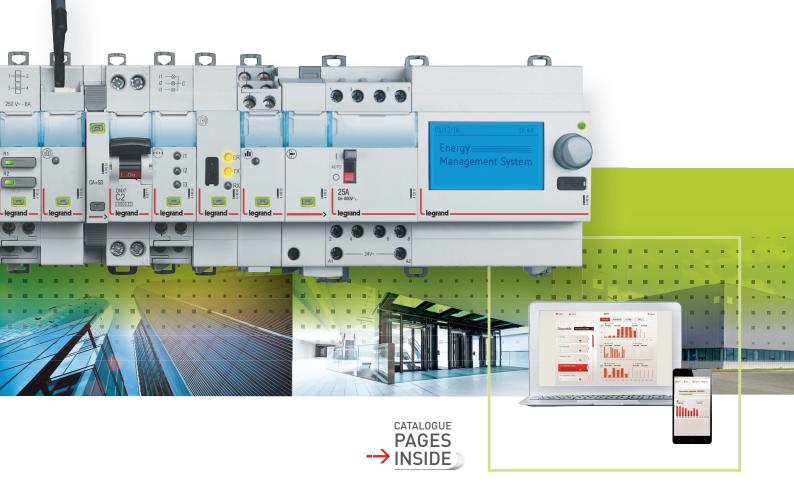


A UNIVERSAL & INNOVATIVE ENERGY MANAGEMENT SYSTEM







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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		CX3 EMS - ENERGY MANAGEMENT SYSTEM	M PRODUCT GUIDE 1

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.



AVARENESS 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.





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.



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



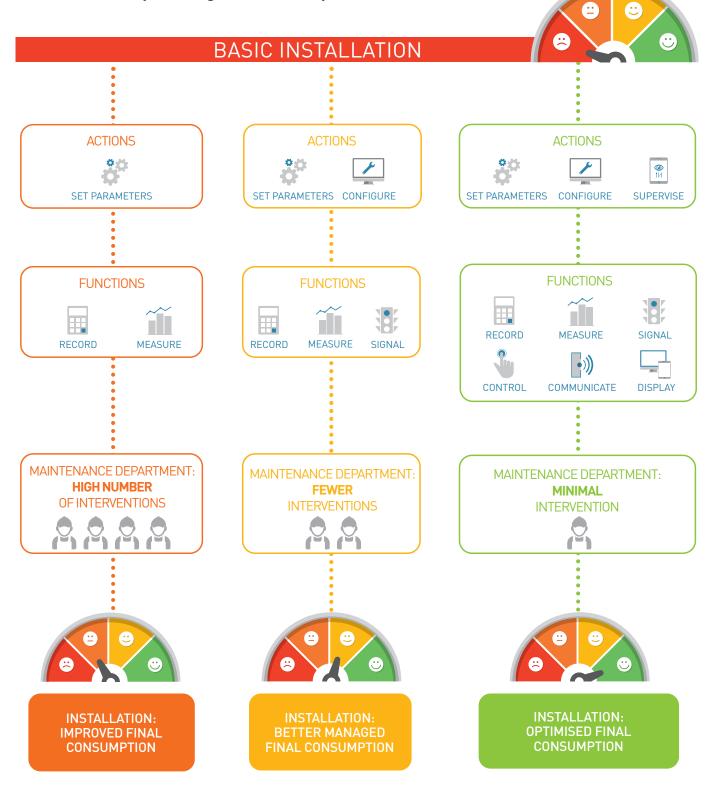


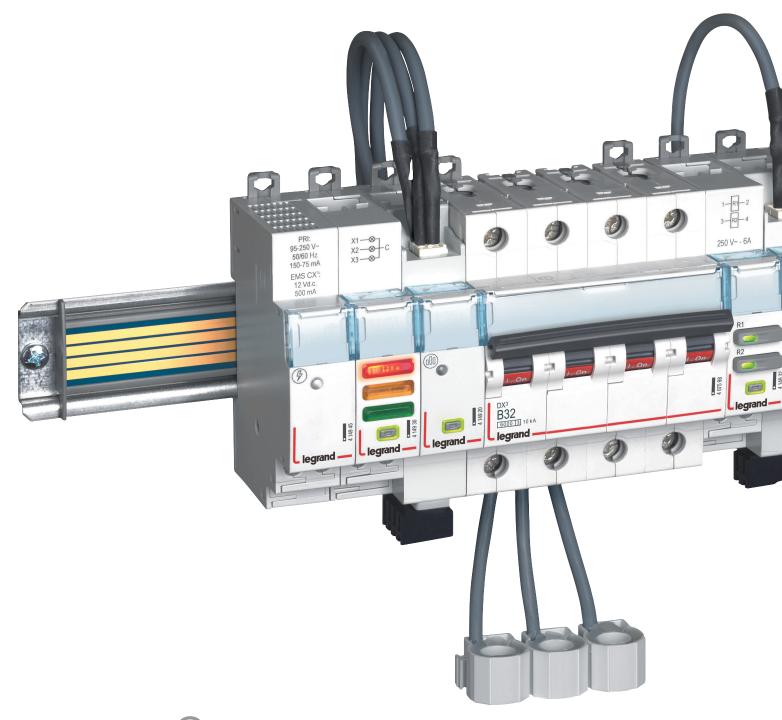
- determine annual energy needs to define how consumption is distributed
- analyse the trend over time to control performance
- log events to prevent critical issues



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.

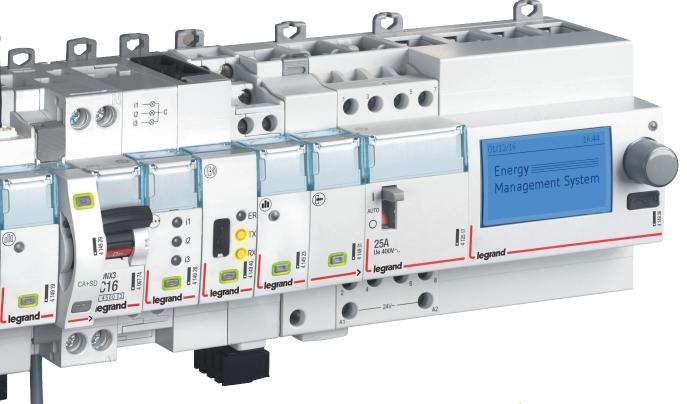




CX³ EMS an innovative supervision system

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**

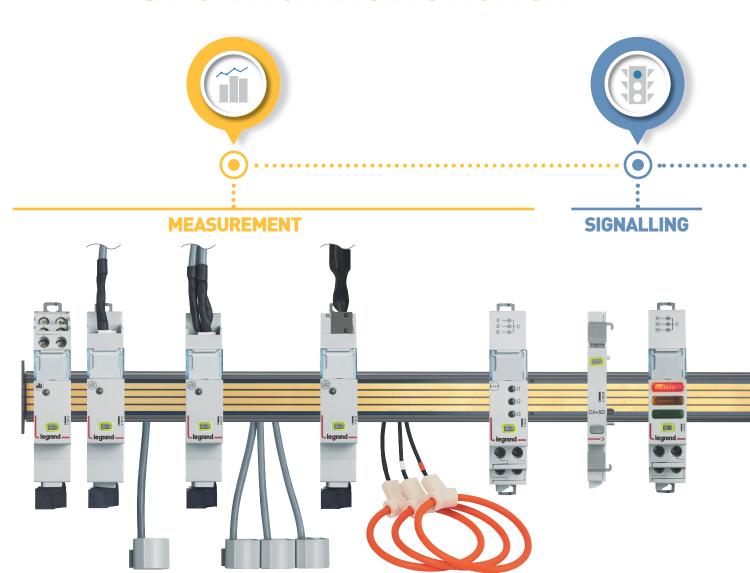
The CX³ EMS modules are compatible with any type of protection device (modular or power), whatever the brand.

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



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 $\boldsymbol{\phi}$
- 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.

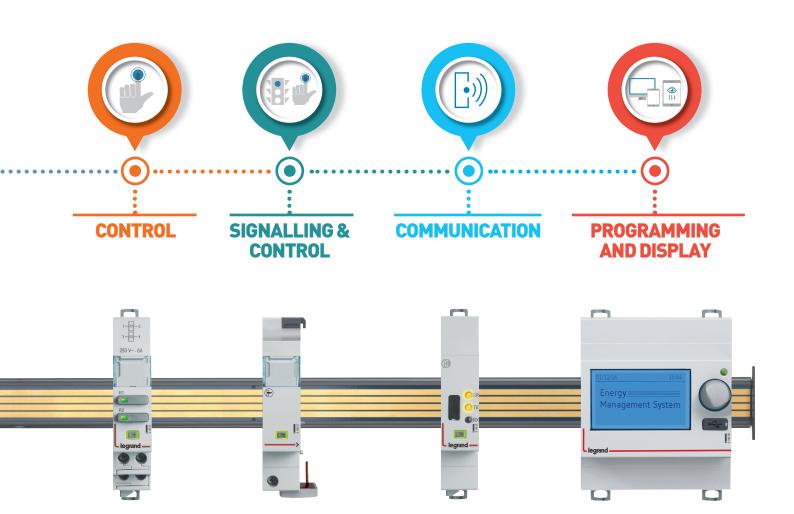
Up to 3 pulse circuits.

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.



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. 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 pulseoperated latching relays.

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.

Stand-alone configuration module for controlling the entire installation, locally, in the enclosure:

- system configuration
- test
- consumption display
- alarm control
- device control
- memorising alarms

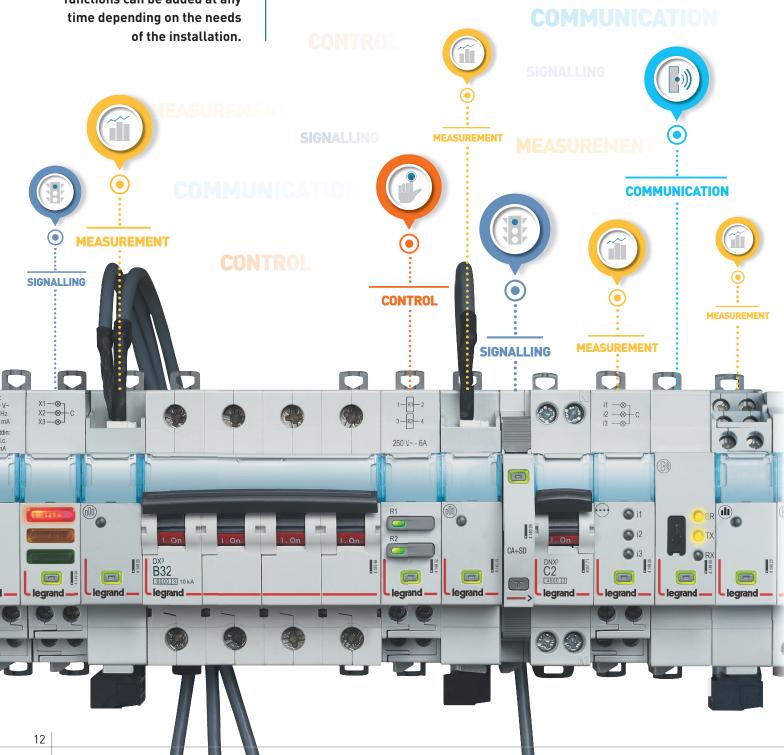
CX³ EMS

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.

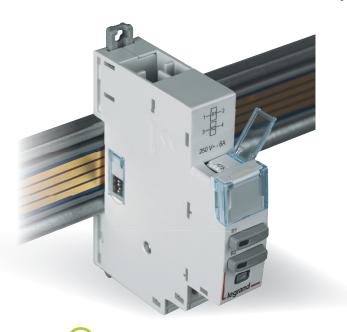
COMMUNICATION RAIL PATCH CORDS

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

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.



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 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.





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.









CONFIGURING THE ADDRESS

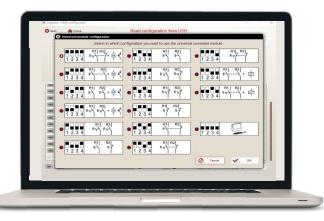
The software can be used to detect all EMS CX³ modules in the system and assign them an address automatically. The numerical selector switches must be in position "0".





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.



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

(i)

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



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



"STAND-ALONE" CONFIGURATION







IDEAL FOR INDIVIDUAL INSTALLATIONS

WHERE THERE IS A LOCAL NEED TO:

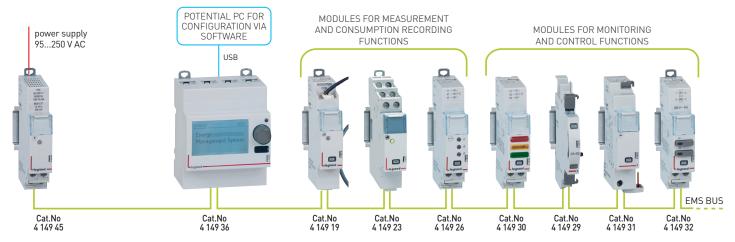
- monitor parameters (electricity, water, gas, heat, etc.) during consumption and/or production
- check the status of various devices (switches, contactors, relays, end runs, etc)
- locally control various devices (switches, contactors, relays, etc)
- register alarms (up to 20)
- generate simple load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







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)

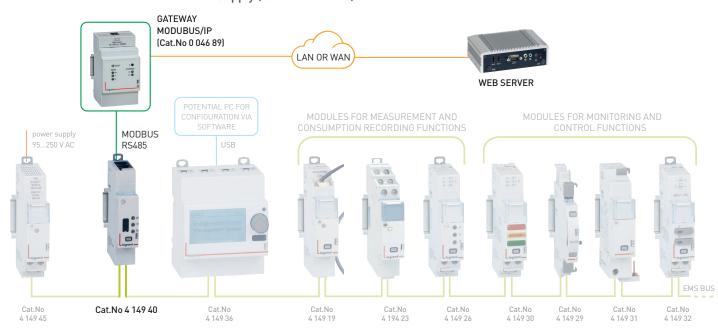


Scope of application:

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



"ON-LINE" CONFIGURATION







GATEWAY MODUBUS/IP

GROUP NO. 1 with CX3 EMS system

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.

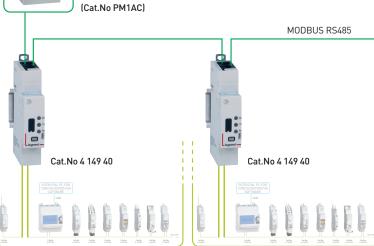
Installation

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

GROUP NO. 2 with CX3 EMS system

TABLET OR SMARTPHONE







GROUP NO. 3 WITH EMDX³ ENERGY METERS GROUP NO. 4
WITH SUPPLY INVERSION

... PANEL 32





"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.

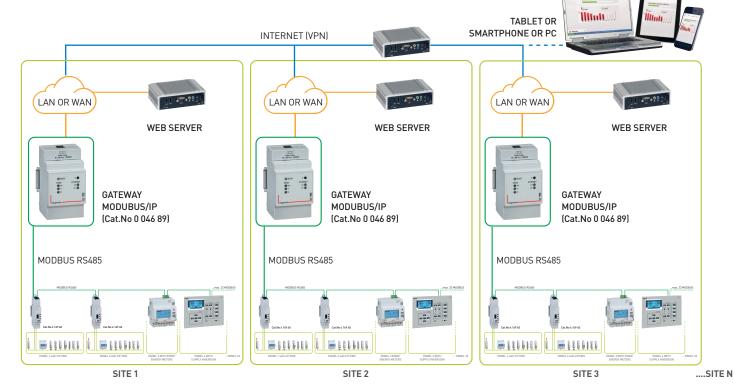


Sites (bank branches, fuel sales points, chains of stores or restaurants, schools, etc) with simple installations requiring supervision by a single administrating entity

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, RCBs, 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)

Pack	Cat.Nos	Measurement modules		Pack	Cat.Nos	Pulse concentrator
		For measuring current, voltage, active/reac power and other values Conform to IEC/EN 61557-12 Accuracy: class 0.5 Direct connection up to 63 A with closed Rogowski coils Allow the passage of prong-type supply	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 =)
		busbars (upper side)				State reporting modules
1	4 149 18	+ 3 coils Consumption: 0,418 W - 34,8 mA (12 V =)	1	1	4 149 29¹	Auxiliary + fault signalling contact Indicates the position of the contacts and the fault tripping of its associated device.
1	4 149 19 ¹ 4 149 20 ¹	Single-phase measuring module + 1 coil Consumption: 0.409 W - 34.1 mA (12 V =) 3-phase measuring module + 3 coils Consumption: 0.418 W - 34.8 mA (12 V =)	1			To fit on the left-hand side of DX³ MCBs, RCCBs, RCBOs and isolating switches Consumption: 0.236 W - 19.7 mA (12 V =)
1	4 149 21	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 1	1	4 149 30¹	Universal signalling module 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)
	4.440.00	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				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	4 149 22	3-phase measuring module + 3 coils up to 630 A	1			Universal control module
1	4 149 24	Consumption: 0.418 W - 34.8 mA (12 V =) 3-phase measuring module + 3 coils up to 1600 A Consumption: 0.418 W - 34.8 mA (12 V =)	1	1	4 149 32 ¹	of moo 2 relays: 240 V ∼ - 6 A Enables to remotely control different electrical loads or motorised controls
1	4 149 25	3-phase measuring module + 3 coils up to 3200 A Consumption: 0.418 W - 34.8 mA (12 V =)	1			associated to rail mounting protection devices or head equipment (DPX³ MCCBs) Equipped with DIP switches (on the side)
1	4 149 27	3 coils up to 6300 Å Consumption: 0.418 W - 34.8 mA (12 V =)	1			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	4 149 23	Connection with CT 5 A measuring module connected via	1			Control and state reporting module
		current transformers (CT) Consumption: 0.391 W - 32.6 mA (12 V =)				For CX ³ latchnig relays and 1 and Num
1		Extension kits for Rogowski coils Supplied with connectors Length: 1 m Length: 3 m		1	4 149 31 ¹	2-module contactors up to 25 A 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 CX ³ latching relays and contactors Consumption: 0.372 W - 31 mA (12 V =)

^{1:} Enables upstream busbar connection



CX³ energy management system (continued)















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)

also acces	ss to a 30	-day trial version of Energy Management S	Software Cat.	No 4 149	38/39)	
Pack	Cat.Nos	Stand alone configuration module		Pack	Cat.Nos	Communication interfaces
Option superv Enable		rail mounting Optional module for "stand alone" supervision need Enables to configure, test and control	Number of modules	1	4 149 40	RS485 / CX³ energy management system RS485 / CX³ energy management system conversion Consumption: 0.344 W - 28.7 mA (12 V =)
		CX³ energy management system and to visualize supervision data No computer or IP connection required	,	1	0 046 89	RS485 / Ethernet RS485 / Ethernet conversion (for 3 connection to an IP network)
1	4 149 36 ¹	Consumption: 0.438 W - 36.5 mA (12 V = Menu languages: English, French,	4			Power supply module Number of modules
		Italian, Flemish, Polish, Spanish, German, Portuguese and Turkish Menu languages; English, Arabic, Chinese, Greek, and Russian	4	1	4 149 45	500 mA 12 V = stablized power supply module for CX³ energy management system
		Energy management software for				Connection accessories Communication rails
1 1		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 8 Software licence agreement (user key) for 32 Modbus adresses or 32 pulse modules 9 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		1 1 1 1 1 1	4 149 02 ² 4 149 03 ² 4 149 07 4 149 08 4 149 09 4 149 10	To be fitted onrail or spacer Allows data transmission between the different modules of CX³ energy supervision system 18 modules 24 modules 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) Length 250 mm (10 patch cords) Length 500 mm (10 patch cords) Length 1000 mm (5 patch cords) Communication patch cord connector Enables to extend communication patch cords length by clipping them together Max. length: 3 m Plastic cover for communication rail Must be used for protection of the unused parts of the communication rail
		for electric vehicles. rail mounting 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	Number of modules			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
1	4 149 47	ordered separately For 10 Modbus adresses or 10 pulse	4			
1		modules For 32 Modbus adresses or 32 pulse	4			
1		modules Fixing on plate For 255 Modbus adresses or 255 pulse m Supplied with external power supply and	nodules			

Notes			

Notes			



D legrand

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