



## Get all the information you need to manage your electrical installation

Today, cost management and improved continuity of service can boost your competitiveness. For this, you need more information concerning the operation of your electrical installation: consumption data, load curves, disturbances, harmonic pollution, available power, etc.

**PowerLogic System brings you all this information. Information you can count on, where and when you need it.**

## PowerLogic System, the metering and monitoring solution

**PowerLogic System** offers a complete, consistent power metering and monitoring solution for optimal management of your electrical installation.

### A complete solution

- covering all electrical installation management needs, from simple current metering right through to remote monitoring of power quality
- backed by the most complete range of metering/monitoring devices and power-monitoring software on the market
- suited to the widest variety of applications in both industrial and service sectors.

### A consistent solution

- integrating all low and medium voltage metering, monitoring and protection devices
- offering communication software and gateways pre-configured for easy integration of Schneider Electric devices
- at the heart of the **Transparent Ready™** concept.



Public buildings



Hospitals

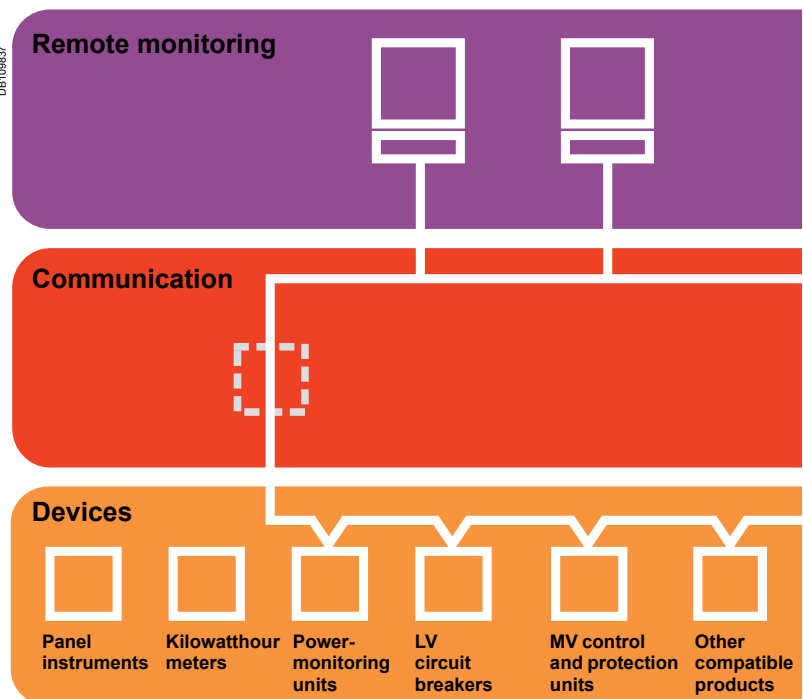


Semiconductor manufacturers



Automobile industry

*PowerLogic System, the metering and monitoring solution suited to the widest variety of applications.*



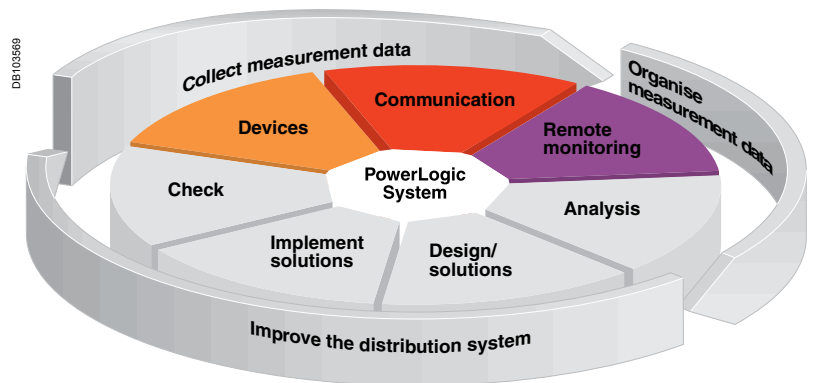
### A PowerLogic System solution integrates

- PowerLogic range products:
  - metering and monitoring devices, both communicating and non-communicating
  - communication interfaces
  - power-monitoring software
- Masterpact and Compact circuit breakers equipped with Micrologic control units
- Sepam and Vigirex protection relays
- any other Modbus-compatible device.

## PowerLogic System, the key to improving your electrical distribution system

PowerLogic System serves 3 functions:

- collection of measurement data
- organisation and transmission of measurement data to facilitate analysis by the different departments concerned: production, maintenance, accounting, site management
- checking of the results obtained after implementing electrical distribution system improvement solutions.



## With PowerLogic System, you control your electrical installation

PowerLogic System helps you

### Reduce energy costs

Get a clearer view of your consumption

- identification of major consumers and allocation of costs
- management of consumption peaks and optimisation of your utility contract.

### Improve continuity of service

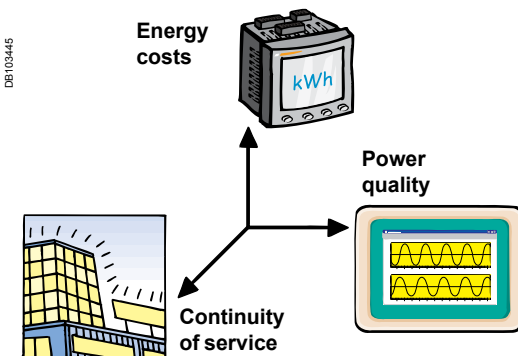
Use the full capacity of your installation

- analysis of the electrical distribution system
- diagnosis of failures.

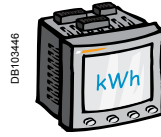
### Improve power quality

Increase power-system reliability and optimise your operating costs

- monitoring of harmonics
- lower maintenance costs
- reduced production losses.



## Reduce energy costs



**PowerLogic System** helps you reduce power consumption and the cost of the energy you use through sub-billing and electrical contract optimisation.

### Sub-billing and cost allocation to reduce consumption

Metering of energy consumption to:

- identify major consumers
- allocate costs
- make users aware of expenditures.

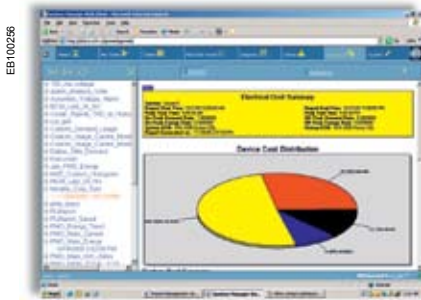
### Optimisation of power contract and load curves to reduce energy costs

Recording of energy consumption and load curves to:

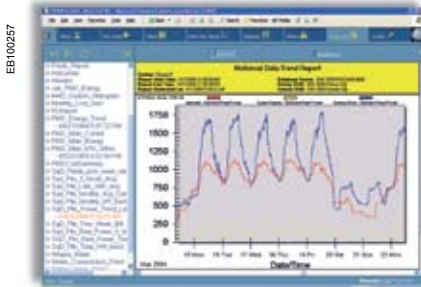
- optimise the power contract
- aggregate multi-site costs and negotiate global contracts
- identify spare capacity for electrical installation extensions
- manage peaks and avoid penalties:
  - improve power factor by power factor correction solutions
  - avoid subscribed-power overruns by automatic load-shedding.

### Monitoring of other utilities

Count pulses received from other utility meters (water, gas, steam, etc.) for global, centralised utility management.

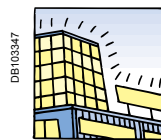


Cost reporting



Trend curves

## Improve continuity of service



Electricity is vital to site operation.

However, the phenomena that cause faults are not always easy to understand.

**PowerLogic System** gives a better understanding of the electrical distribution system and offers tools for analysis.

It lets you manage the system in real time and thereby increase reliability.

### Real time monitoring of your electrical installation

#### Panel instrumentation

For local display of measurement data and checks on installation operation.

#### Remote monitoring

Monitoring of the electrical installation to get the right information to the right person at the right time:

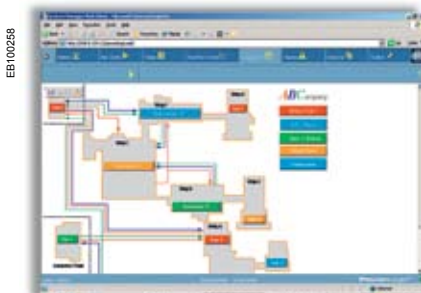
- switchgear status and measurements for the facility manager
- alarms and events for the maintenance department
- cost allocation for the accounting department, etc.

Open, flexible communication system allowing intervention by an external expert when required.

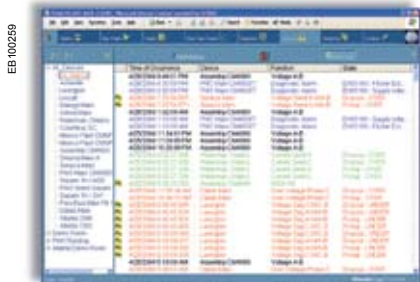
#### Transparent access to information via Web technologies

With the EGX400 Web server, you can now access all the information you need wherever you are and whenever you want via a standard browser like Internet Explorer®.

Web-enabled Power & Control  
**Transparent Ready**



Real time monitoring of your electrical installation



Event and alarm logs

## Preventive and corrective maintenance

### Preventive maintenance

Detection of problems in advance based on key parameters, to avoid equipment failures and downtime.

### Corrective maintenance

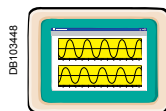
Clear, complete information for the facility manager regarding fault circumstances in order to get power restored as quickly as possible:

- local or remote alarms (e.g. by telephone or pager)
- fault locating, overall vision, summary tables, etc.

Detailed information for experts in charge of analysing the causes of faults and designing solutions to improve the electrical distribution system:

- event and alarm logs
- waveform capture, etc.

## Improve power quality



Power quality has a direct impact on operating costs:

- direct costs: over-consumption due to increased power losses
- indirect costs:
  - production losses: process malfunctions, unnecessary tripping
  - equipment costs: shorter service life, lower efficiency, oversized equipment.

**PowerLogic System** lets you assess the quality of your power, identify the causes of any problems and check the effectiveness of remedial measures.

Four main functions are used to check power quality:

- monitoring of harmonics
- detection of voltage sags and swells
- detection of transients
- EN 50160 electricity supply compliance checking.

### Measurement of total harmonic distortion and individual harmonic content

- identify sources of harmonic distortion and separate them from sensitive loads
- determine causes of malfunctions
- derate power devices (transformers, cables, etc.)
- implement filtering solutions.

### Detection and waveform capture of voltage sags and swells

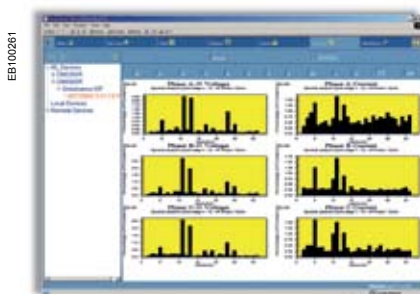
Determine the origin of production losses or shutdowns.

### Detection and waveform capture of transients

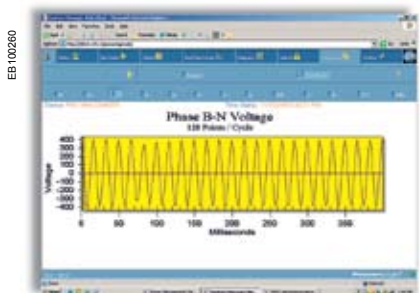
Determine the causes of malfunctions and breakdowns.

### EN 50160 electricity supply compliance checking

To assess the quality of distributed power according to the European standard EN 50160 and check that the distributor complies with the standard.



Spectral analysis of harmonics



Disturbance capture

# IM code

## Select your power-monitoring units the easy way

EB100254



PB101808a

### The IM code <sup>(1)</sup>, a recognised tool

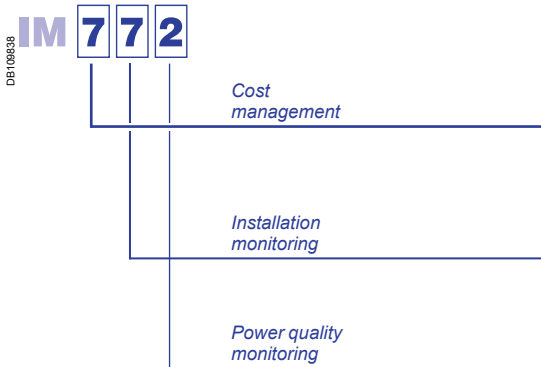
The IM code has been developed by **Gimélec** experts for electrical installation designers and end-users. It is widely used and recognised by the profession, just like the IP code for electrical enclosures or the IS code for electrical switchboards.

### An indispensable tool to define and specify the power-monitoring units of your electrical installation

#### The IM code has 3 functions

- It helps you define your measurement needs for the following applications:
  - Cost management
  - Installation monitoring
  - Power quality monitoring.
- It determines the most suitable power-monitoring unit.
- It generates specifications for your measurement solution, ensuring supply of the necessary functions and compliance with applicable standards.

Example:



#### A 3-digit code

The IM code is made up of 3 digits that define the functionality level of a measurement device for one of the 3 applications considered. Each digit varies from 0 to 7, where 7 corresponds to the highest functionality level.

##### The first digit corresponds to cost management needs.

- Optimisation of electrical consumption
- Reduction of electricity bills
- Cost allocation
- Sub-billing.

##### The second digit corresponds to electrical installation monitoring needs.

- Verification of correct operation of the installation
- Verification that the installation is correctly sized
- Monitoring of any drift with respect to nominal conditions.

##### The third digit corresponds to power quality monitoring needs.

- Verification of the quality of power supplied by the distribution utility
- Verification of the quality of power within the installation.

### PowerLogic, a comprehensive range of power-monitoring units

PowerLogic power-monitoring units meet all your energy management needs, from the simplest to the most demanding. They have been designed to provide the optimum solution for the most commonly encountered situations and IM codes.

PB100313 - DB1109839



The table on next page presents the IM codes of the power-monitoring units recommended according to:

- building type (tertiary, industrial, etc.)
- target application (cost management, installation monitoring, etc.)
- the position of the power-monitoring unit (main LV or subdistribution board, incomer or feeder).

<sup>(1)</sup> The IM code is a **Gimélec Promotion** registered trademark. The IM software was developed by the Gimélec experts..

# IM code

## Select your power-monitoring units the easy way (cont.)

### Preferred IM codes

Applicative profile	Segments		
	Commercial buildings	Industrial buildings	Large sites / Infrastructures
Cost management	Incomer or feeder: ■ basic level: 100 ■ medium level: 510 ■ advanced level: 772	Incomer or feeder: ■ basic level: 100 ■ medium level: 521 ■ advanced level: 772	Incomer or feeder: ■ basic level: 100 ■ medium level: 641 ■ advanced level: 772
Cost management Installation monitoring PQ monitoring (basic)	Main panel board: ■ incomer: 772 ■ feeder: 641 + time stamping or 772	Main panel board: ■ incomer: 772 ■ feeder: 641 + time stamping or 772	Main panel board: ■ incomer: 772 ■ feeder: 641 + time stamping or 772
	Secondary panel board: ■ incomer: 521 ■ feeder: 510 or 521	Secondary panel board: ■ incomer: 641 + time stamping ■ feeder: 521	Secondary panel board: ■ incomer: 641 + time stamping or 772 ■ feeder: 521 or 641 + time stamping
Cost management Installation monitoring PQ monitoring (advanced)			■ Connecting point: 774 or 777
	Main panel board: ■ incomer: 774 or 777 ■ feeder: 641 + time stamping or 772	Main panel board: ■ incomer: 772 or 774 ■ feeder: 641 + time stamping or 772	Main panel board: ■ incomer: 772 or 774 ■ feeder: 641 + time stamping or 772
	Secondary panel board: ■ incomer: 641 + time stamping ■ feeder: 510 or 521	Secondary panel board: ■ incomer: 641 + time stamping or 772 ■ feeder: 521	Secondary panel board: ■ incomer: 772 ■ feeder: 641 + time stamping or 772

- most frequent profile
- 2nd possible profile
- 3rd possible profile

## Current transformers



<b>CT</b>
current transformer

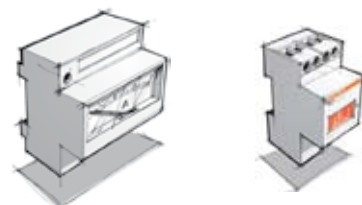
**Installation**

- insulated cable, diameter 21 to 35 mm, through transformer
- busbar through transformer
- cable connections

### Characteristics

- transformation ratio: 40/5 A to 6000/5 A
- accuracy: class 0.5 to 3
- maximum rated operational voltage: 720 V AC
- standard or tropicalised

## Panel instruments



Name	AMP / VLT	AMP / VLT	
<b>Function</b>	ammeter, voltmeter	ammeter, voltmeter	
<b>IM code</b>			

### Applications

#### Sub-billing and cost allocation

Energy consumption	
Consumption for different time periods	
Consumption of other utilities	
Optimisation of power contract and load curves	

#### Installation monitoring

Panel instrumentation	I / U	I / U	
Remote monitoring			
Advanced remote monitoring			

#### Power quality analysis

Monitoring of harmonics (THD)	
Analysis of individual harmonic content	
Detection of voltage sags and swells	
EN 50160 compliance checking	

### Characteristics

Measurement accuracy	class 1.5	± 0.5% ± 1 digit	
Installation	DIN rail 4 x 18 mm modules	DIN rail 2 x 18 mm modules	
Voltage measurement	VLT: 500 V AC direct or external VT	VLT: 600 V AC direct or external VT	
Current measurement	AMP: 30 A direct or external CT	AMP: 10 A direct or external CT	
Communication ports			
Inputs / Outputs			
Memory capacity			

## Kilowatt hour meters



AMP / VLT	IM100 / UM100	FRE	CH / CI
ammeter, voltmeter	ammeter, voltmeter	frequency meter	hour counter pulse counter

ME
watt-hour meter
100

I / U	I / U	F	hours / pulses

E

class 1.5	± 1% ± 1 digit	± 0.5% ± 1 digit	
flush mount 72 x 72 mm 96 x 96 mm	flush mount 72 x 72 mm	DIN rail 2 x 18 mm modules	CI, CH: DIN rail 2 x 18 mm modules CH: flush mount
VLT: 500 V AC direct or external VT	UM100: 600 V AC direct or external VT	400 V AC direct	
AMP: external CT	IM100: external CT		

class 2
DIN rail 2 or 4 x 18 mm modules
400 V AC direct
63 A direct or external CT

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### Power-monitoring units

Transparent Ready







Transparent Ready



Transparent Ready



<b>Name</b>	<b>PM9 / PM9P / PM9C</b>	<b>PM500</b>	<b>PM700 / PM700P / PM710</b>
<b>Function</b>	Power Meter	Power Meter	Power Meter
<b>IM code</b> 			

### Applications

#### Sub-billing and cost allocation

Energy consumption			
Consumption for different time periods			
Consumption of other utilities			
Optimisation of power contract and load curves			

#### Installation monitoring

Panel instrumentation	I, U, F, P, Q, S, PF, E (demand, minimum and maximum values)		
Remote monitoring			
Advanced remote monitoring			

#### Power quality analysis

Monitoring of harmonics (THD)			
Analysis of individual harmonic content			
Detection of voltage sags and swells			
EN 50160 compliance checking			

### Characteristics

Measurement accuracy	class 2 (active energy)	class 1 (active energy)	class 1 (active energy)
Installation	DIN rail 4 x 18 mm modules	flush mount 96 x 96 mm	flush mount 96 x 96 mm
Voltage measurement	450 V AC direct or external VT	480 V AC direct or external VT	480 V AC direct or external VT
Current measurement	external CT	external CT	external CT
Communication ports	1	1	1
Inputs / Outputs	1 O	8 I/O	2 O
Memory capacity			

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### Communication and supervision



Name	EGX100	EGX400	MPS100	SMS
Function	Ethernet gateway	Ethernet server	Ethernet server	power-monitoring software

### Applications

#### Ethernet communication

RS485 / Ethernet gateway				
Web server with standard HTML pages		Micrologic, PM9C, PM500, PM710, PM800, Sepam, CM3000, CM4000	Micrologic, PM9C, PM500, PM710, PM800	Micrologic, PM9C, PM500, PM710, PM800, Sepam, CM3000, CM4000
Web server with custom HTML pages				

#### Remote monitoring

Real time data				
Historical data				
Automatic notification				
Alarm and event logs				
Waveform display				
Custom animated graphics				
Automatic creation of custom reports				

### Characteristics

Ethernet ports Modbus TCP / IP protocol	10/100 Base TX port	10/100 Base TX port + 100 Base FX port (fiber optics)	10 Base TX port	
RS485 (2-wire / 4-wire) ports Modbus protocol	1	2	1	
Number of devices connected directly	32	64	10	
RS232 configuration ports	1	1	1	
Miscellaneous			<ul style="list-style-type: none"> <li>■ 1 modem port</li> <li>■ SMTP client</li> <li>■ 6 I / 2 O</li> </ul>	
Installation	DIN rail	DIN rail or desktop	DIN rail or desktop	

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**Software, a tool serving site operation.**  
*A site can be compared to a living organism. The power system manager has no control over the changes that affect this organism, but must ensure that it continues to receive the energy it requires. Similar to a doctor, the power system manager must carry out preventive measures and diagnose and remedy any problems that occur. The goal is to maintain the site in a healthy state, without generating any secondary effects. Software enables managers to diagnose the causes of most problems encountered on electrical systems.*

More and more devices are capable of communicating. The number of available measurements is also on the rise, creating the need for a tool to successfully manage all the information..

The main purpose of software is to simplify complex sites so that they can be managed by humans:

- make the site and its operation intelligible
- make the power system tangible and visible.

## The role of software

### All measurements at a single location

All measured values may be accessed via a PC.

### Organisation and use of measurements

Before they may be used, certain measurements must be organised, processed or integrated in special tools.

### Device setup, example of a Circuit Monitor

Simple devices may be set up on their front panels.

For devices with advanced functions, local setup is often difficult and even impossible for some functions.

Software greatly facilitates device setup.

### Automatic tasks

Software can execute tasks automatically, triggered by:

- a date
- an event
- an alarm.

These tasks may concern devices (reset, start of a particular function) or system users (transmission of an e-mail, etc.).

### Manual commands

Power-monitoring software can also be used to control devices (e.g. open or close a circuit breaker).

Certain control/monitoring functions (automatic action on electrical-distribution system) are carried out by PLCs integrated in the PowerLogic System architecture.

## Access via the Web

Information must be adapted to user needs and then made available to them.

Software can handle the adaptation by preparing custom reports.

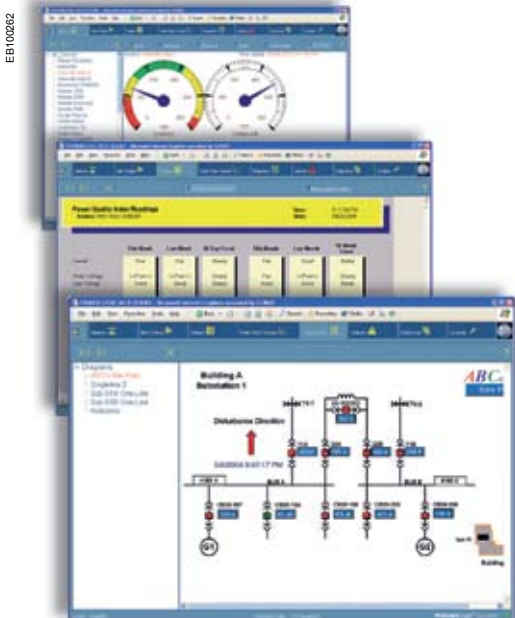
These reports can then be accessed by any PC on the site using a standard Web browser.

## Software and architecture

Software must be capable of meeting a large number of needs:

- single-user or multi-user operation
- data organisation according to user profiles
- adaptation to different site topologies
- data exchange with other systems
- etc.

This set of constraints means that a single product is not sufficient; a range of software products is required..

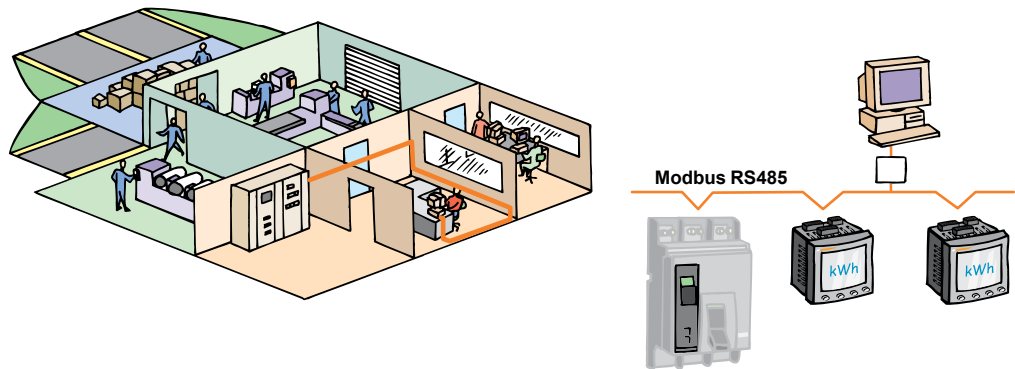


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**PowerLogic System** can be used in a number of different architectures depending on the layout of the site. It also offers different user profiles simultaneously.

## Example 1

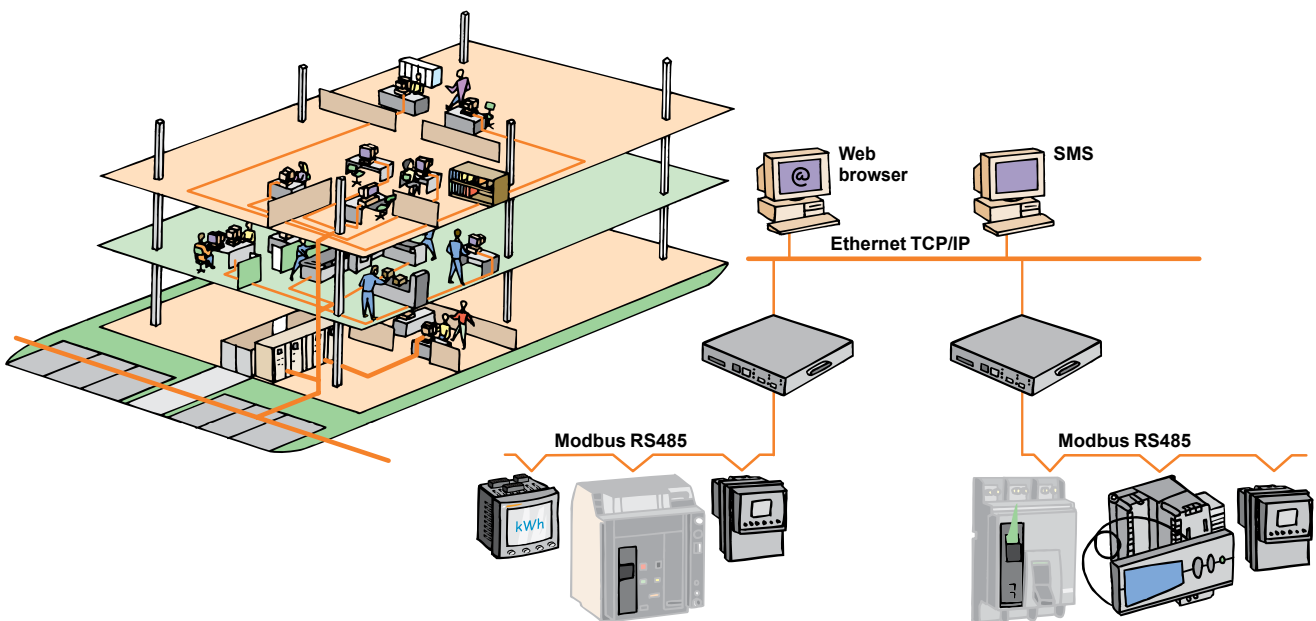
- installation in a small building or isolated equipment room
- one or more metering/monitoring units connected to a simple PC (directly or via modem)
- for electrical installation monitoring by the maintenance department.



DB 108849

## Example 2

- installation in a building with a number of users interconnected by a local Intranet
- connection of metering/monitoring units to EGX gateways for integration in the company Ethernet network
- for shared management of the electrical installation by different departments:
  - simple monitoring, with no dedicated software, using a Web browser,
  - complete power-monitoring using SMS software.



DB 108850

**Example 3**

- installation in a number of buildings linked by a company Intranet
- connection of metering/monitoring units to EGX Web servers for integration in the company Ethernet network
- all sectors of the company connected to the Intranet have direct access to essential data on the electrical installation via their Web browser.

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