SELECTION GUIDE

ENERGY MANAGEMENT

THE GLOBAL SPECIALIST IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURES

legrand®

In the modern context where environmental issues are now a priority, it is now necessary to **reduce our greenhouse gas emissions**.

Industrial, commercial buildings, or even residential housing, are subject to new **standards, directives or decrees** with a view to limiting their environmental impact by reducing their energy consumption in favor of **better energy performance**.

Computer equipment, lighting and temperature management (heating or air conditioning) are among the most energy-consuming appliances.

Reducing energy consumption means reducing the associated costs, which is why measurement is the basis of any diagnosis. Knowing your energy consumption is the first step towards **energy efficiency**. Monitoring and taking action are the next steps.

Legrand offers complete solutions to meet each of these needs. Whether through measuring units, energy meters or energy management systems, the solutions offered make it possible to display information on energy consumption, reactive power, harmonic disturbances, or any other electrical values... but also to monitor the various statuses, remotely control circuits and program actions such as alarms, plan corrective actions thanks to diagnostics... in a word: **«supervise»**.

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STANDARDS AND REGULATIONS

European directive 2012/27/UE

The obligation to carry out an energy audit for large-scale companies, provided for by the European directive 2012/27/EU relating to energy efficiency, was set by law no. 2013-619 of July 16, 2013 containing various provisions for adapting to European Union law in the field of sustainable development.

KEY DATES

Since December 5, 2015, all large-scale companies concerned must be able to justify, at any time, to have carried out an **energy audit** according to the requirements of the NF EN 16247 standards.

This audit must be renewed every 4 years.

WHO

This directive concerns all companies that have:

→ **either a workforce of more than 250 employees,**

→ **or annual sales exceeding 50 million euros and a balance sheet of more than 43 million euros,**

Exception: ISO 50001 certified companies are exempt from this obligation.

REQUIREMENTS

This energy audit must be carried out on a perimeter representing at least 80% of the company's energy bills, failing which penalties of up to 2% of turnover may be imposed.

If the company is ISO 50001 certified, it must cover 80% of the energy bill. Otherwise, it will have to carry out an additional audit on the activities not covered.

Companies are then required to electronically submit the results of their audit to the energy audit collection platform operated by ADEME (French Environment and Energy Management Agency).

MEASUREMENT

The energy audit will be carried out on the basis of the energy performance of the building(s) concerned. This requires the identification of significant energy uses in order to determine opportunities for improvement.

An energy inventory will be carried out on the basis of an evaluation of consumption and identification of uses. The goal is to collect and analyze the field data needed for the energy review and the development of the energy management system.

ISO 50001 certification

ISO 50001 is a voluntary international standard developed by ISO (International Organization for Standardization).

It defines the requirements for the implementation, operation, maintenance and improvement of an Energy Management System (EnMS) by an organization.

KEY DATES

→ Effective **June 15, 2011**.
→ The **second version** of ISO 50001, published on **August 21, 2018**, concerns the structure of the document, which is now similar to that of other management system standards in order to facilitate cross-referencing.

WHO

This certification **can be applied to all types and sizes of organizations**, regardless of their geographical, cultural or social location.

An ISO 50001-compliant company will be able to demonstrate the existence of a sustainable EnMS.

REQUIREMENTS

→ a commitment to continuous improvement in terms of energy efficiency,
→ appointment of a qualified energy management specialist,
→ the development of a management plan,
→ an assessment of the main energy applications,
→ the setting up of energy performance indicators and targets,
→ the setting up of action plan(s),
→ all staff must undergo training in how best to improve energy efficiency,
→ the results should be evaluated and sent out to all staff on a regular basis.

The European institutions have chosen ISO 50001 as a reference method to help achieve the EU's energy saving goals within companies and public organizations.

In France, several regulatory texts refer to ISO 50001 compliance certification, including the Energy Code, which provides for an exemption from the mandatory energy audit for large certified companies.

MEASUREMENT

As for the 2012/27 directive, ISO 50001 does not require specific measurements by type of use or circuit.

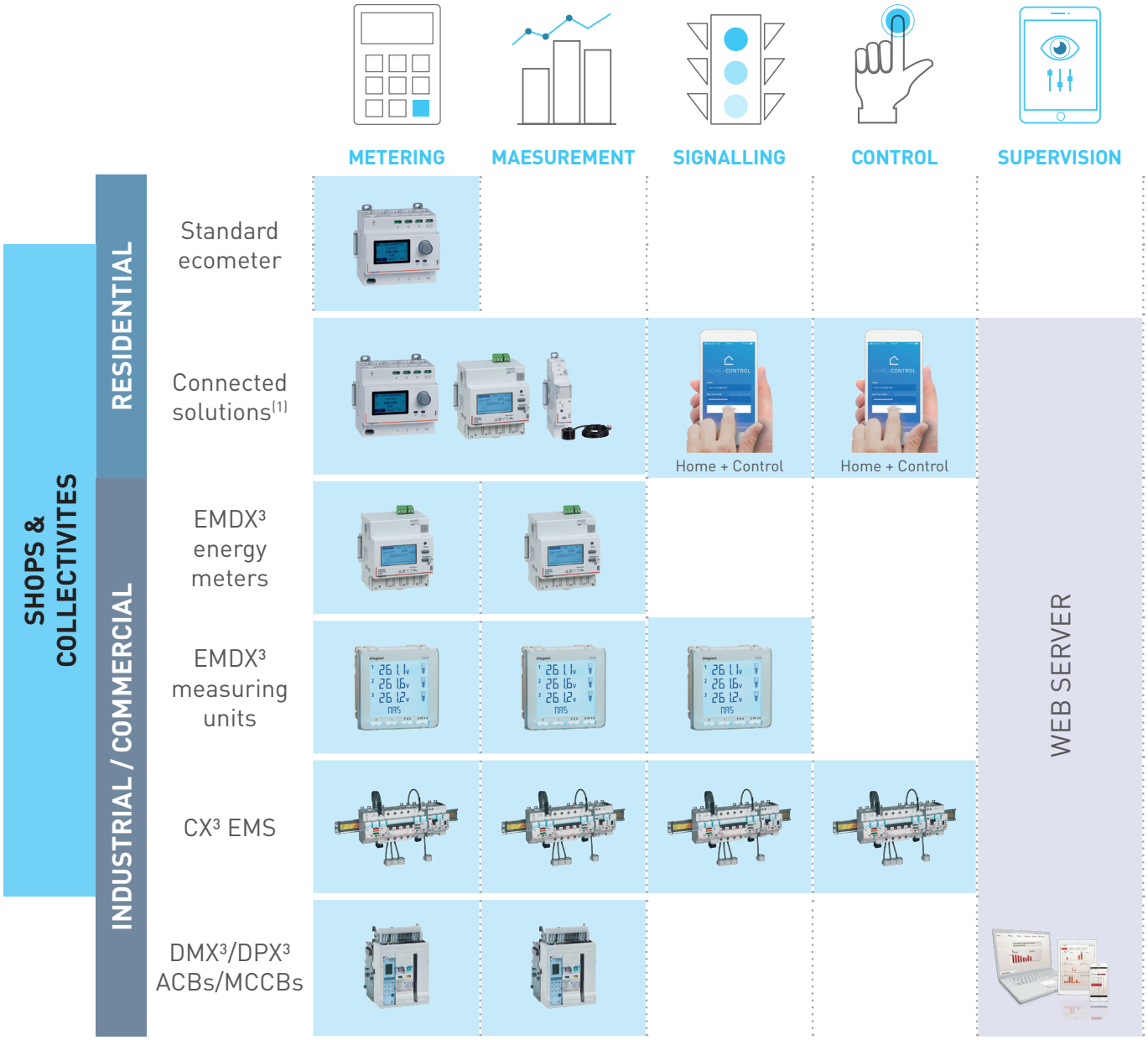
However, in order to construct the energy management system for buildings, it is important to know which are the most energy-consuming items in order to identify potential sources of improvement.

Use of a measurement and supervision system ensures continuous improvement in the company's energy performance.

ENERGY MANAGEMENT

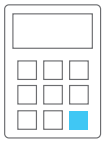
Overview

Maximized functions and actions = minimized interventions and consumption.
Indeed, in an electrical infrastructure, a greater number of functions and actions reduces the number of human interventions and considerably optimises final consumption.



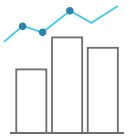
(1) Connected outlets, connected cable outlet, connected latching relay, connected contactor, connected energy meter, connected eco-meter (launching in 2021) and connected load shedder (launching in 2021)

Definitions



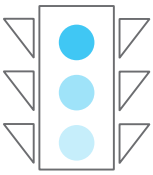
METERING

Recording the electricity consumed by a circuit. This is the basic function which is available on all metering devices.



MEASUREMENT

Measuring electrical values (current, voltage, power, harmonic distortion, etc) or **analogue values** (temperature) to check the installation is working properly.

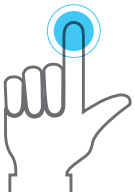


SIGNALLING

Checking locally (LEDs, display unit, touch screen, etc) or remotely (LEDs, display unit, PLC, PC, tablet, smartphone, etc):

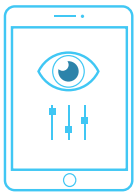
→ the on/off status of one or more devices and/or circuits

→ any faults such as circuit breaker tripping, min. or max. threshold overrun, etc ...



CONTROL

Managing control devices such as relays, contactors, circuit breaker motorised controls, load shedding/ restoration, etc following a manual or automatic command, fault, etc.



SUPERVISION

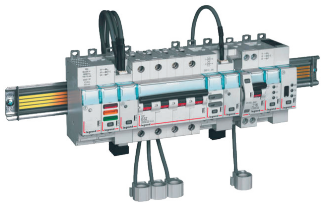
Supervision is a **computerised control and monitoring technique** for processes. In the measurement field, it is used as an umbrella term for all the aforementioned functions (display, monitor, control, set parameters, program).

Supervision concerns acquisition of data (measurements, alarms, status feedback, etc) and process control (circuit breaker remote control, etc). A supervision system helps control and optimise energy consumption at any time on the whole of the electrical network. It monitors all the equipment with respect to safety, control, speed of intervention and continuity of service.

Data retrieved concerning the equipment operating status, distributed power measurements and consumption can be exploited in order to set up a technical energy management solution.

SOLUTIONS FOR EVERY PROJECT

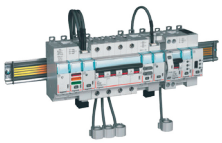
As a user I would like to	Main distribution board / Head of the electrical installation Industrial / Service sector		
			
	DPX³ / DMX³	**EMDX³ ENERGY METERS**	**EMDX³ MEASURING UNITS**
METERING AND MEASUREMENT			
Energies	+	✓ OK	✓
Double tariff		✓ OK	✓
Rebilling		✓ OK	+
Basic electrical values	+	✓	✓ OK
Critical electrical data (harmonics ...)			✓ OK
Power quality			✓ OK
SIGNALLING			
Device status	+		+
Measurement threshold			+
Temperature			+ OK
CONTROL			
Devices	+*		+
Load shedding			+
Remotely	+*		
Automatic actions			
COMMUNICATION			
RS485 Modbus	✓	✓	✓
Smartphone App			
IP (LAN/WiFi)			

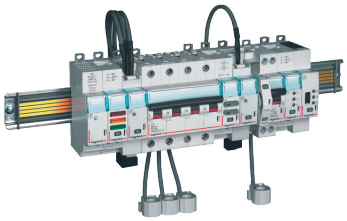
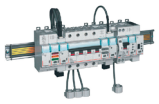
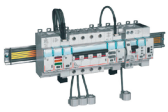
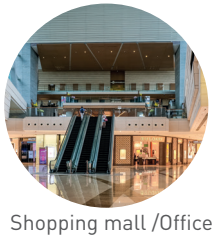
	Electrical panel (housing)
	
CX³ EMS	CONNECTED SOLUTIONS(1)
METERING AND MEASUREMENT	
✓	✓ OK
	✓ OK only with the smart Ecometer
✓	✓
✓	
SIGNALLING	
✓ OK	✓ OK via App.
✓ OK	✓ OK notifications
	+
CONTROL	
✓ OK	✓ OK
✓ OK	✓ OK with the smart load shedder
+ OK	✓ OK
✓ OK	✓ OK planning
SUPERVISION	
✓	
	✓ OK
	✓ OK

+ Option or via other devices
✓ Product feature
OK Recommended product for this function
*Via I/ O card

(1) Connected outlets, connected cable outlet, connected latching relay, connected contactor, connected energy meter, connected eco-meter (launching in 2021) and connected load shedder (launching in 2021).

SOLUTIONS FOR EVERY PROJECT

	As a user I would like to	STANDARD SOLUTION Products	 Product benefits
Private homes	Comply with regulations To better know my consumptions in order to optimise them To be able to control circuits remotely	 Ecometer	• Measurement of 5 circuits • Consumption display • Direct reading on product
Small office buildings	Comply with regulations To better know my consumptions in order to optimise them	 EMDX³ energy meter	• No programming • Direct reading on product • Installation cost < profitable from 6 measuring points • MID certification for rebilling
Collective housing / small office buildings	Track my consumption for optimisation purposes Charge back some consumption (EVSE, rental ...) Control critical data (reactive, max power)	 EMDX³ measuring unit  EMDX³ energy meter	• Easy programming • Direct reading on product • Centralization of other measurements (water and gas) • Cost-effective installation from 6 pts of measurement
Commercial / Service sector	Supervise all consumption Control critical data (reactive, max power) Know the status of my high-priority circuits To be able to control certain circuits remotely	 EMDX³ measuring unit  Web server  EMDX³ energy meter	• Control via Modbus • Remote access to consumption data • Power quality measurement
Industrial and service sector	Supervise all consumption To control the quality of energy of my installation Know the status of my high-priority circuits To be able to control remotely Act automatically to reduce my consumption and avoid power overruns To be able to notify me of dysfunctions Be autonomous in the energy management of my building	 CX³ EMS  DMX³ ACBs  EMDX³ measuring unit	

ADVANCED OR SMART SOLUTION		APPLICATION EXAMPLE
Products	**Product benefits**	
 Connected solutions(1)	• Measurement and display of circuit consumption and/or loads via the Home + Control App • Remote control • Scalable and smart solution • New or existing installation	 Private housing
 CX³ EMS	• Centralised visualisation • Installation cost > cost-effective from 6 measuring points • Scalable solution • Existing installation	 Small business
 CX³ EMS  EMDX³ energy meter	• Centralised visualisation • Installation cost > cost-effective from 6 measuring points • Scalable solution • Centralisation other measures (water and gas) • Optimisation of consumption per control (load shedding)	 Town hall, school
 CX³ EMS  Web server	• Complete system for new and existing • Remote data access • Scalable solution • Remote status and control of circuits possible from the same interface	 Collective housing
 Web server  EMDX³ energy meter	• Remote data access • Open to third party SCADA* • Scalable solution • Remote status and control of circuits possible from the same interface • Power quality measurement *Supervisory Control And Data Acquisition	 Shopping mall /Office  Industry

(1) Connected outlets, connected cable outlet, connected latching relay, connected contactor, connected energy meter, connected eco-meter (launching in 2021) and connected load shedder (launching in 2021)

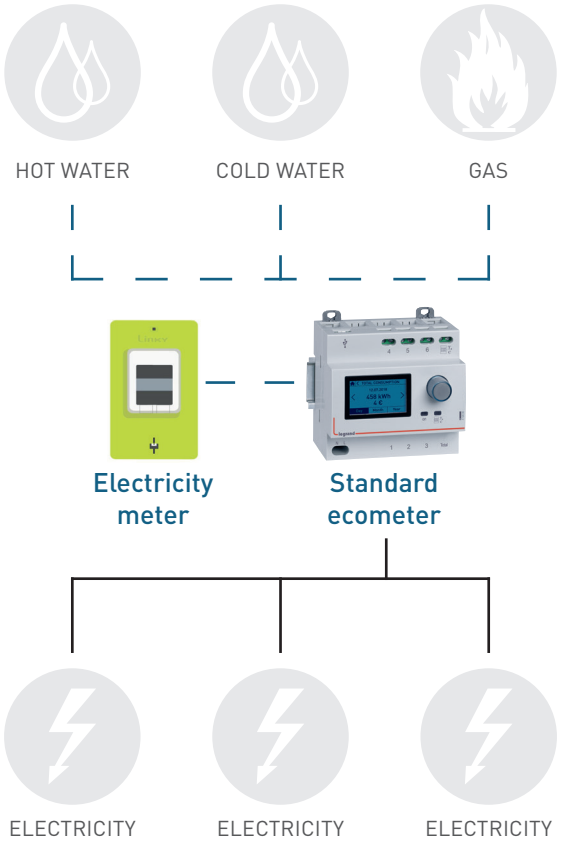
WHAT DO YOU WANT TO CARRY OUT AS A **HOME** OR **SMALL BUSINESS** OWNER?

«I want to comply with the regulations and better understand my consumption in order to optimise it.»

SINGLE-PHASE SOLUTION

Standard solution

Standard ecometer



→ Measurement of energy consumption per circuit (heating, outlets, DHW, water...)
→ Direct visualisation on the device

Measurement
Gathering

SINGLE-PHASE SOLUTION

Connected solution
Measurement only

Home + Control

HOT WATER COLD WATER GAS

Electricity meter

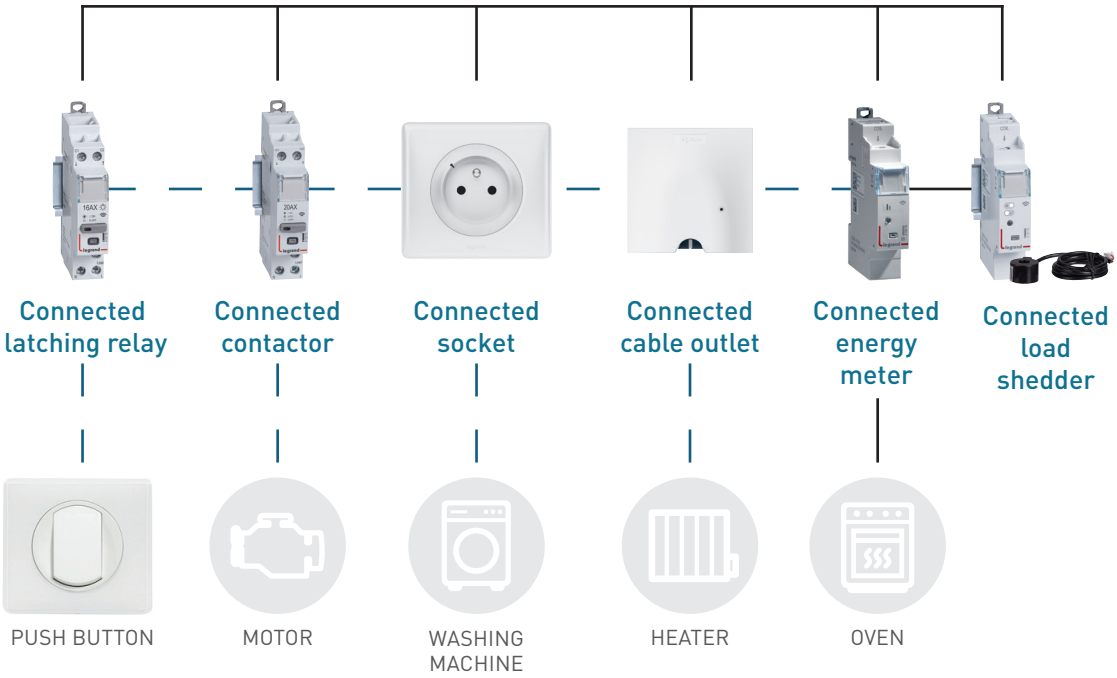
Connected ecometer

ELECTRICITY ELECTRICITY ELECTRICITY ELECTRICITY

→ Scalable system (can be integrated into the smart ecosystem)
→ Measurement of energy consumption per circuit (heating, outlets, DHW, ...)
→ Visualisation and display of consumption by the Home + Control App

Mesurement
Gathering

Connected solution
Complete system



→ Smart system
→ Instantaneous power measurement and daily and monthly consumption monitoring through the Home + Control App (notifications)
→ Remote circuit control and supervision

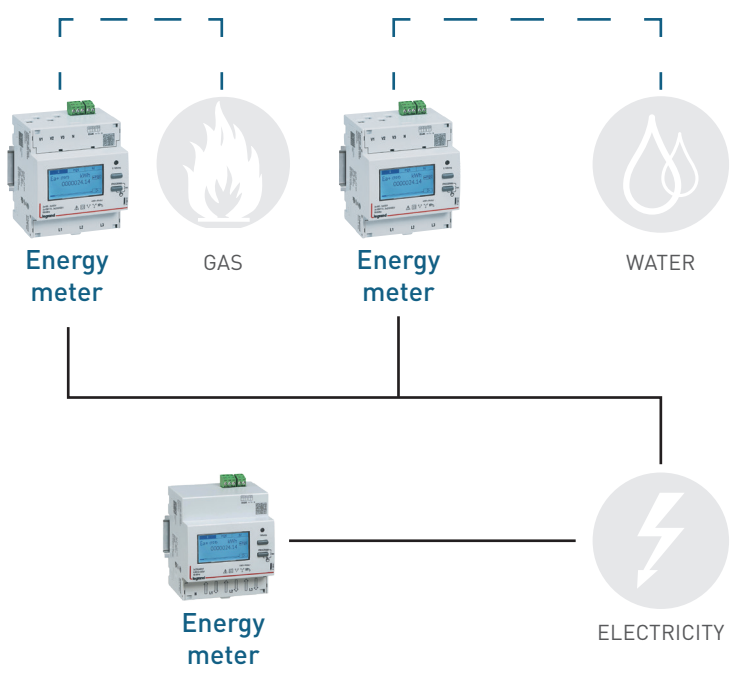
Mesurement
Control/Gathering

WHAT WOULD YOU LIKE TO CARRY OUT IN A **TOWN HALL**, A **SCHOOL** OR A **SMALL SHOP**?

«I want to comply with the regulations and better understand my consumption in order to optimise it.»

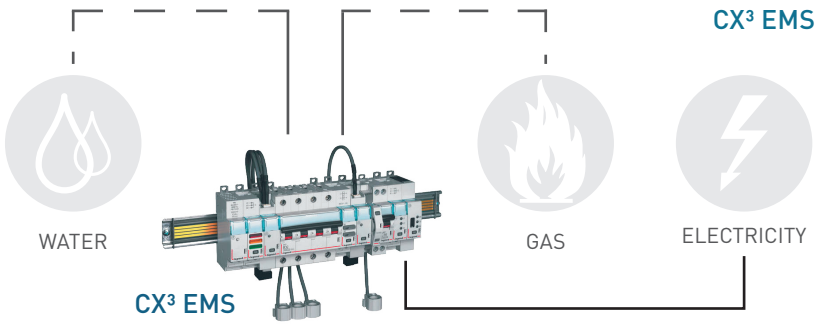
THREE-PHASE SOLUTION

Standard solution



→ Measurement of energy consumption by zone or circuit (lighting, heating, outlets, water...)
→ Direct visualisation on the devices

Advanced solution



→ Scalable universal system (visualisation of products of all brands)
→ Measurement of energy consumption by zone or circuit (lighting, heating, outlets, water...)
→ Centralised visualisation on mini configurator

Mesurement

Gathering

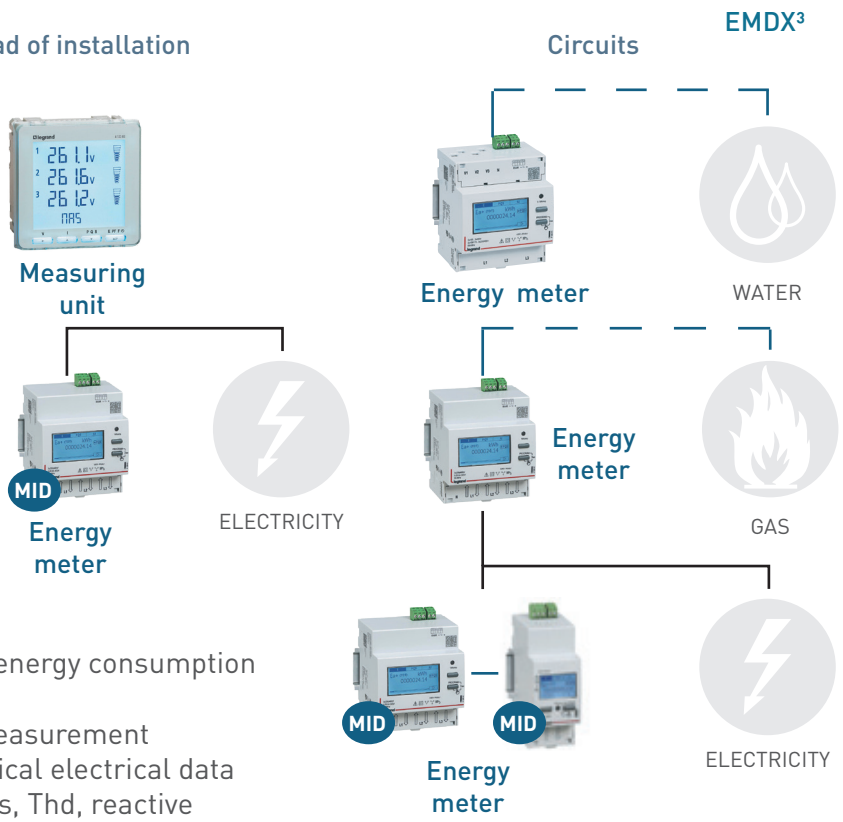
WHAT WOULD YOU LIKE TO CARRY OUT IN A **COLLECTIVE HOUSING** OR A **SUPERMARKET**?

«I want to monitor my consumption in order to optimise it and to bill back some of it (EVSE, rental ...).

I also want to control critical data (reactive and maximum power).»

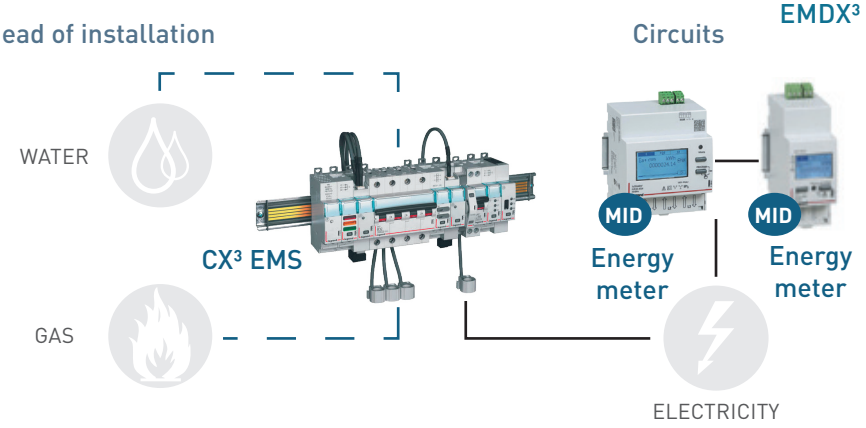
SINGLE/THREE-PHASE SOLUTION

Standard solution



→ Measurement of energy consumption by zone or circuit
→ Electrical data measurement
→ Monitoring of critical electrical data (power, harmonics, Thd, reactive energy...)

Advanced solution



→ Scalable universal system (visualisation of products of all brands)
→ Measurement of energy consumption by zone or circuit
→ Measurement and monitoring of critical electrical data (power, harmonics, Thd, reactive energy...)

Mesurement
Gathering

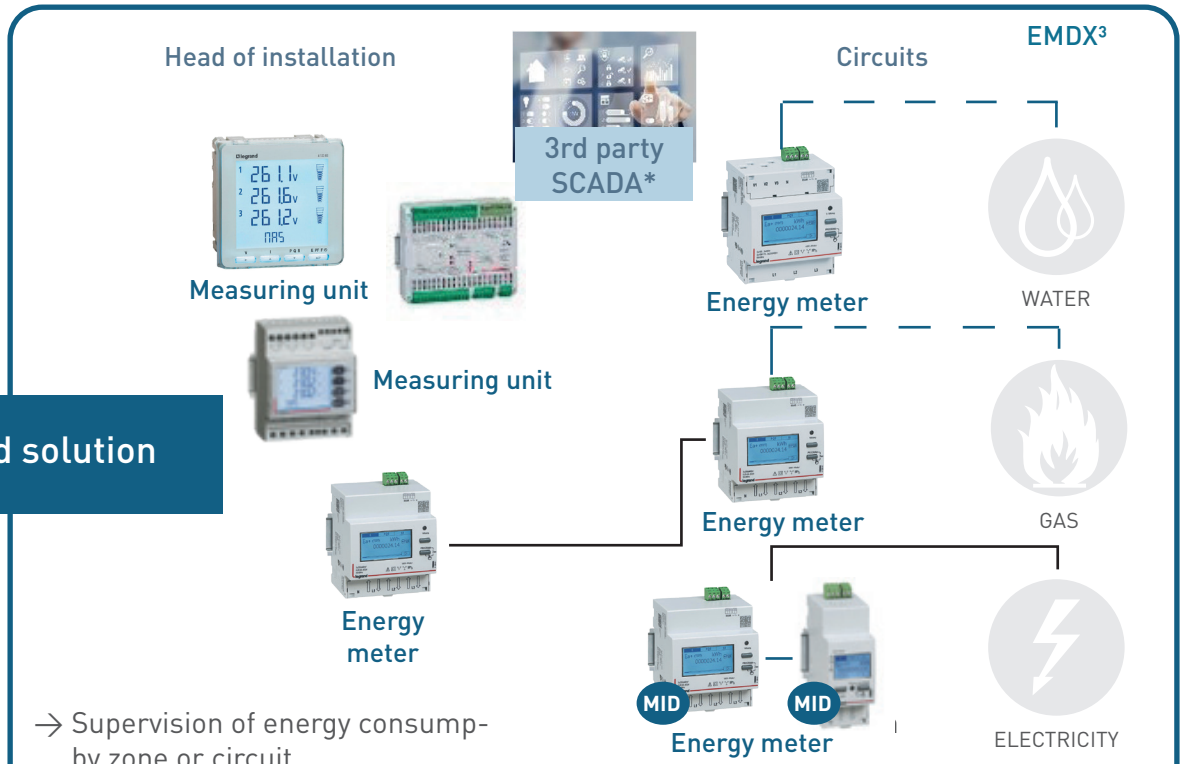
WHAT DO YOU WANT TO CARRY OUT WITHIN A **SHOPPING CENTER** OR **OFFICES**?

«I would like to supervise all consumption and control critical data (reactive and maximum power).

I also want to know the status of my high-priority circuits and be able to remotely control some of them.»

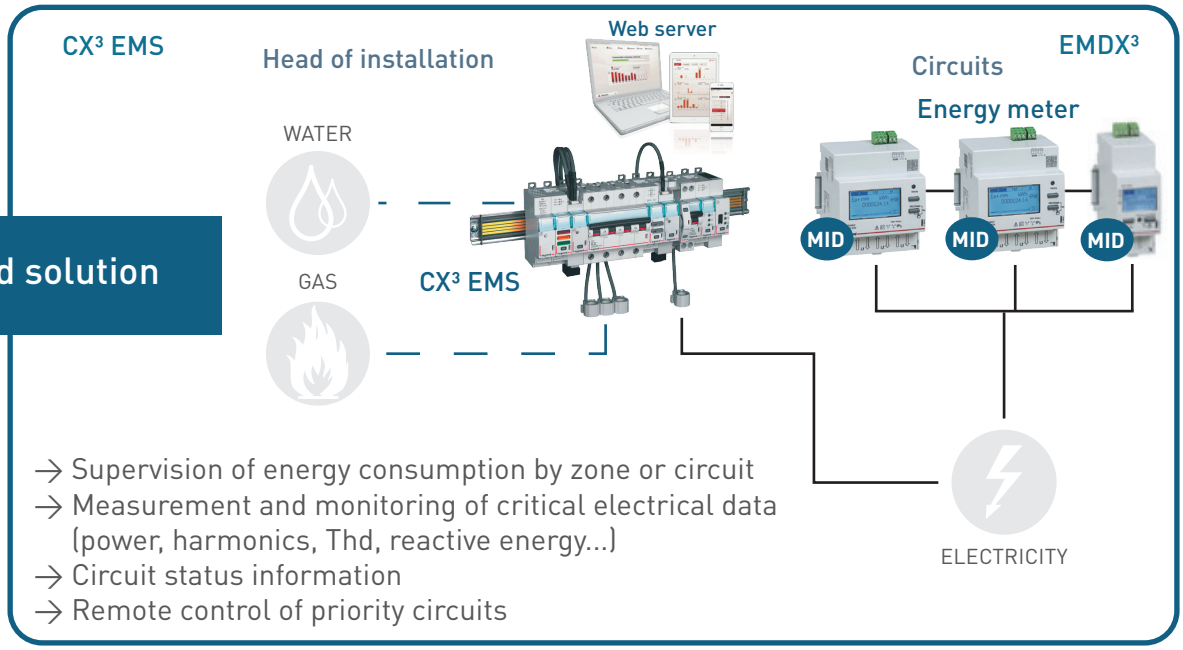
SINGLE/THREE-PHASE SOLUTION

Standard solution



→ Supervision of energy consump- by zone or circuit
→ Measurement and monitoring of critical electrical data (power, harmonics, Thd, reactive energy...)
→ Status and control of the circuits via Modbus and third party SCADA*

Advanced solution



→ Supervision of energy consumption by zone or circuit
→ Measurement and monitoring of critical electrical data (power, harmonics, Thd, reactive energy...)
→ Circuit status information
→ Remote control of priority circuits

Mesurement

Gathering

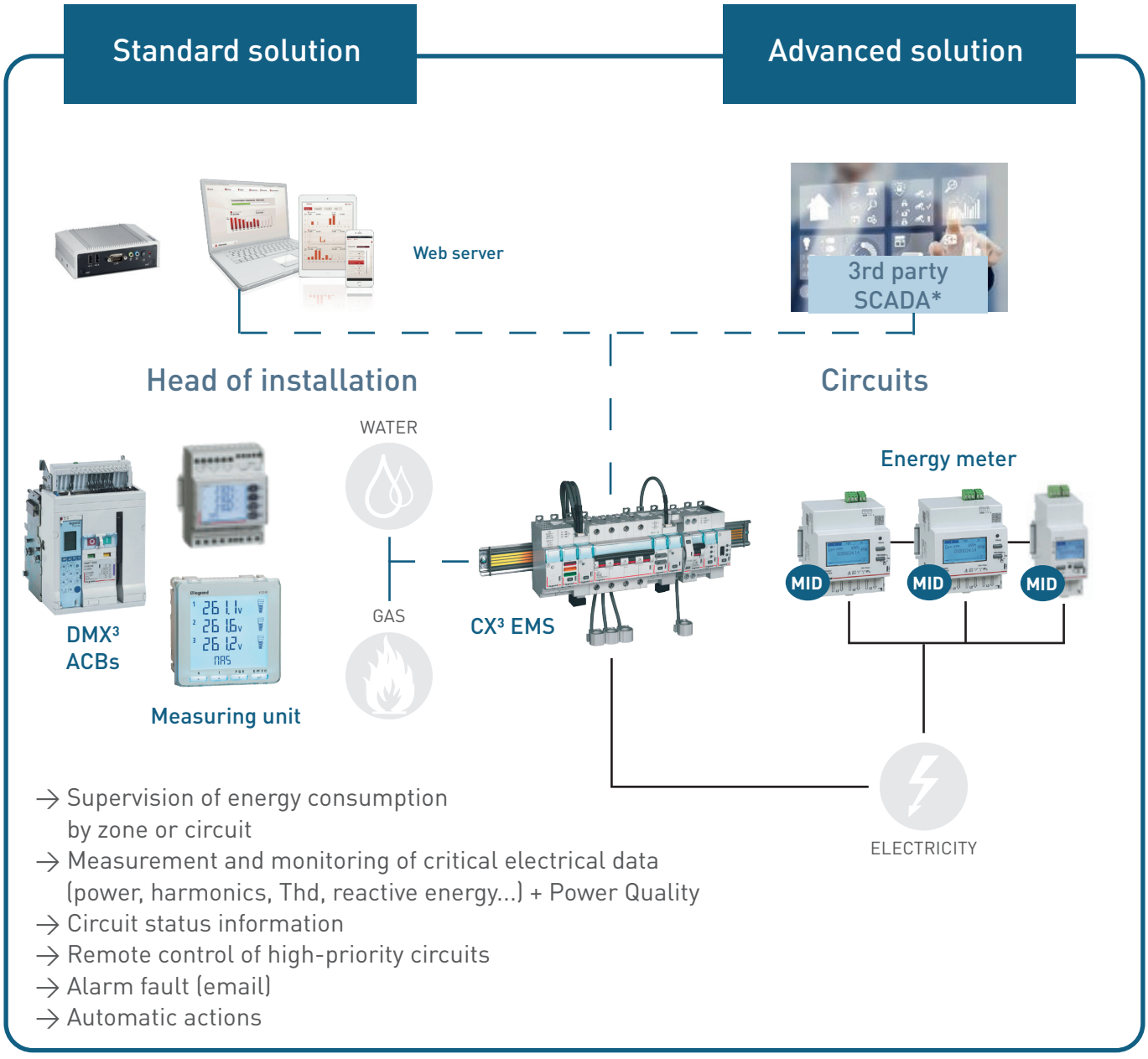
*Supervisory Control And Data Acquisition

WHAT WOULD YOU LIKE TO CARRY OUT WITHIN AN **AQUATIC CENTER** OR AN **INDUSTRY**?

« I want to supervise all consumption, control the quality of energy in my installation, know the status of my high-priority circuits and remotely control them, as well as being able to be alerted to any faults.

I also want to automatically reduce my consumption and avoid power overruns by being alerted.»

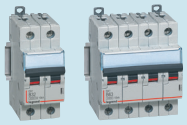
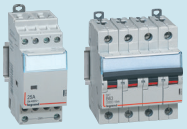
SINGLE/THREE-PHASE SOLUTION



*Supervisory Control And Data Acquisition

Mesurement
Control/Gathering

PRODUCT OVERVIEW

	PROTECTION	MESUREMENT	CONTROL AND SIGNALLING
RESIDENTIAL	 DX³ Ph+N MCBs	 Ecometer	
COLLECTIVE HOUSING AND SMALL OFFCIE BUILDINGS	 DX³ MCBs	 EMDX³ measuring units  EMDX³ energy meters  Earth leakage module with integrated measurement	 +  Auxiliaries and motorised control I/O interface
	 CX³ + DX³ MCBs	CX³ EMS modules:  Single-phase  Three-phase  Pulse concentrator	CX³ EMS signalling and control modules   CX³ EMS state reporting and control module
COMMERCIAL AND INDUSTRIAL	 DPX³ MCCBs  DMX³ ACBs	 EMDX³ measuring units  EMDX³ energy meters  CX³ EMS mesurement module  DMX³ with electronic proctection unit Electronic DPX³ with integrated measurement	 +  Auxiliaries and motorised controls I/O interface  Auxiliaries and motorised controls +  CX³ EMS signalling and control modules

COMMUNICATION

REMOTE

Live connection to the IP network (https web pages)

RS485 outputs integrated in EMDX³ devices and interface

Interface
for each earth leakage module

CX³ EMS/RS485 interface

RS485 outputs integrated in EMDX³ devices and interface

CX³ EMS/RS485 interface

RS485 interface for each DPX³

Communication option for DMX³

Modbus RS485 network

RS485/IP
interface

OR

Energy web server
Integrated
RS485/IP interface

IP Network

Touch screen

(https web pages)

Energy Management software (licence key) for local viewing and control on a workstation

Energy Web Server
for local or remote viewing and control on various media

Notes

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EXB20058 - December 2020