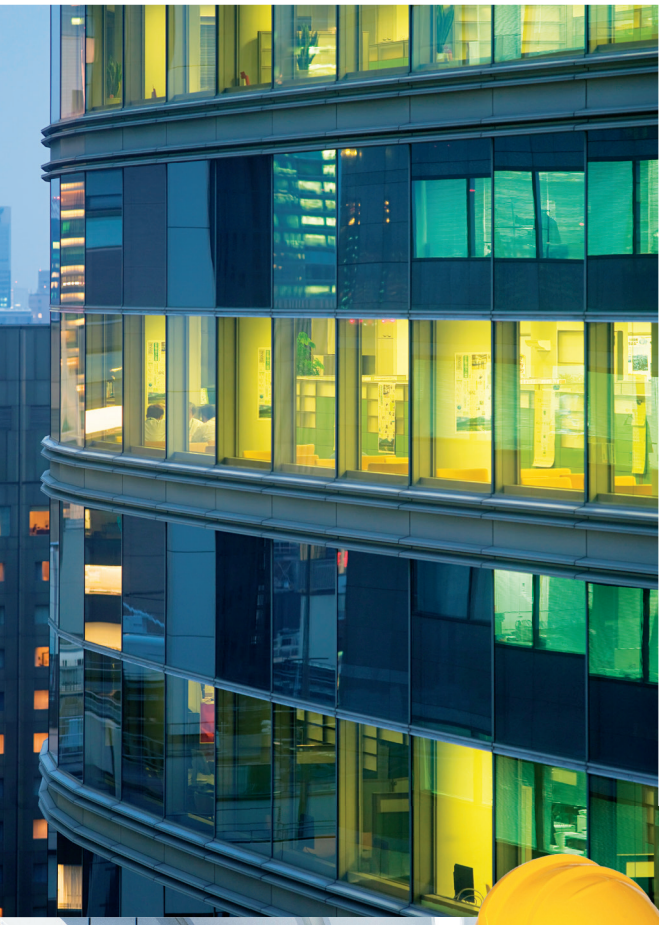
Energy Efficiency

SOLUTION & PRODUCTS FOR THE ENERGY MANAGEMENT

IME

A Group brand | legrand



ELEMENTS OF
Energy efficiency

Making energy efficiency means **reduce operating costs** in a system.

Today this is mandatory in several applications

The main questions

- How much are the consumptions?
- What are the consumption due to?
- How are consumption spread over time?
- How are the consumptions divided with respect to the costs?
- How can consumption affect production processes?
- How can consumption affect quality?
- Which loads could be critical with respect to consumption?
- How to intervene to optimize consumption?
- How can I improve the energy efficiency of my system?
- How can I centralize the energy data?
- Why control the quality of energy?

Costs reduction

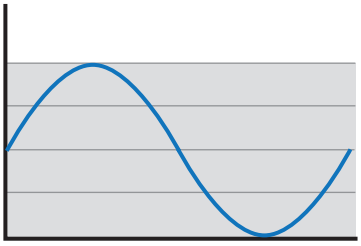
- Reduce the consumption
- Save the energy
- Maintain the productive levels

- Optimize the consumption of water, gas and electric energy
- Consume when the costs are less

- Avoid penalties

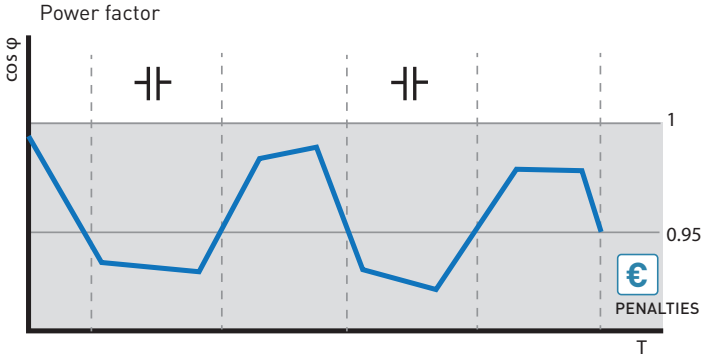
Service & production

Ensure the quality of energy and service continuity



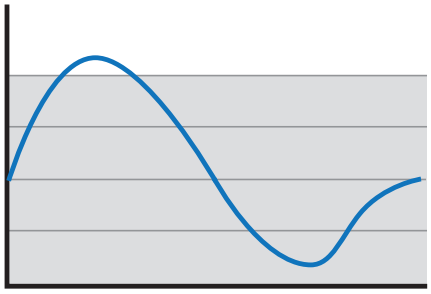
MONITORING & ANALYSIS

Penalties



The energy provider applies additional costs dr the user works with a power factor lower than the predefined values (costs for excessive reactive energy). Low values are determined by inductive loads and / or harmonic disturbances that require specific corrective actions, usually implemented by power factor correction regulators.

Network disturbances



Grid disturbances put productivity (energy quality according to EN 50160) at risk. Holes or voltage anomalies and harmonic components can damage sensitive equipment and cause production processes to stop. For this purpose it is necessary to understand in which circumstances the disturbances occur.

Power quality multifunction (in base to en 50160)

- Voltage drop
- Overvoltage
- Interruptions
- Interruption more than 180s
- Out-range voltage
- Out-range frequency

IME

STANDARDS AND RULES

The broad outlines

EED – Energy Efficiency Directive

European Directive aimed at reducing primary energy consumption in Europe for the period from 2021 to 2030.

The strategy indicated for achieving this objective consists of:
- Energy reduction of at least 32.5% by 2030
- Annual reduction target of at least 0.75% for each Member State
- Use of the energy audit tool to monitor the situation

Who

This directive applies to all companies with:
- a workforce of over 250 people
- annual sales in excess of €50 million
- or a budget exceeding €43 million Exception: ISO 50001 certified companies are exempt from this requirement.

The energy audit is a key tool for assessing the energy performance level of a building. It makes it possible to set the main energy consumption commitments and make an economic assessment where opportunities for improvement are identified. The validity and reliability of the analysis is therefore closely linked to the data on which it is based.

Field measuring devices and a data collection and analysis system represent the most effective solution, not just for a first audit, but for a continuous follow up that allows constant research and identification of efficiency improvement activities.

EPBD – Energy Performance of Building Directive (2018/884)

Compared with the 2010 edition, the 2018 revision of the Energy Performance of Buildings Directive (EPBD) sets new requirements that must be acknowledged by each Member State:

- Implement a long-term strategy for the renovation of existing buildings to improve their Energy Efficiency.
- New buildings, both private and public, must guarantee "Nearly Zero Energy" consumption, starting 31-12-2020*.
- Promote Smart technologies (automation systems, related products...) inside buildings as a fundamental tool to achieve solid energy performance levels, not just for a first audit, but for a continuous follow up that allows constant research and identification of efficiency improvement activities.

* by 31/12/2020 all building projects must be NZEB, meaning that such requirement will become mandatory from 31/12/20, while this year it is still not strictly necessary. However, this requirement could be re-formulated by the National Implementation Law...

ISO 50001 certification

Standard ISO 50001:2011 specifies the requirements on organisations to establish, implement, maintain and improve an Energy Management System (EnMS).

The dates

ISO 50001:2011 is an international voluntary standard drawn up by the ISO (International Organization for Standardization).

- since 2011

- 3-year certification cycle

Who

This certification can apply to organisations of all shapes and sizes, regardless of their geographical location and cultural or social context.
A company which complies with standard ISO 50001:2011 will therefore be able to demonstrate the existence of a robust EnMS.

The requirements

General requirements relating to this certification:

- a commitment to continuous improvement in terms of energy efficiency
- appointment of a qualified energy management specialist
- organisation 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

Measurement

Like directive 2012/27, 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-intensive 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.

SOLUTIONS FOR ANY BUILDING

The IME measurement and supervision range can satisfy many varied customer needs:

- regardless of the type of building: residential, commercial or industrial
- regardless of the type of need:
  - standalone offers, where it is mainly possible to view information: "I am informed"

STAND ALONE SOLUTION **"I am informed"**

Private housing

Structure(s): private homes, apartment blocks, small offices, etc
Function(s): metering, measurement
Option(s): setting parameters locally or remotely
View: locally.

Collective housing

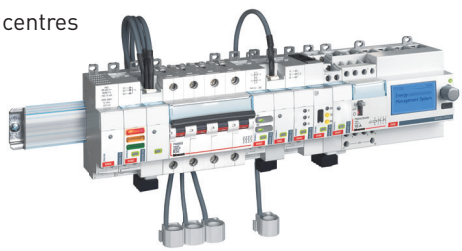
Structure(s): private homes, apartment blocks, small offices, etc
Function(s): metering, measurement
Option(s): setting parameters locally or remotely
View: locally.

Commercial/service sector

Structure(s): commercial buildings, small industrial concerns, large offices, etc
Function(s): metering, measuring numerous circuits and power quality
Option(s): setting parameters locally
View: locally

Industrial/service sector

Structure(s): office buildings, large industrial concerns, hospitals, data centres
Function(s): metering, measuring numerous circuits in several buildings and power quality
Option(s): setting parameters locally
View: locally.



Interconnected offers, where it is also possible to make changes to the installation by controlling it: **“I am informed and I take control”.**

INTERCONNECTED SOLUTION
“I am informed and I take control”

Collective housing

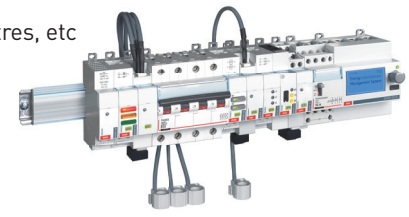
Structure(s): private homes, apartment blocks, small offices, etc
Function(s): measurement in each apartment or in communal areas
Option(s): setting parameters locally or remotely
View: locally or remotely

Commercial/service sector

Structure(s): commercial buildings, small industrial concerns, large offices, etc
Function(s): measurement, metering, monitoring, control, supervising all energy management
Option(s): setting parameters locally or remotely
View: locally or remotely

Industrial/service sector

Structure(s): office buildings, large industrial concerns, hospitals, data centres, etc
Function(s): measurement, metering, monitoring, control, supervising all energy management and that of the whole building (lighting, fire, access control, etc)
Option(s): setting parameters, configuring, controlling locally or remotely
View: locally or remotely



Data center

Structure(s): office buildings, large industrial concerns, hospitals, data centres, etc
Function(s): measurement, metering, monitoring, control, supervising all energy management and that of the whole building (lighting, fire, access control, etc)
Option(s): setting parameters, configuring, controlling locally or remotely
View: locally or remotely

ENERGY SUPERVISION

A complete and versatile solution for:

- direct system control
- checking the correct operation of the installation
- supervising the system using a PC, tablet and smartphone, through web server and dedicated software
- issuing CSV files for re-invoicing and consumption analysis purposes

Energy view (partial)

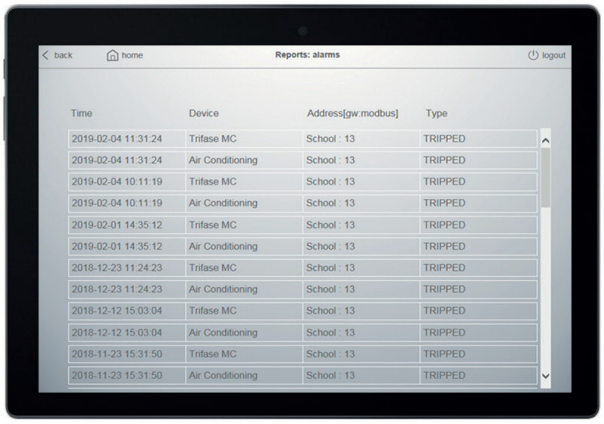
Advanced daily / monthly / annual display

Comparison of 2 zones per Day / Month / Year

THD view

Harmonic view

Alarm view



ENERGY MANAGEMENT

Measuring devices

The offer of IME measuring instruments can also make use of cutting-edge solutions. The different types of measuring instruments are characterized by:

- Maximum precision
- High reliability
- Simplicity of use
- Innovation
- Maximum performance

Kit retrofit

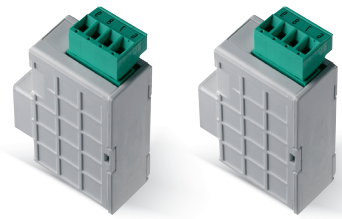
Solution that facilitates the installation of an energy monitoring system on existing plants.

NEMO 96 HD+

Connected with BT / MT networks via CT and VT flush mounted 96x96mm expandable with modules Plug-in.

NEMO 96 HDe

Entry level solution with built-in comunication protocol.



Moduli plug-in

The purpose of the plug-in modules is to integrate new functions into the Nemo 96 HD / HD + / HDLe models, such as analogue and communication outputs (MODBUS, MBUS, LONWORK, PROFIBUS), alarms and memory.

Traditional

MEASURING INSTRUMENTS

Multifunction meters

Equipped with LCD displays they are able to provide the measurement of: currents, voltages, active, reactive and apparent power, internal temperature and power factor.

The main features are:

- solutions for Din35 rail and panel 96x96mm;
- Modbus or MBus communicating devices;
- wide range of measured parameters;
- compliance with CEI 61557-12 e CEI 62053 -22/23;
- possibility of accessories with storage modules, temperature, communication;
- clear graphic interface and navigability simple.
- power quality analyzer EN 50160 Approved.

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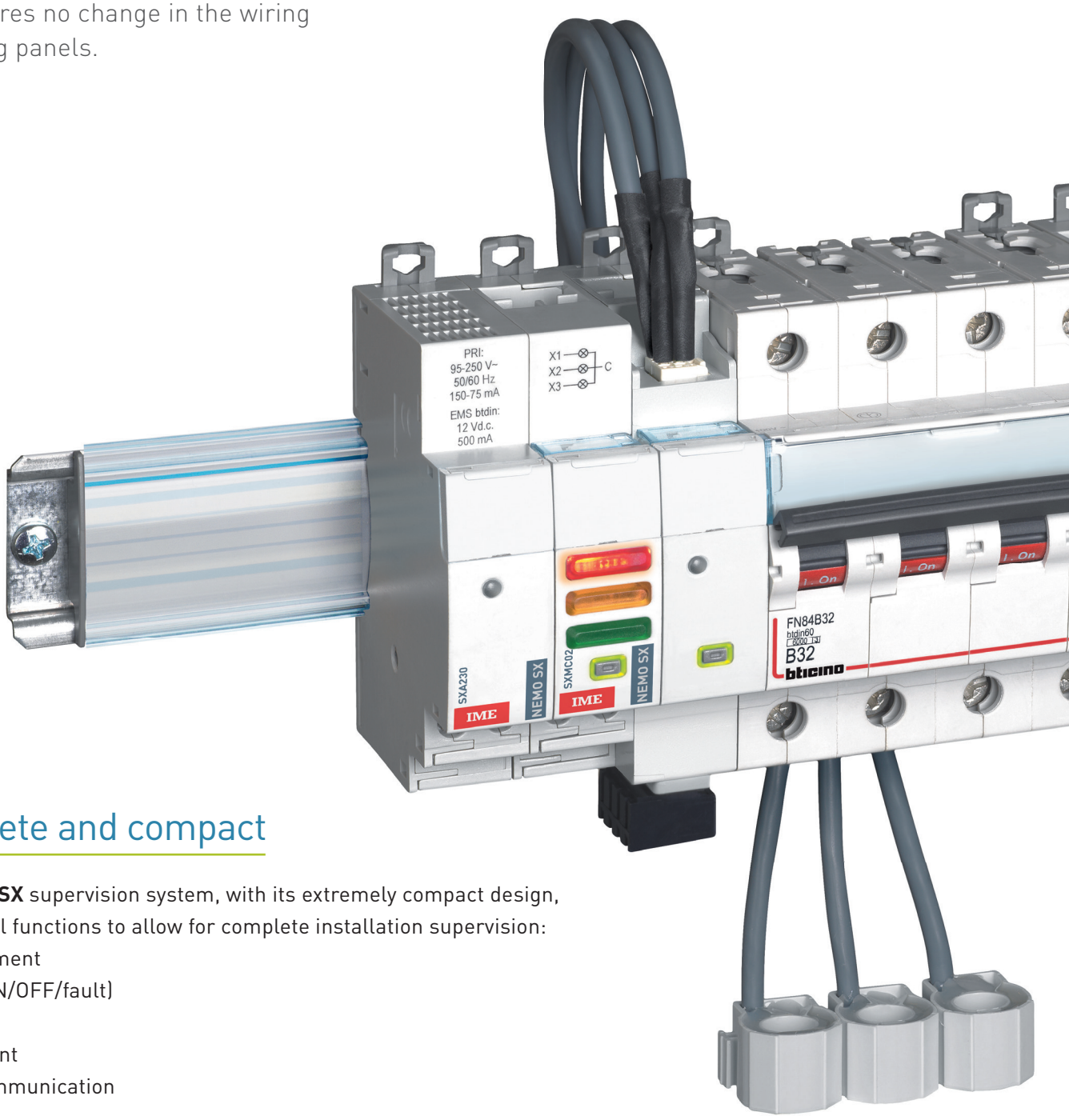
NEMO SX

Supervision system

NEMO SX is the new simplified supervision system

able to display, measure and control the installation from remote or local position.
An autonomous system able to be integrated, which, thanks to the innovative automatic connection system, simplifies the assembly stages
and requires no change in the wiring
of existing panels.



Complete and compact

The **NEMO SX** supervision system, with its extremely compact design, can offer all functions to allow for complete installation supervision:

- measurement
- status (ON/OFF/fault)
- control
- pulse count
- serial communication
- display
- precision class 0,5

Simple

Simple to choose

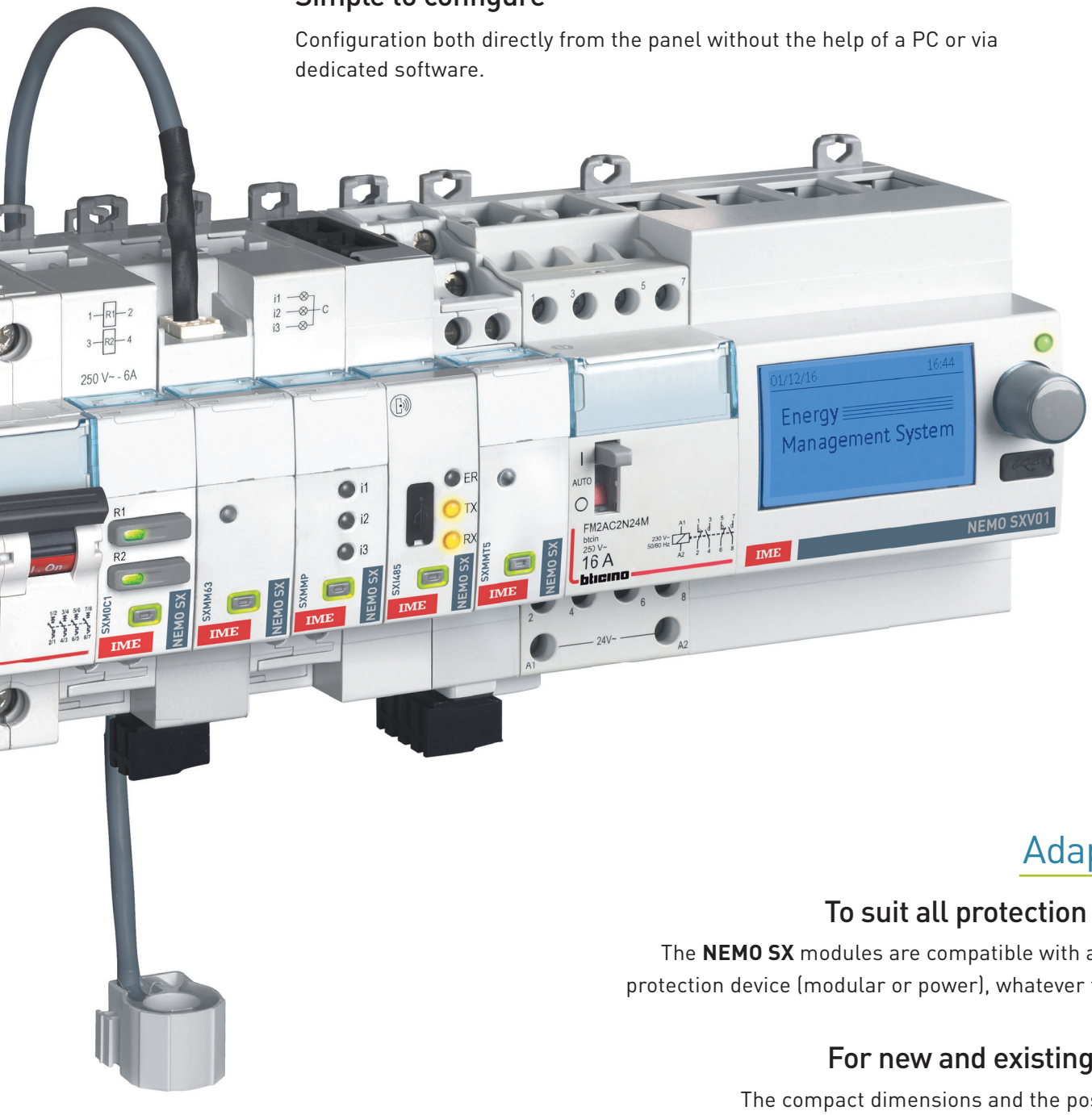
Only 8 modules with dedicated functions to supervise all installations.

Simple to install

Quick, pre-cabled connections on 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 or via dedicated software.



Adaptable

To suit all protection devices

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

For new and existing panels

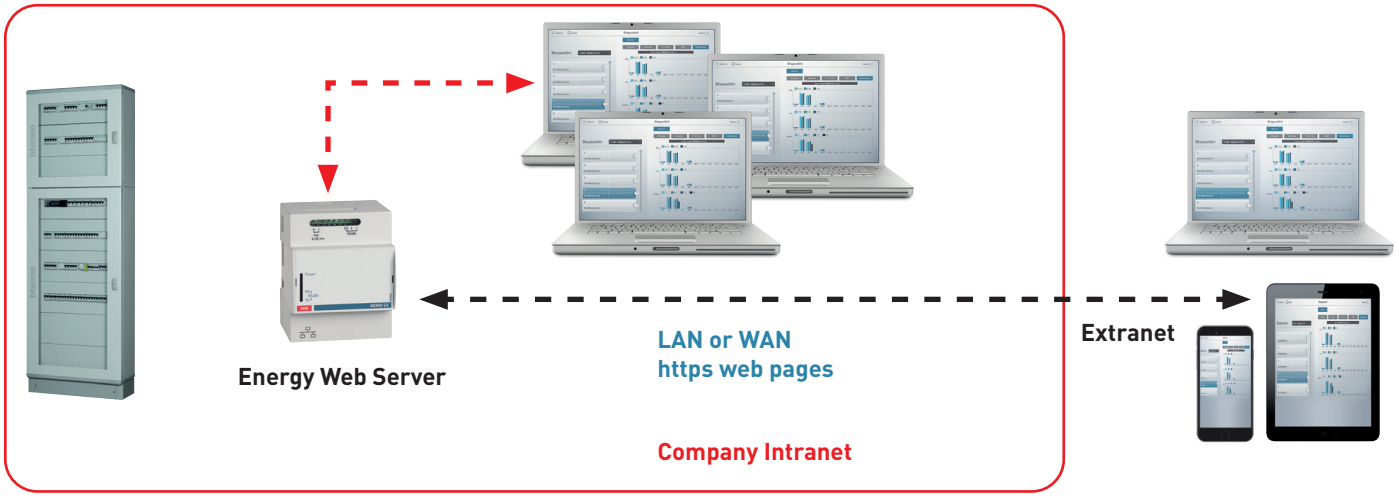
The compact dimensions and the possibility of connecting the system via 2 different solutions make it easy to install in new or existing switchboards.

WEBSERVER

Application examples

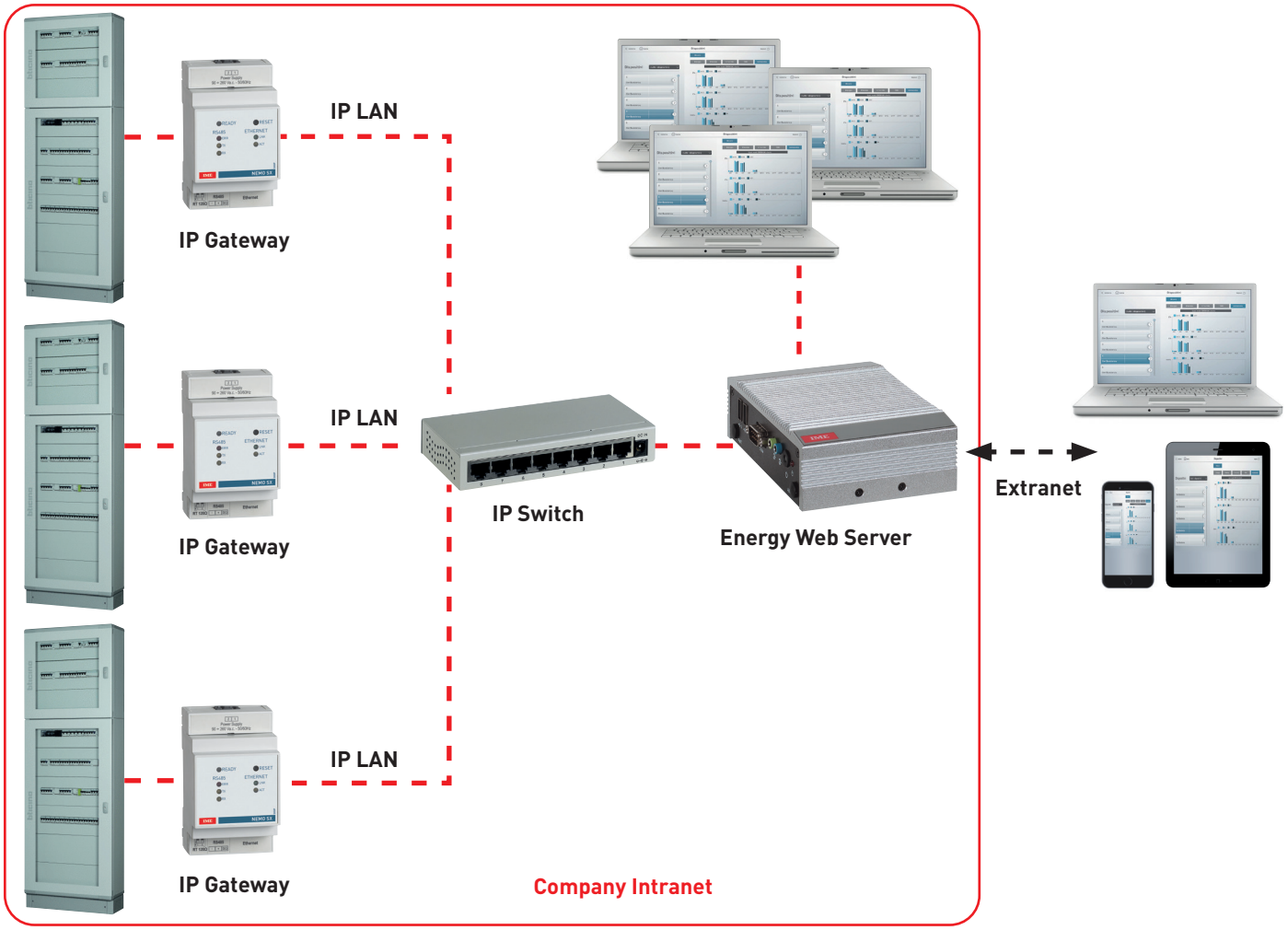
ARCHITECTURE: **EXAMPLE 1**

1 site

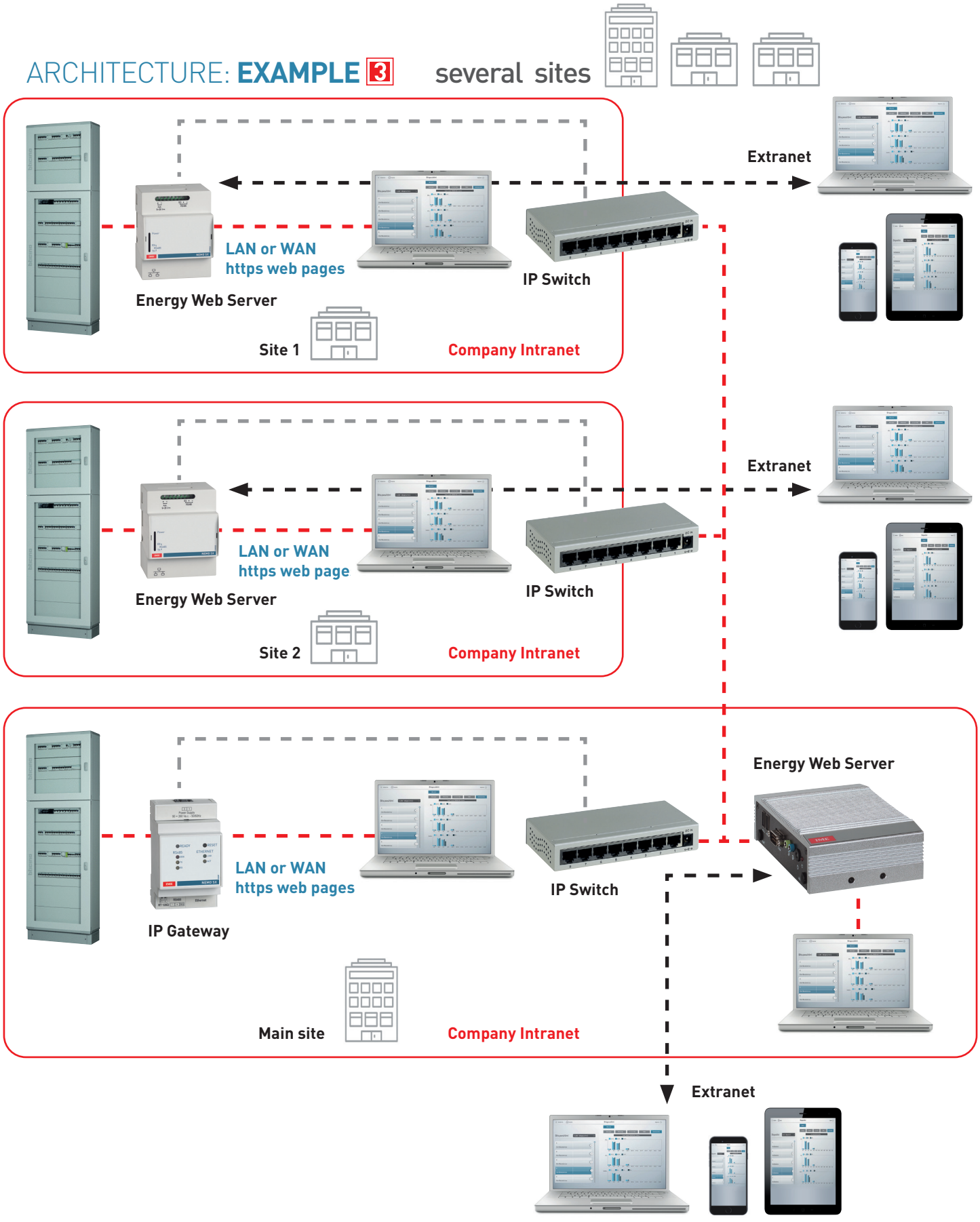


ARCHITECTURE: **EXAMPLE 2**

1 site



ARCHITECTURE: **EXAMPLE 3** several sites



APPLICATION EXAMPLES

Stand-alone solution



EXAMPLE 1

Ideal for individual installations where there is a local need to:

- monitor parameters (electricity, water, gas, calories, etc.) of consumption and/or production
- check the status of various devices (switches, contactors, relays, end runs, etc.)
- configure the installation simply
- monitor the network quality parameters according to the EN50160 standard

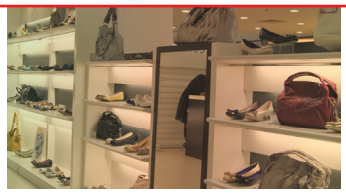
Use cases:

Residential buildings and small commercial businesses potentially with photovoltaic and/or thermal solar production pants, or shoold or city Hall where is necessary to be comply with regulations.

ENERGY METERS
MID and NO MID

POWER QUALITY
MULTIFUNCTION

Connected solution



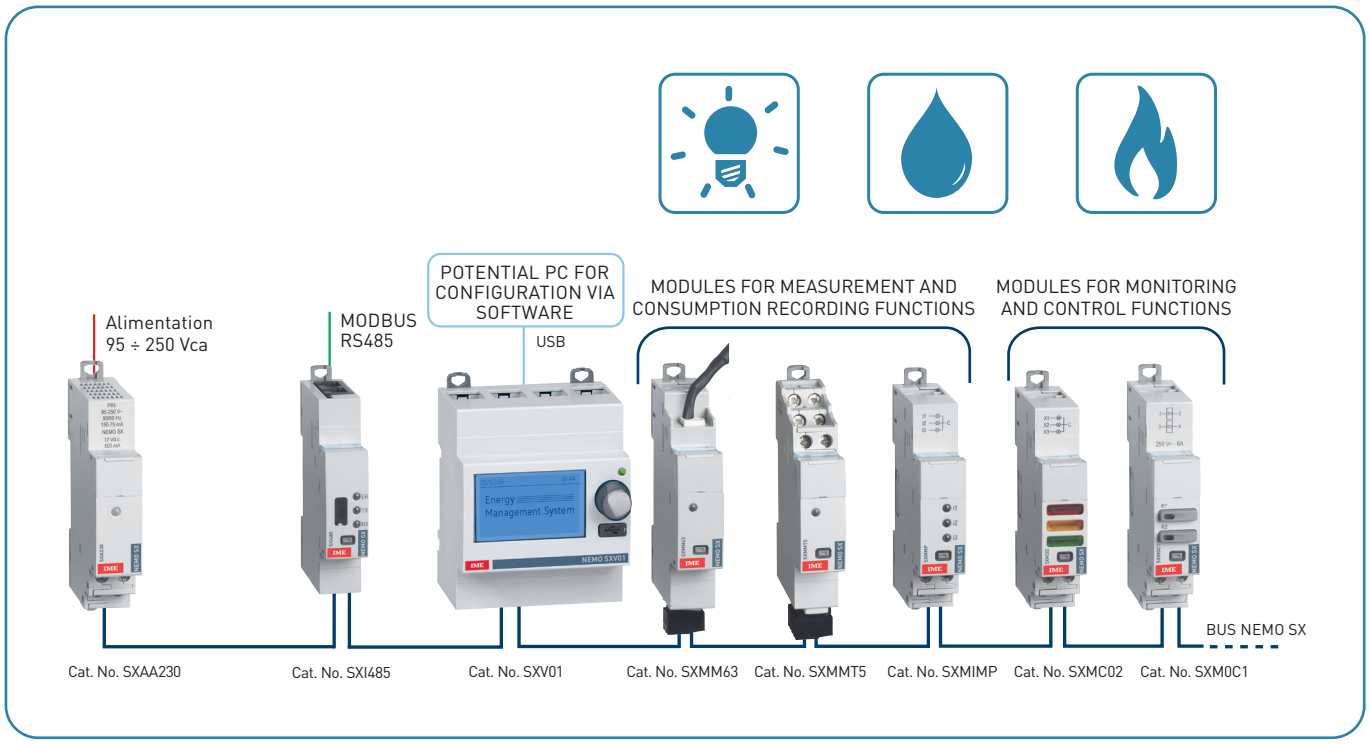
EXAMPLE 2

Ideal for multicircuits installations where local consumption needs must be displayed:

- monitor consumed and/or produced parameters (such as water, gas, calories, electricity)
- check the status of the devices
- disable and enable loads according to the desired load threshold
- local device control (switches, meters, etc.)

Use cases:

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



APPLICATION EXAMPLES

On-line solution



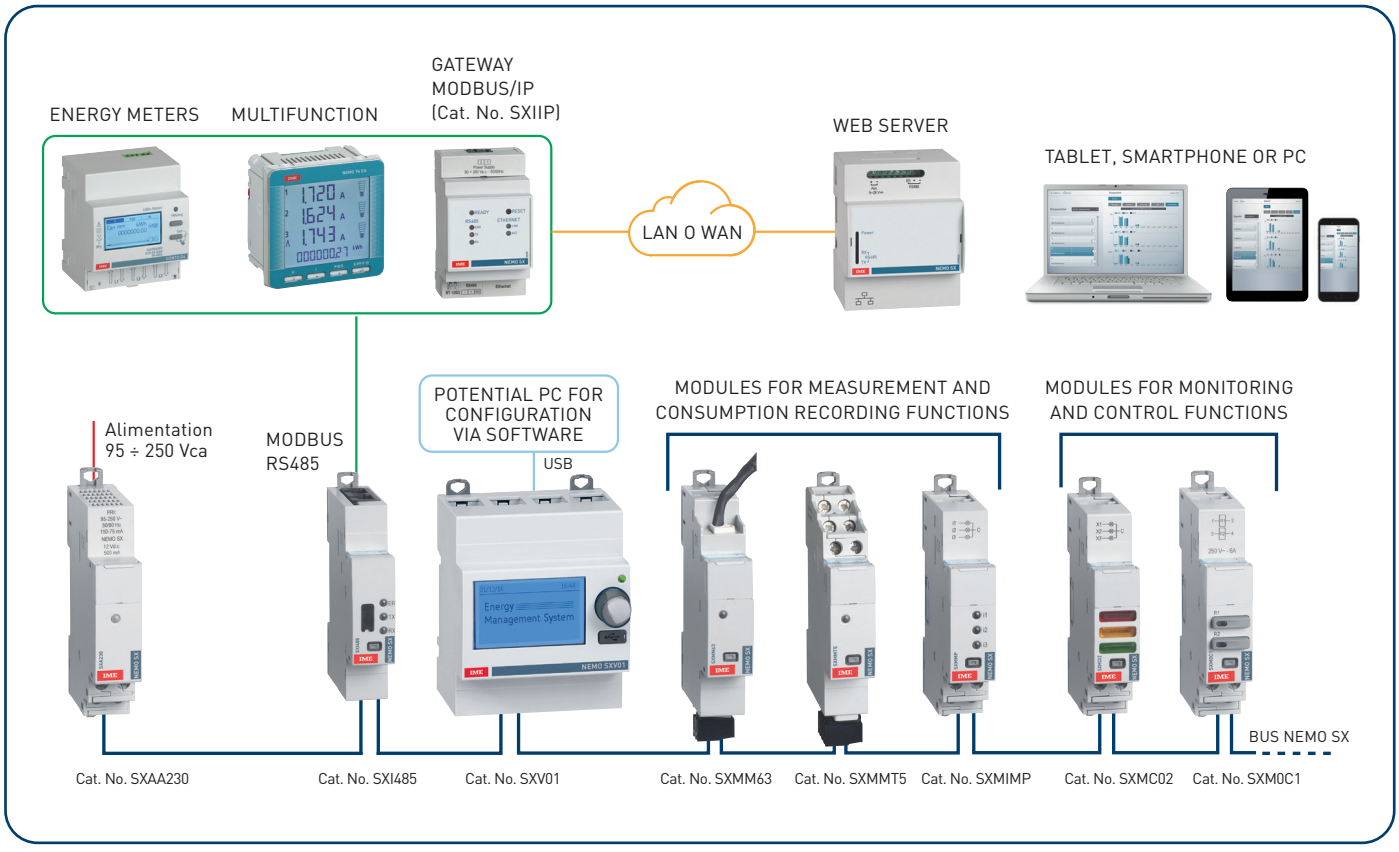
EXAMPLE 3

Ideal for installations where, in addition to the services described in the above examples, the following is also required:

- provide Histograms And Energy Reports
- record Events And Alarms
- save The Data In Csv Files And Automatically Send Emails
- implement Automation And Load Management Systems
- access The System Through Multiple Devices (Tablet, Pc, Smartphone)

Use cases:

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



Multi-site solution



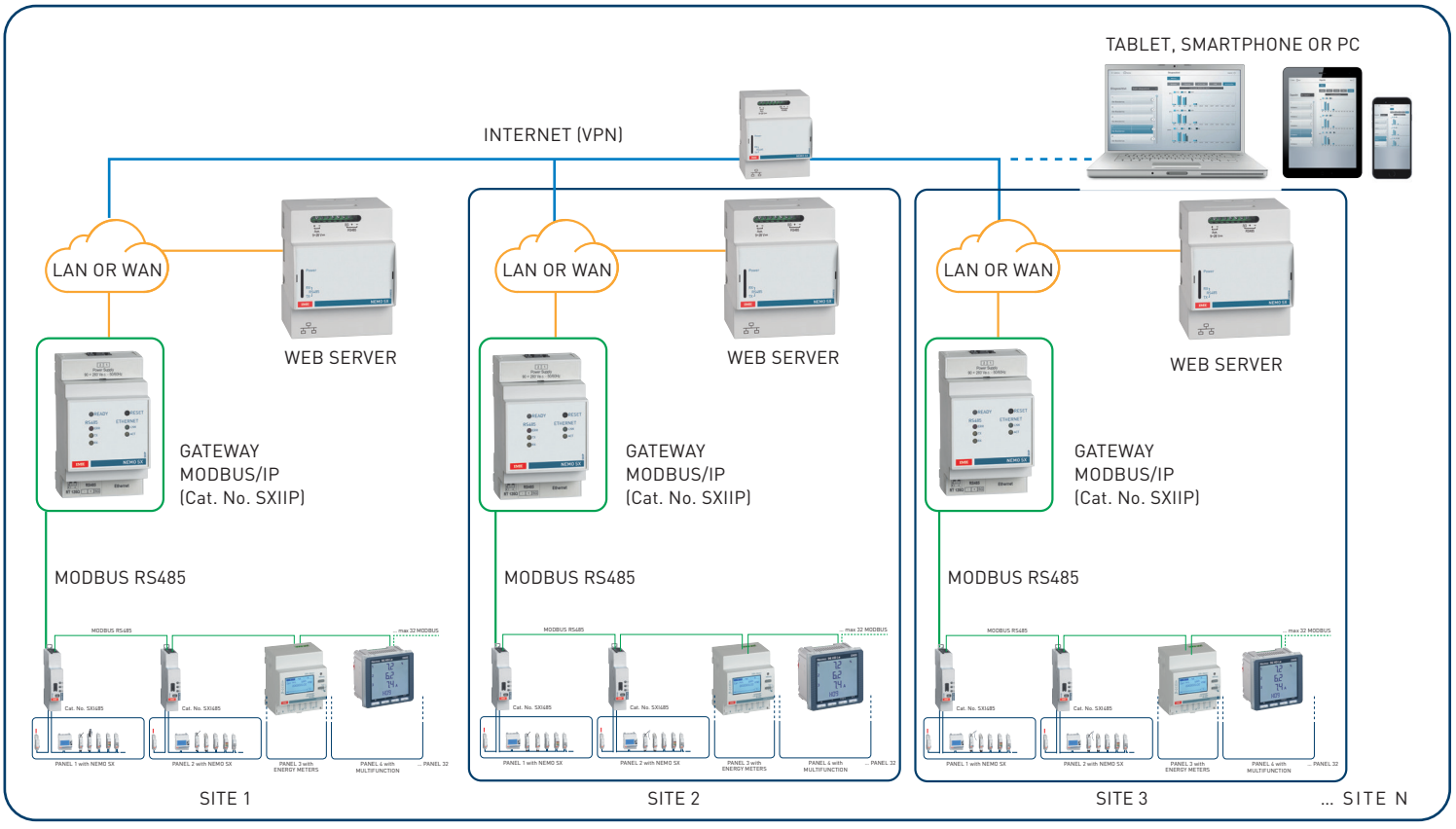
EXAMPLE 4

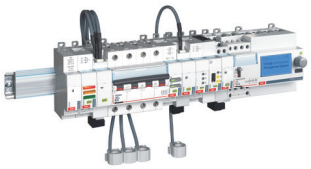
Ideal for individual plants where, in addition to the services described in example 3, the following is required:

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

Use cases:

Sites (bank branches, fuel sales outlets, chain stores or restaurants, schools, etc.) with simple services, which must be controlled by a single administrative entity.

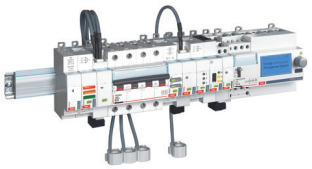


	LOW VOLTAGE GENERAL PANEL			
				
COUNTING AND MEASURE	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM	
ENERGY	INTEGRATED	INTEGRATED	INTEGRATED (>4 starting points)	
DOUBLE RATE	INTEGRATED	INTEGRATED	NO	
RE-INVOICING	INTEGRATED	NO	NO	
BASELINE ELECTRICAL VALUES	INTEGRATED	INTEGRATED	INTEGRATED	
ADVANCED ELECTRICAL VALUES (THD)	NO	INTEGRATED	INTEGRATED	
ENERGY QUALITY	NO	INTEGRATED	NO	

MONITOR	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM	
DEVICE STATUS	NO	OPTIONAL	INTEGRATED	
THRESHOLD MEASUREMENT	NO	OPTIONAL	INTEGRATED	
TEMPERATURE	NO	OPTIONAL	NO	

DRIVE	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM	
ELECTRONIC SWITCHES	NO	OPTIONAL	INTEGRATED	
LOAD CONTROL	NO	NO	INTEGRATED	
REMOTE	NO	NO	OPTIONAL	
AUTOMATIC ACTION	NO	NO	INTEGRATED	

COMMUNICATION PROTOCOLS	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM	
MODBUS RS485	INTEGRATED	INTEGRATED	INTEGRATED	
MBUS	INTEGRATED	OPTIONAL	NO	
LONWORK	NO	OPTIONAL	NO	
KNX	OPTIONAL	OPTIONAL	NO	
IP	OPTIONAL	OPTIONAL	OPTIONAL	
BACNET	NO	OPTIONAL	NO	

	SECONDARY DISTRIBUTION PANEL		
			
	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM
	INTEGRATED	INTEGRATED	INTEGRATED (>4 starting points)
	INTEGRATED	INTEGRATED	NO
	INTEGRATED	NO	NO
	INTEGRATED	INTEGRATED	INTEGRATED
	NO	INTEGRATED	INTEGRATED

	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM
	NO	OPTIONAL	INTEGRATED
	NO	OPTIONAL	INTEGRATED
	NO	OPTIONAL	NO

	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM
	NO	OPTIONAL	INTEGRATED
	NO	OPTIONAL	INTEGRATED
	NO	NO	OPTIONAL
	NO	NO	INTEGRATED

	METERS	MULTIFUNCTION TOOLS	MULTICIRCUITS SYSTEM
	INTEGRATED	INTEGRATED	INTEGRATED
	INTEGRATED	OPTIONAL	NO
	NO	OPTIONAL	NO
	OPTIONAL	NO	NO
	OPTIONAL	OPTIONAL	OPTIONAL
	NO	OPTIONAL	NO

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A Group brand | legrand

Viale Borri, 231
21100 Varese - Italy
www.imeitaly.com

In accordance with its policy of continuous improvement, the Company reserves the right to change specifications and designs without notice.

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