONFIGURATION

The universal signalling and control modules include 4 DIP switches that enable different function types to be set.



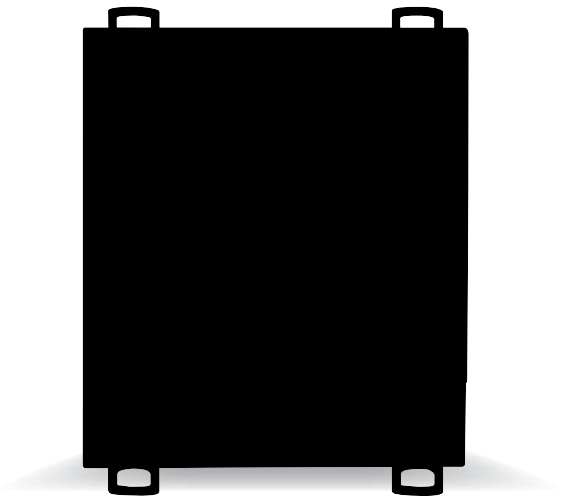
ADDRESS CONFIGURATION

All the modules are equipped with a selector for configuring the address locally.



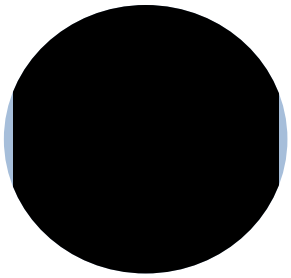
PROGRAMMING AND DISPLAY

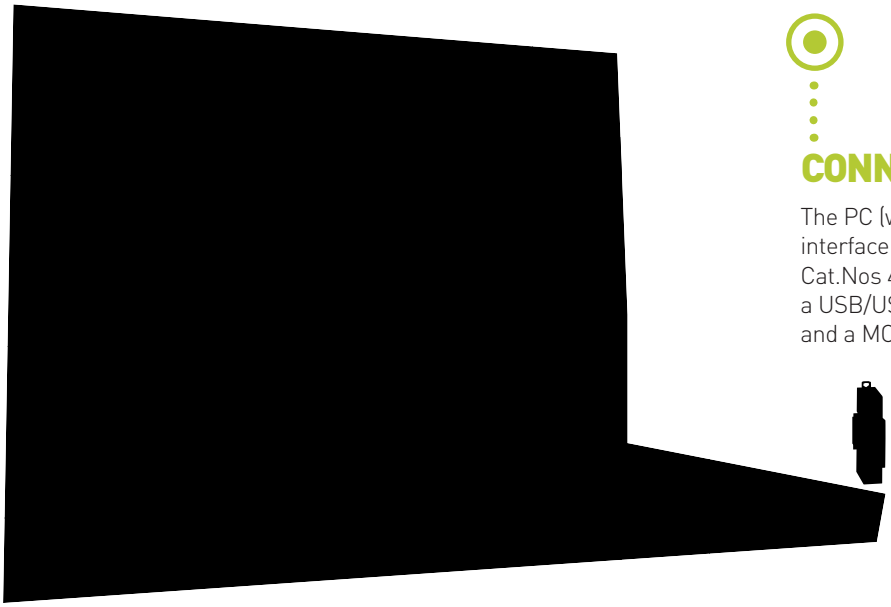
The stand-alone EMS configuration module can be used to configure the system and to visualise all the installed modules, without needing an IP or PC connection.



FUNCTION

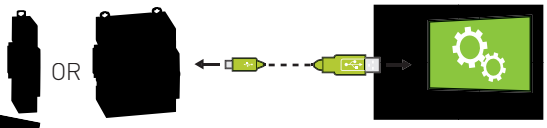
All the modules are also equipped with a multifunction 3-colour LED button to instantly identify the operating status: correct operation, on stand-by, being programmed, being updated, no EMS communication, etc.





CONNECTION

The PC (with pre-installed software) and the EMS CX³ interface Cat.No 4 149 40 or mini-configurator Cat.Nos 4 149 36/37 can be connected directly using a USB/USB micro cable, or remotely via an IP network and a MODBUS/IP gateway Cat.No 0 046 89.



CONFIGURING THE ADDRESS

The software can be used to detect all EMS CX³ modules in the system and assign them an address automatically. The numerical selector switches must be in position "0".

CONFIGURING FUNCTIONS

The software can be used to assign different operating types to the universal modules. The micro-switches must be in position "0".





EMS CX³

adaptable for all installations

EMS CX³ modules are optimised for simple, compact installation and are easily integrated in new or existing installations, in association with **DIN rail mounting circuit breakers such as DX³ or MCCBs such as DPX³ and DMX³.**



SIGNALLING

The universal, configurable signalling module can be associated with all type of signalling auxiliaries on DIN rail mounting MCBs or power circuit breakers:

- DX³
- DPX³
- DMX³



CONTROL

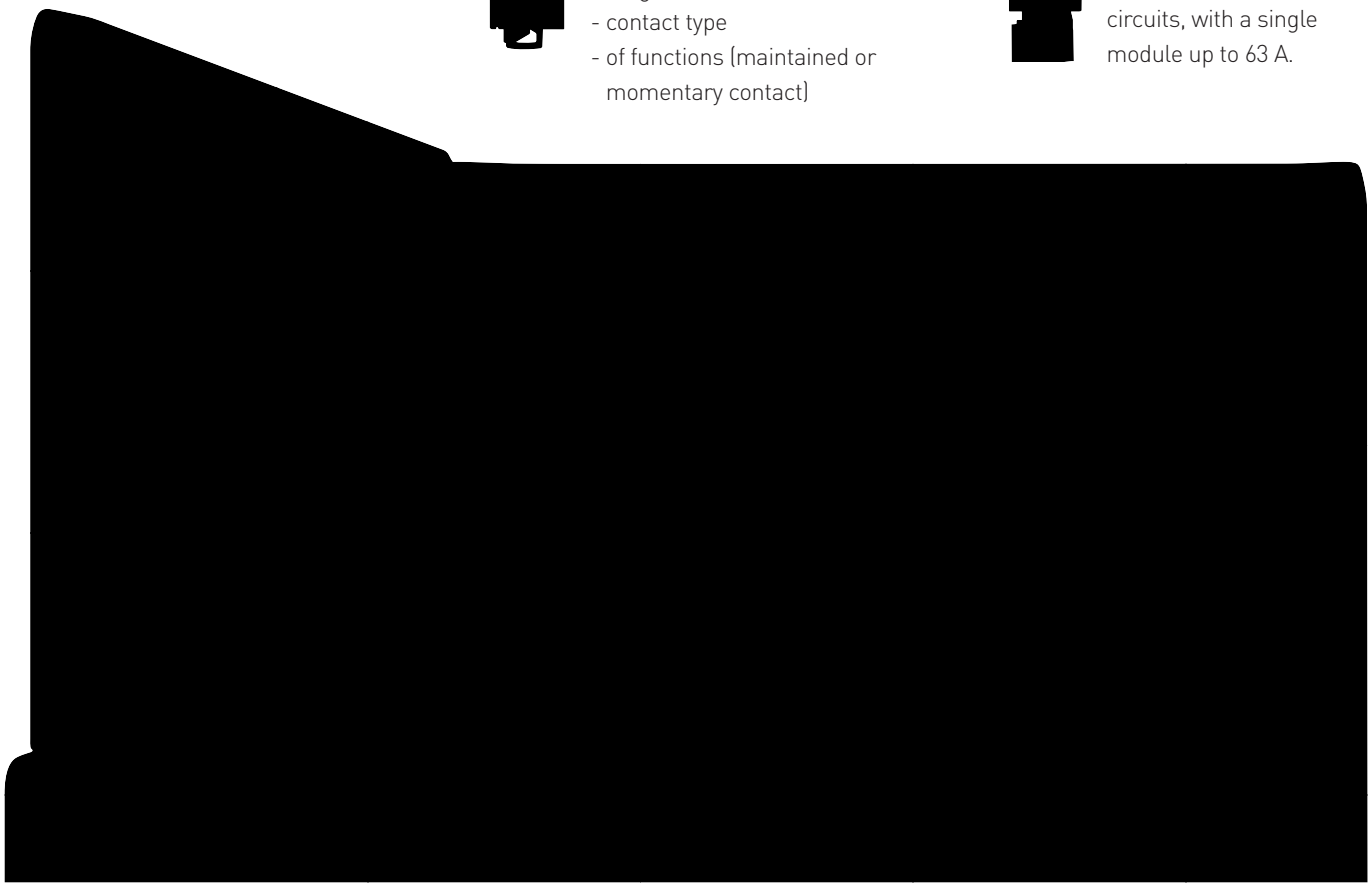
Used to locally or remotely control different electrical loads or motorised controls associated with DIN rail mounting protection devices or supply end equipment. Equipped with DIP switches (on the side) allowing product configuration:

- contact type
- of functions (maintained or momentary contact)



MEASUREMENT UP TO 125 A

Measurement modules with closed Rogowski coils can be used to take measurements on a three-phase circuit up to 63 A or 125 A, or on three single-phase circuits, with a single module up to 63 A.



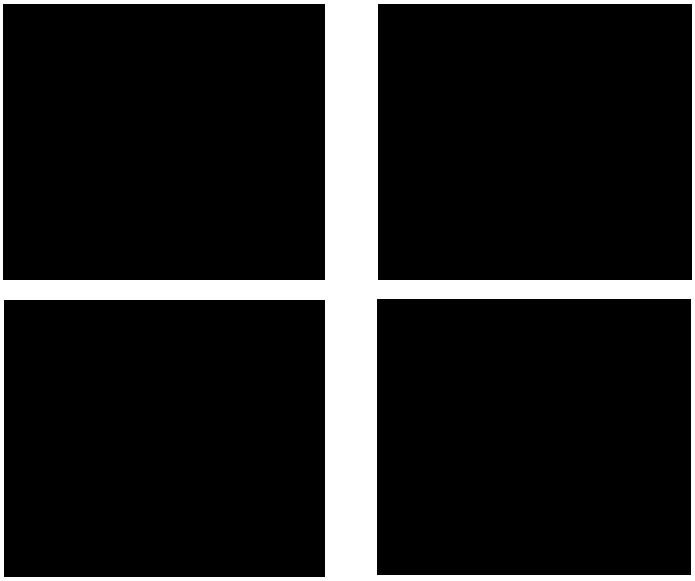
up to **6300 A**

EMS CX³ measurement modules with flexible open Rogowski coils or with current transformers are ideal for the needs of installations **up to 6300 A**



MEASUREMENT WITH OPEN COILS

Three-phase measurement modules with flexible open Rogowski coils can be used to measure currents up to 630 A, 1600 A, 3200 A and 6300 A, depending on the size chosen. They have been specially designed for quick and easy installation. The supports provided are used to fix and centre the coils on the busbars horizontally or vertically.





MEASUREMENT WITH CT

High-current measurement modules for current transformers can be used to take measurements using conventional current transformers (5 A). They can therefore be used in large distribution panels.



CX³ EMS
application examples

EXAMPLE 1 "STAND-ALONE" CONFIGURATION



[redacted]

[redacted]

[redacted]

IDEAL FOR INDIVIDUAL INSTALLATIONS
WHERE THERE IS A LOCAL NEED TO:

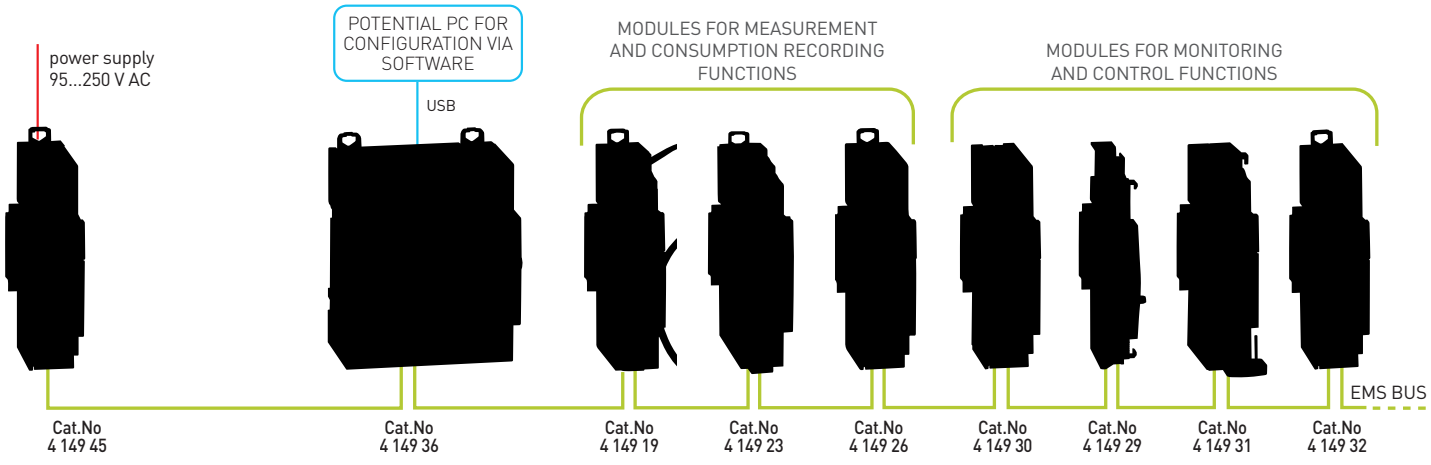
- monitor parameters (electricity, water, gas, heat, etc.) during consumption and/or production
- check the status of various devices (switches, contactors, relays, end runs, etc)
- locally control various devices (switches, contactors, relays, etc)
- register alarms (up to 20)
- generate simple load control automations
- configure the installation simply

Scope of **application**:

Residential buildings and small commercial businesses potentially with photovoltaic and/or thermal solar energy production plants.

Installation

- maximum capacity for expansion: **32 devices**
- maximum distance between two devices: **3 m**
- maximum consumption of the entire system: **1500 mA, divided into 3 interconnected groups**
- maximum consumption of each group: **500 mA supplied by a single power supply (Cat.No 4 149 45)**



EXAMPLE 2

CONNECTED CONFIGURATION

IDEAL FOR INDIVIDUAL INSTALLATIONS WHERE, IN ADDITION TO THE SERVICES DESCRIBED IN EXAMPLE 1, THERE IS A NEED TO:

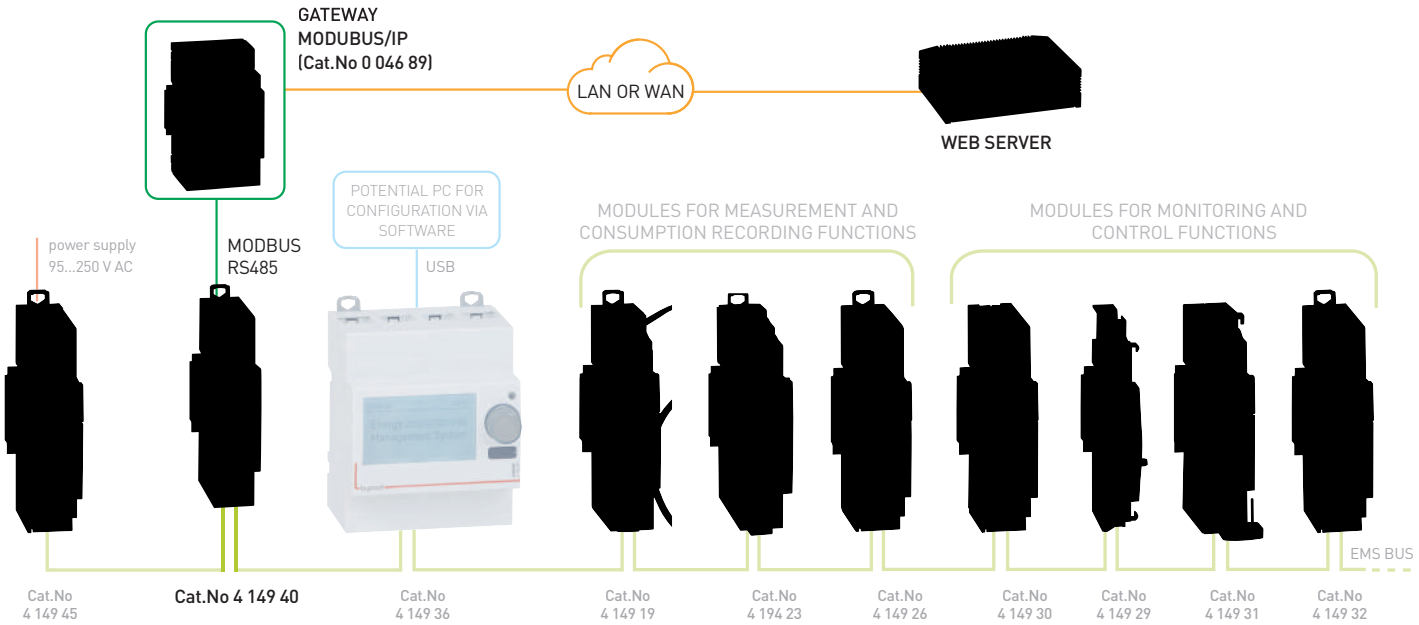
- record the trend of various electrical parameters (voltage, current, power, power factor, frequency, harmonic distortion rate, etc)
- create histograms and energy reports
- record events and alarms
- save data to files and automatically send out emails/text messages
- implement automation and load management systems
- access the system via various devices (smartphones, tablets, PCs, etc)

Scope of **application**:

Residential buildings and small commercial businesses where the need, above all, is to make installation monitoring and control possible from a remote location.

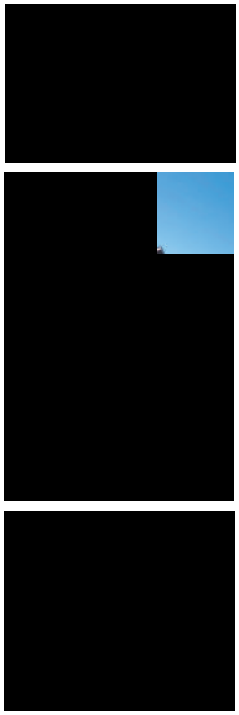
Installation

- maximum expansion possible: **32 devices**
- maximum distance between two devices: **3 m**
- maximum consumption of the system: **1500 mA, divided into 3 interconnected groups**
- maximum consumption of each individual group: **500 mA supplied by a single power supply (Cat.No 4 149 45)**



CX³ EMS
application examples

EXAMPLE 3 "ON-LINE" CONFIGURATION



IDEAL FOR INSTALLATIONS WHERE, IN ADDITION TO THE SERVICES DESCRIBED IN EXAMPLE 2, IT IS POSSIBLE TO INTEGRATE INDIVIDUAL BUS EMS SYSTEMS BETWEEN THEM AND OTHER MODBUS DEVICES ABLE, FOR EXAMPLE, TO:

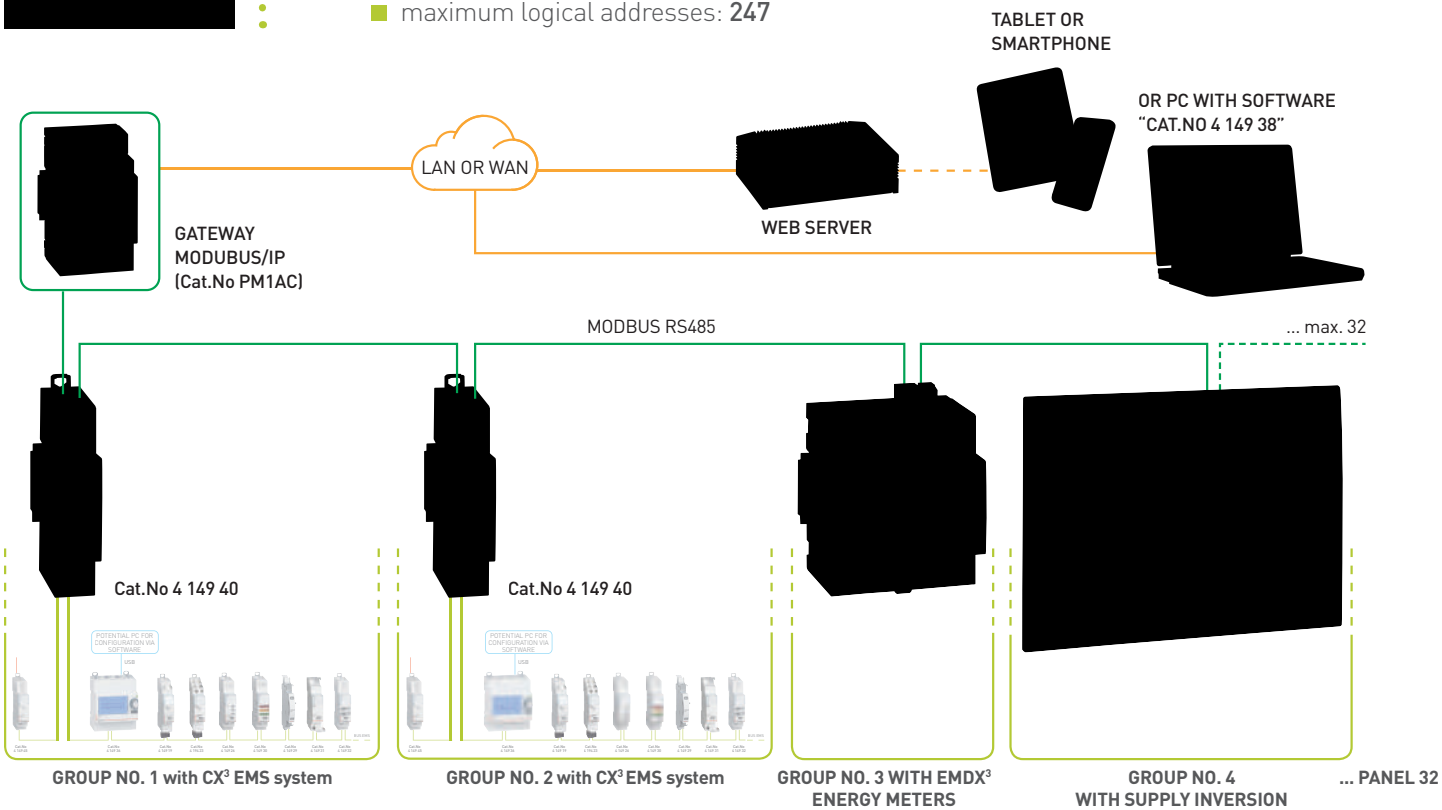
- additional measurement and control functions
- manage and monitor the parameters of electronic protection relays typical of large switches (boxed and open)
- manage and monitor the automatic switching parameters between two power sources, etc

Scope of **application**:

Buildings with simple installations, also consisting of several electrical cabinets, with the need to control and monitor electrical loads.

Installation

- maximum capacity for expansion: **32 MODBUS devices**
- maximum length of RS485 bus: **1000 m**
- maximum logical addresses: **247**



EXAMPLE 4 "MULTI-SITE" CONFIGURATION

IDEAL FOR INDIVIDUAL PLANTS WHERE, IN ADDITION TO THE SERVICES DESCRIBED IN EXAMPLE 3, THERE IS A NEED TO:

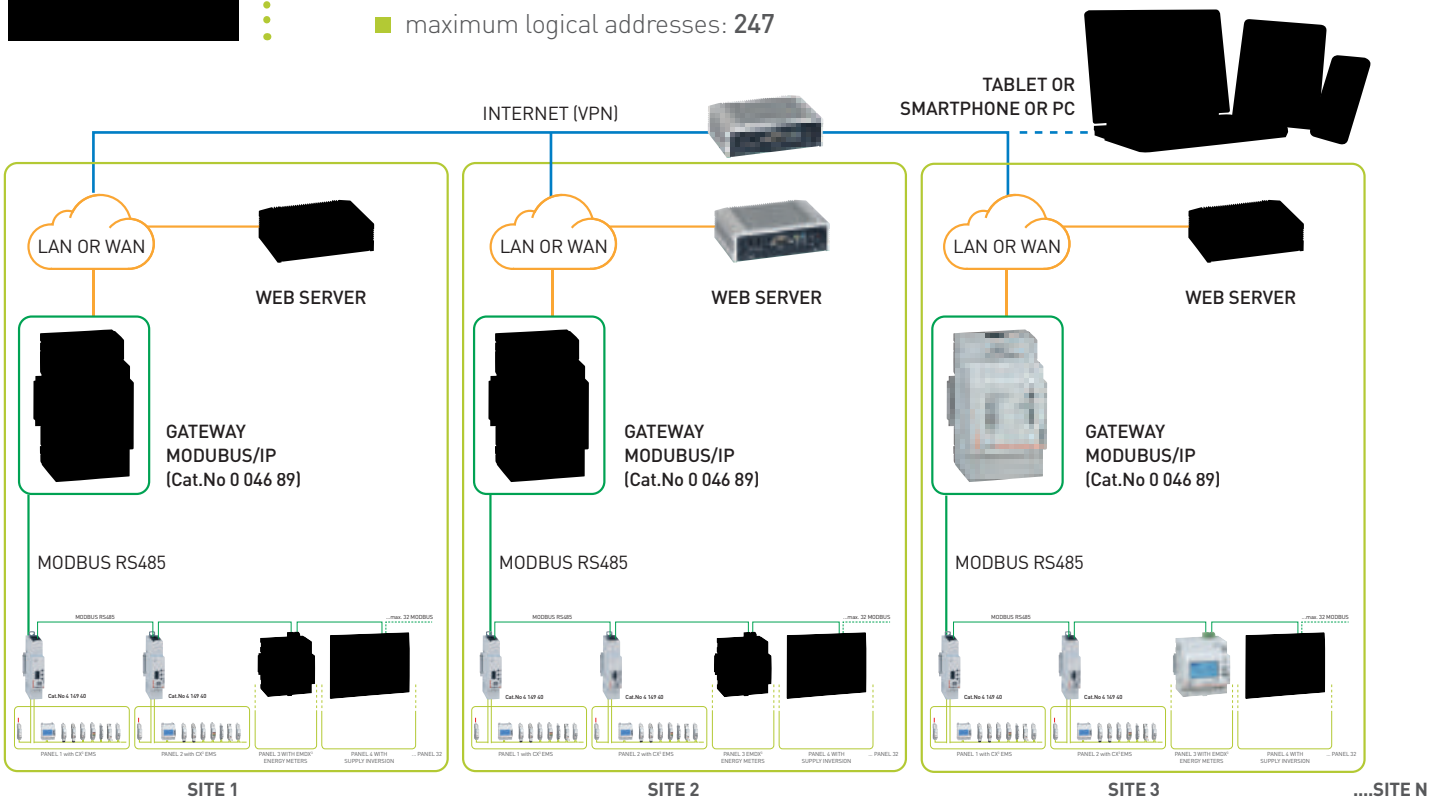
- remotely manage individual installations in different locations with the help of devices (smartphone, tablet, PC, etc) connected to the internet
- have several display levels: local (1 site) or remote, with a multi-site "administrator" view.

Scope of **application**:

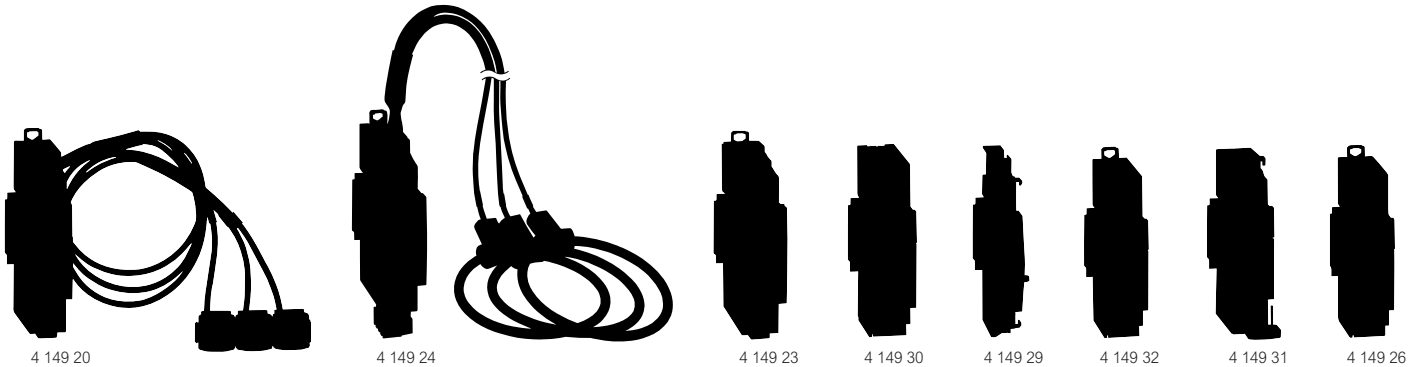
Sites (bank branches, fuel sales points, chains of stores or restaurants, schools, etc) with simple installations requiring supervision by a single administrating entity

Installation

- maximum capacity for expansion: **32 MODBUS devices - 32 devices**
- maximum length of RS485 bus: **1000 m**
- maximum logical addresses: **247**



CX³ energy management system



Conform to IEC/EN 61131-2 (Programmable controllers)
CX³ energy management system enables to measure, control and visualize the state of ⎓ rail mounting protection devices (MCBs, RCCBs, RCBOs, etc...) and head equipment (DMX³ and DPX³), locally ("Stand alone") or remotely. All the modules of the system are equipped with two specific communication ports: one at the backside (for communication rail) and one underneath (for communication patch cords). Power supply with specific module Cat.No 4 149 45
Remote configuration possible with the help of the Energy Management Configuration Software, available for free download via E-Catalogue (giving also access to a 30-day trial version of Energy Management Software Cat.No 4 149 38/39)

Measurement modules

For measuring current, voltage, active/reactive power and other values
Conform to IEC/EN 61557-12
Accuracy: class 0.5

Pack	Cat.Nos		Number of modules
		Direct connection up to 63 A with closed Rogowski coils	
		Allow the passage of prong-type supply busbars (upper side)	
		Supplied with closed Rogowski coils	
1	4 149 18	3 x single-phase measuring module + 3 coils Consumption: 0,418 W - 34,8 mA (12 V =)	1
1	4 149 19[1]	Single-phase measuring module + 1 coil Consumption: 0.409 W - 34.1 mA (12 V ⎓)	1
1	4 149 20[1]	3-phase measuring module + 3 coils Consumption: 0.418 W - 34.8 mA (12 V =)	1
		Direct connection up to 125 A with closed Rogowski coils	
		Allow the passage of prong-type supply busbars (upper side)	
		Supplied with closed Rogowski coils	
1	4 149 21	3-phase measuring module + 3 coils Consumption: 0.418 W - 34.8 mA (12 V ⎓)	1
		Direct connection with open, fexible Rogowski coils	
		Allow the passage of prong-type supply busbars (upper side)	
		Supplied with opened, fexible Rogowski coils and fixing supports for busbars	
1	4 149 22	3-phase measuring module + 3 coils up to 630 A Consumption: 0.418 W - 34.8 mA (12 V =)	1
1	4 149 24	3-phase measuring module + 3 coils up to 1600 A Consumption: 0.418 W - 34.8 mA (12 V =)	1
1	4 149 25	3-phase measuring module + 3 coils up to 3200 A Consumption: 0.418 W - 34.8 mA (12 V =)	1
1	4 149 27	3-phase measuring module + 3 coils up to 6300 A Consumption: 0.418 W - 34.8 mA (12 V =)	1
		Connection with CT	
1	4 149 23	5 A measuring module connected via current transformers (CT) Consumption: 0.391 W - 32.6 mA (12 V ⎓)	1

Extension kits for Rogowski coils

Supplied with connectors

1	4 149 15	Length: 1 m
1	4 149 16	Length: 3 m

Pulse concentrator

Pack	Cat.Nos		Number of modules
1	4 149 26[1]	For collecting and transmitting measurements taken by universal pulse energy meters (water, gas, etc...) Up to 3 pulse circuits Consumption: 0.288 W - 24 mA (12 V ⎓)	1

State reporting modules

		Auxiliary + fault signalling contact	
1	4 149 29[1]	Indicates the position of the contacts and the fault tripping of its associated device. To fit on the left-hand side of DX³ MCBs, RCCBs, RCBOs and isolating switches Consumption: 0.236 W - 19.7 mA (12 V ⎓)	0.5
		Universal signalling module	
1	4 149 30[1]	Equipped with 3 LED lights: green, red and yellow Indicates various type of information, according to selected configuration: contacts position, plugged-in or drawn-out product, etc... Equipped with DIP switches (on the side) allowing product configuration: selection of information type and of the LED behaviour Compatible with ⎓ rail mounting protection devices or head equipment (DMX³ and DPX³) Consumption: 0.377 W - 31.4 mA (12 V ⎓)	1

Universal control module

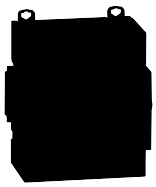
1	4 149 32[1]	2 relays: 240 V ∿ - 6 A Enables to remotely control different electrical loads or motorised controls associated to ⎓ rail mounting protection devices or head equipment (DPX³ MCCBs) Equipped with DIP switches (on the side) allowing product configuration: contact type (NO + NC, 2 NO, etc...) and function (maintained or momentary contact) Consumption: 0.456 W - 38 mA (12 V ⎓)	1

Control and state reporting module

		For CX³ latchnig relays and 1 and 2-module contactors up to 25 A	
1	4 149 31[1]	Indicates the position of the contacts and enables remote control of its associated product Equipped with DIP switches (on the side) allowing product configuration: selection of the main product (latching relay or contactor). To fit on the left-hand side of the CX³ latching relays and contactors Consumption: 0.372 W - 31 mA (12 V ⎓)	1

1: Enables upstream busbar connection

CX³ energy management system (continued)


4 149 36


4 149 38


4 149 48


4 149 49


0 046 89


4 149 07
4 149 01 installed on ⎓ rail

Conform to IIEC/EN 61131-2 (Programmable controllers)
CX³ energy management system enables to measure, control and visualize the state of ⎓ rail mounting protection devices (MCBs, RCCBs, RCBOs, etc...) or head equipment (ACBs, MCCBs, etc...), locally ("Stand alone") or remotely. All the modules of the system are equipped with two specific communication ports: one at the backside (for communication rail) and one underneath (for patch cords).
Power supply with specific module Cat.No 4 149 45
Remote configuration possible with the help of the Energy Management Configuration Software, available for free download via E-Catalogue (giving also access to a 30-day trial version of Energy Management Software Cat.No 4 149 38/39)

Stand alone configuration module

Pack	Cat.Nos	⎓ rail mounting	Number of modules
		Optional module for "stand alone" supervision need Enables to configure, test and control CX³ energy management system and to visualize supervision data No computer or IP connection required Consumption: 0.438 W - 36.5 mA (12 V ⎓)	
1	4 149 36[1]	Menu languages: English, French, Italian, Flemish, Polish, Spanish, German, Portuguese and Turkish	4
1	4 149 37[1]	Menu languages; English, Arabic, Chinese, Greek, and Russian	4

Energy management software for 1 computer (user licence key)

Pack	Cat.Nos	
		Allows remote configuration, test, control and visualization of data collected from EMDX³ electrical energy meters and multi-function measuring units and CX³ energy management system on one computer connected to the network 30-day free trial version available for download via E-Catalogue
1	4 149 38	Software licence agreement (user key) for 32 Modbus adresses or 32 pulse modules
1	4 149 39	Software licence agreement (user key) 255 Modbus adresses or 255 pulse modules

Energy management multi-support web servers

Allow remote configuration, test, control and visualization, via a web browser on PCs, smartphones, web viewers, tablet computers, of data collected from: protection devices (DX³ add-on modules with integrated measurement control unit, DPX³ and DMX³), EMDX³ electricity meters and multi-function measuring units, CX³ energy management system and Green'up charging stations for electric vehicles.

Pack	Cat.Nos	⎓ rail mounting	Number of modules
		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 to be ordered separately	
1	4 149 47	For 10 Modbus adresses or 10 pulse modules	4
1	4 149 48	For 32 Modbus adresses or 32 pulse modules	4
		Fixing on plate	
1	4 149 49	For 255 Modbus adresses or 255 pulse modules Supplied with external power supply and fixing brackets	

Communication interfaces

Pack	Cat.Nos	RS485 / CX³ energy management system	Number of modules
1	4 149 40	RS485 / CX³ energy management system conversion Consumption: 0.344 W - 28.7 mA (12 V ⎓)	1
		RS485 / Ethernet	
1	0 046 89	RS485 / Ethernet conversion (for connection to an IP network)	3

Power supply module

Pack	Cat.Nos		Number of modules
1	4 149 45	500 mA 12 V ⎓ stablized power supply module for CX³ energy management system	1

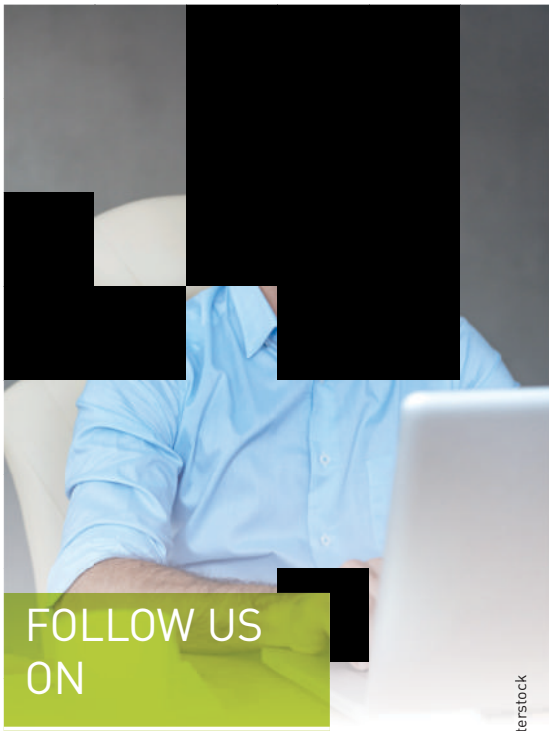
Connection accessories

Pack	Cat.Nos	
		Communication rails To be fitted on ⎓ rail or spacer Allows data transmission between the different modules of CX³ energy supervision system
1	4 149 01[2]	18 modules
1	4 149 02[2]	24 modules
1	4 149 03[2]	36 modules
		Communication patch cords Allows data transmission between the different modules of CX³ energy supervision system Can be used instead of communication rails or to create a link between two rows (individually connected with communication rails)
1	4 149 07	Length 250 mm (10 patch cords)
1	4 149 08	Length 500 mm (10 patch cords)
1	4 149 09	Length 1000 mm (5 patch cords)
		Communication patch cord connector
1	4 149 10	Enables to extend communication patch cords length by clipping them together Max. length: 3 m
		Plastic cover for communication rail
1	4 149 14	Must be used for protection of the unused parts of the communication rail Length: 36 modules Can be cut to the required length. Fixing: direct clip on to the rail

1: Enables upstream busbar connection
2: For other lengths, please consult us

Notes

Notes



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