Technical article

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CVM-NET4+
Complies with the Energy Efficiency standards

New multi-channel consumption and power analyzer

Current situation

The current market standards establish the guidelines for the implementation of new systems that can manage consumption data, with the purpose of knowing how and when our installations are consuming energy.

The new European Directive 27/2012 EU will come into force during 2015, establishing a national objective for improving the efficiency of large companies. This obliges installation managers to have verifiable and quantifiable data about the different energy uses of their installations.

This information will be vital for achieving a better understanding of how each installation behaves and for controlling such behaviour, since one of the key objectives is to achieve a 20% reduction in the energy consumption of these installations.

These companies are obliged to perform external audits to corroborate the compliance of their systems with the new standards. Therefore, these companies have the option to install their own Energy Management System (EMS) as an alternative to performing an external audit.

In addition, some standards, such as ISO 50001, also applicable to SMEs, already recommend these types of systems with the purpose of measuring and quantifying the consumption of energy per zone and type of use, which are useful for the continuous improvement of different energy processes and systems.

When addressing how the system must be installed, the features of electrical installations are not always constant, i.e., many different single-phase channels often exist in switchboards. To this end, units that can measure different types of lines in a reduced space must be installed, avoiding the installation of new measurement sub-panels.

This is quite a critical point, since significant investment will be required to adapt the measurement system if the consumption analyzers cannot be installed in existing panels.
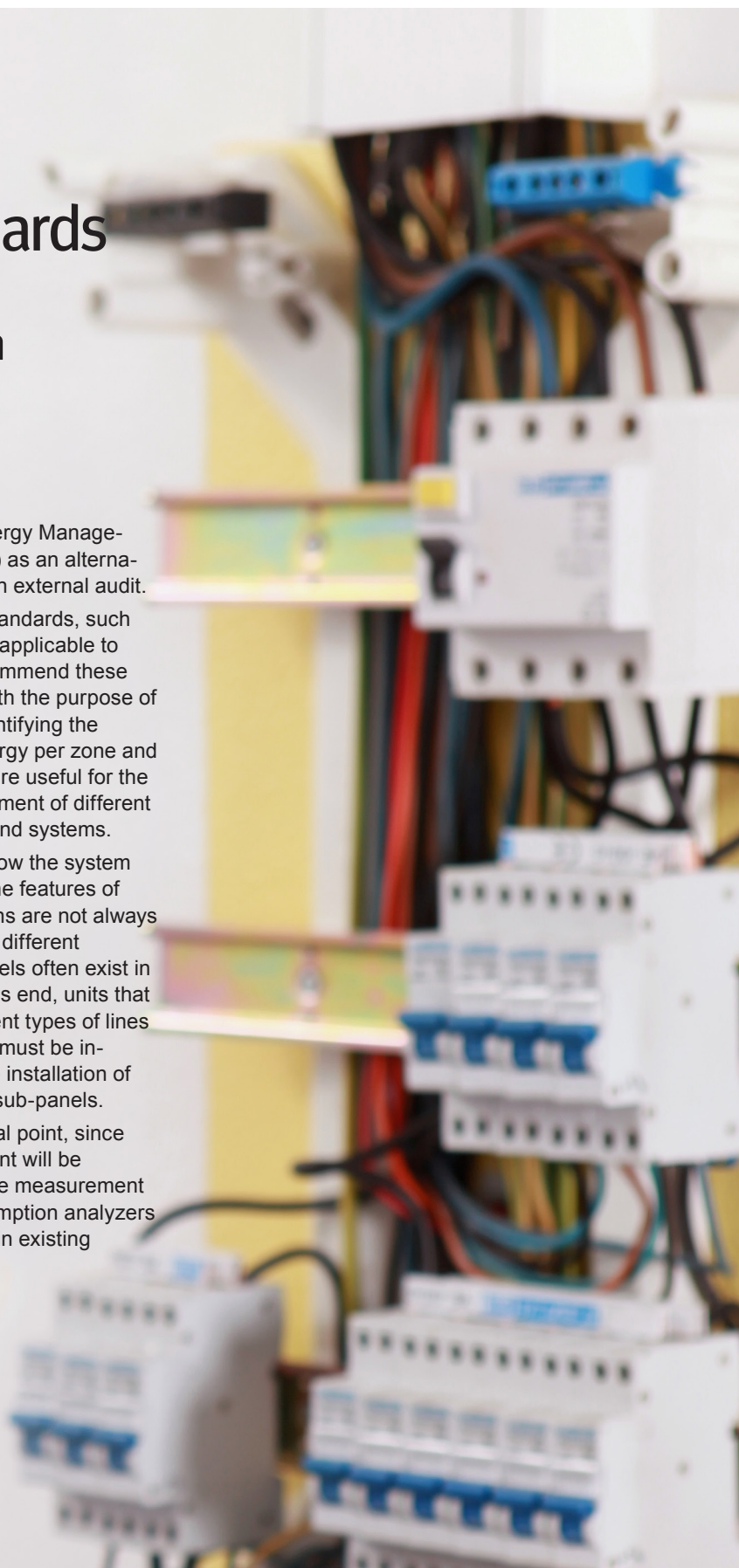
Solution

The new **CVM-NET4+** multi-channel power analyzer has been specially designed for multi-channel applications in existing panels, providing information on over 750 electrical variables for the complete management of installations. Read about its advantages:

✅ **Less space**

✅ **Saves time**

✅ **Reduces costs**

» 4 to 12 analyzers in a single unit

» Simultaneous measurement of single and three-phase lines

» Data centralised in a single measuring point

» Use of MC1 and/or MC3 efficient transformers.
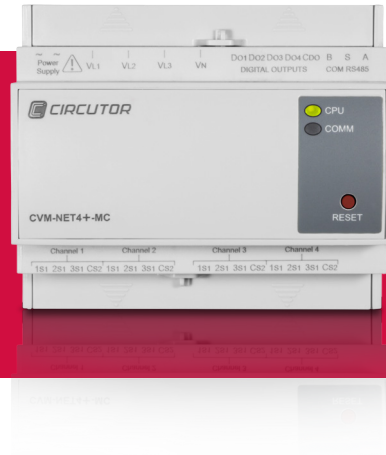
CVM-NET 4+

CVM-NET4+-MC-RS485-C4 is a multi-channel power analyzer with compact dimensions that can measure up to 750 electrical variables with a centralised approach. Its versatile configuration options enable you to take measurements from single-phase systems, three-phase systems or a combination of both.

The unit features a single three-phase voltage input, saving time during its installation, in addition to combining up to 12 configurable current measurement channels, through the **MC** efficient current transformers.

The data gathered by the analyzer is transmitted via the RS-485 communications bus with the Modbus/RTU protocol to the supervision SCADA (**PowerStudio / PowerStudio Scada / PowerStudio Scada Deluxe**).
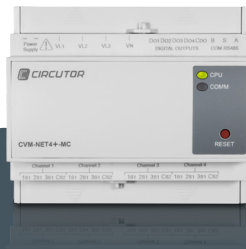

» Over 750 electrical parameters.

» DIN Rail format.

» Size of only 6 modules.

» Reads 12 single-phase channels or a combination of these channels with three-phase current channels.

» Current measurement with efficient transformers of the MC series (.../250 mA).

» RS-485 Communications (Modbus RTU).

» 4 programmable digital outputs.

» Sealable.

» Compatible with PowerStudio / PowerStudio Scada / PowerStudio Scada Deluxe software.
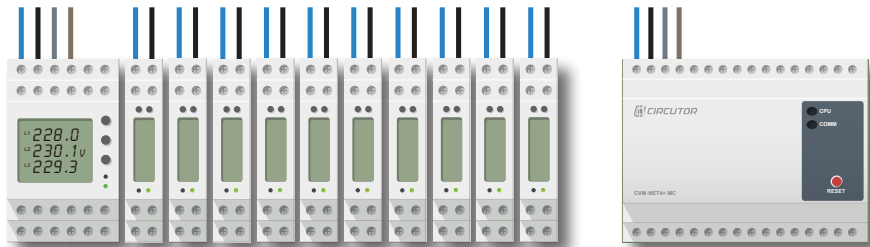
❶ Installation

Saves space

Space restrictions often arise due to the large amount of units and wiring. Therefore, **CVM-NET4+** features a connection mounted on a DIN rail, with a 6-module housing, which can be adapted to any type of electric panel.

12 modules

6 modules
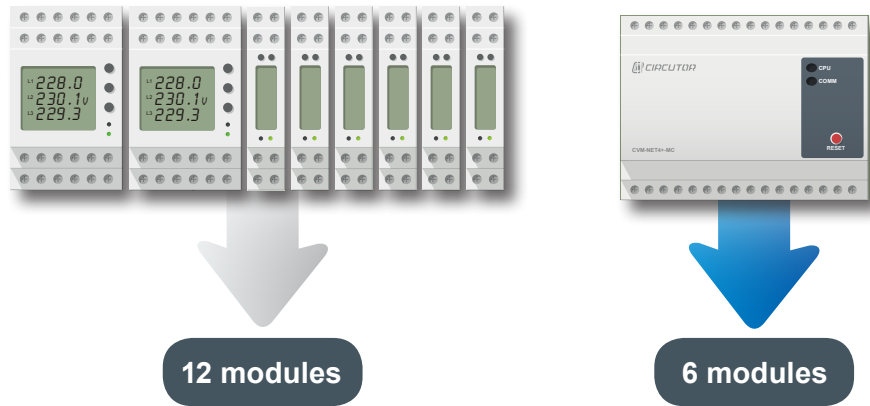
Saves time

Thanks to its design, **CVM-NET4+** features a single voltage measurement connection, avoiding the connection of 12 lines at the same time, i.e., it is the ideal measurement solution for switchboards.

The use of efficient transformers of the **MC1/MC3** series helps quickly connect the current channels, in addition to achieving a lower consumption than conventional transformers.

Reduces costs

Save money by installing a single unit instead of up to 12 single-phase analyzers, 4 three-phase analyzers or a combination of both types of analyzer. **CVM-NET4+** offers the same performance features in a single unit.

In addition, you will be able to send information via Modbus RTU to the PowerStudio Scada electric energy management and monitoring software with a single communication cable (RS-485).
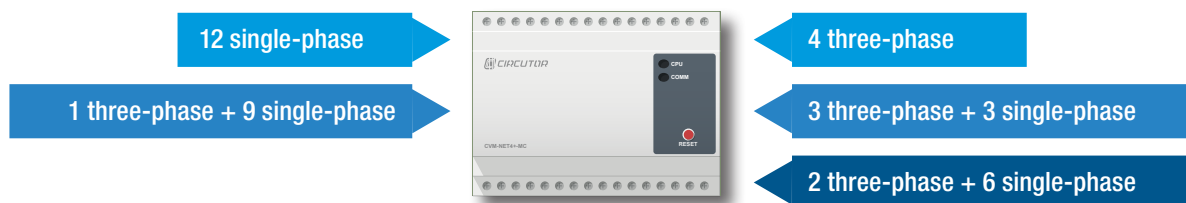
RS-485

RS-485
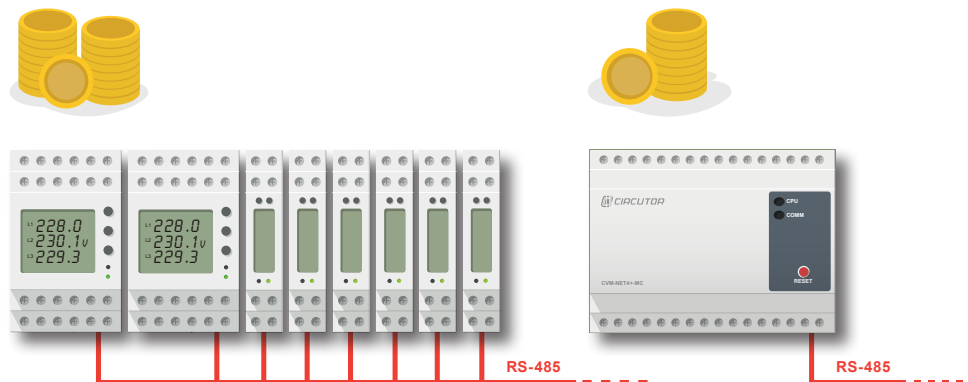
❷ Configuration

With a size of only 6 modules, the unit can combine 12 measurement channels (single or three-phase), offering a highly versatile unit. Therefore, the consumption of different lines can be measured, grouping this data through the **Power-Studio, PowerStudio Scada or PowerStudio Scada Deluxe** platforms.

With such a configuration, detailed consumption reports can be prepared by zone and type of use, creating a system that is adapted to the new requirements and standards, such as the EN 16247 Standard or the new European Directive 2012/27/EU.

In addition, the unit features 4 relay outputs, so the **CVM-NET4+** can control loads or alarms to improve the management of the installation.
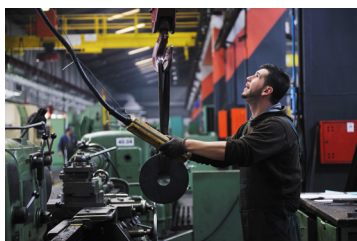
The versatility of the unit offers multiple configurations in a single unit:

MULTIPLE CONFIGURATIONS

12 single-phase
1 three-phase + 9 single-phase

4 three-phase
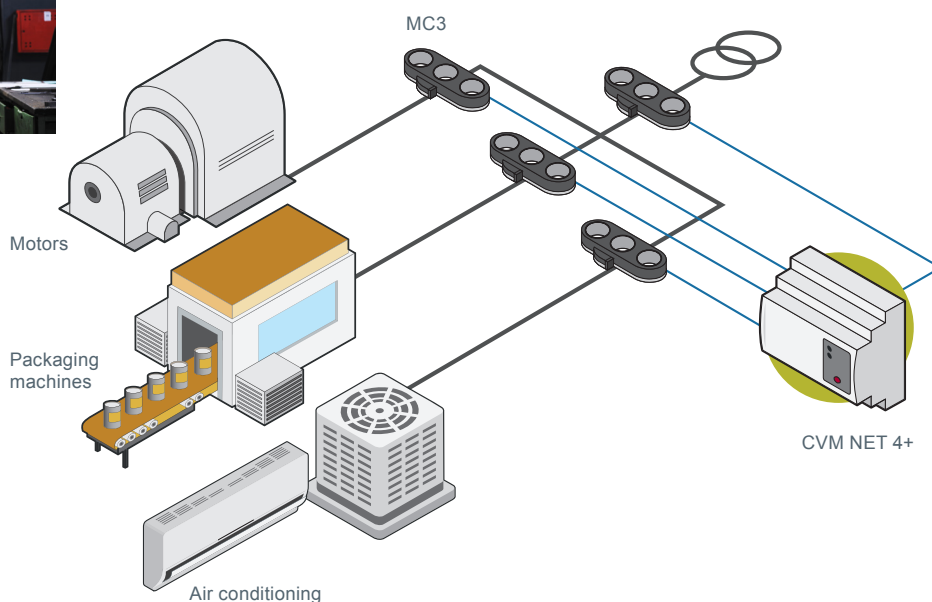3 three-phase + 3 single-phase
2 three-phase + 6 single-phase

Application examples:

Repair shops

Example of the installation of a **CVM-NET4+** in a repair shop with three-phase measuring at the head-end and 3 three-phase lines with efficient transformers of the **MC3** series.
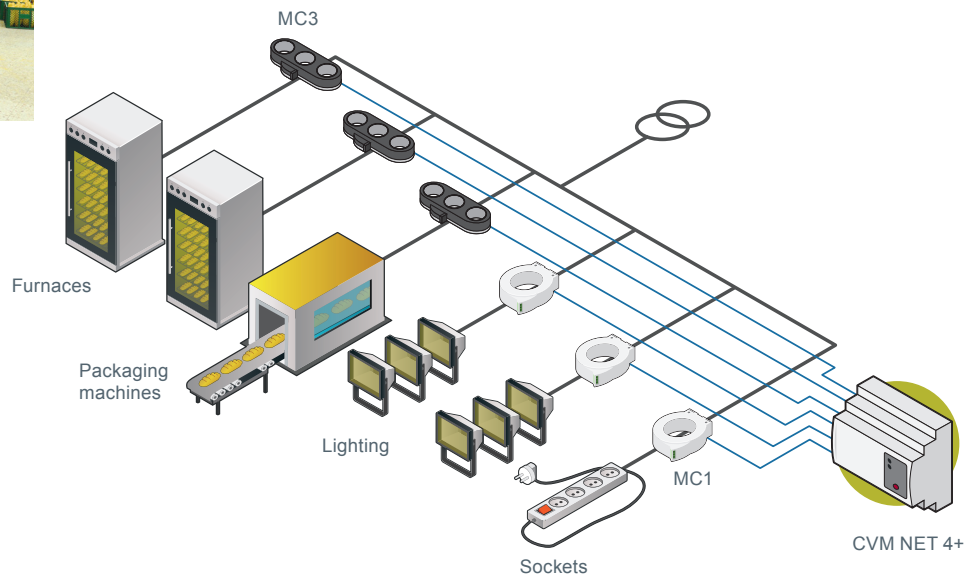
MC3

Motors
Packaging machines
Air conditioning
CVM NET 4+

Services

Example of the installation of a **CVM-NET4+** in a bakery with 3 three-phase lines and 3 single-phase lines with efficient transformers of the MC3 and MC1 series.

MC3

Furnaces

Packaging machines

Lighting

Sockets

MC1

CVM NET 4+

Restaurants

Example of the installation of a **CVM-NET4+** in a restaurant with 2 three-phase lines and 6 single-phase lines with efficient transformers of the **MC3 and MC1** series.

MC3

Refrigerators

Air conditioning

Lighting
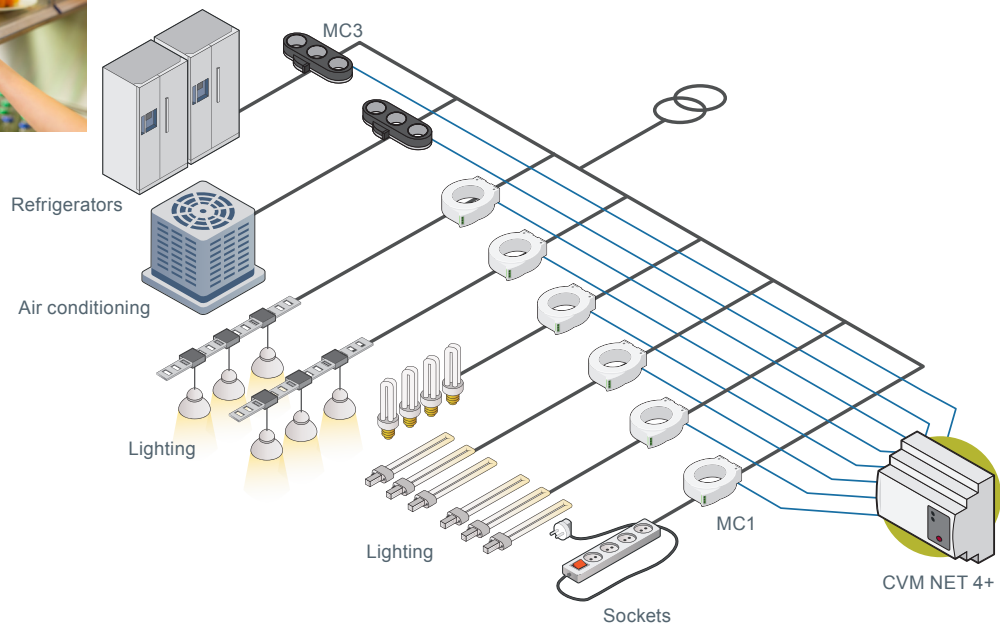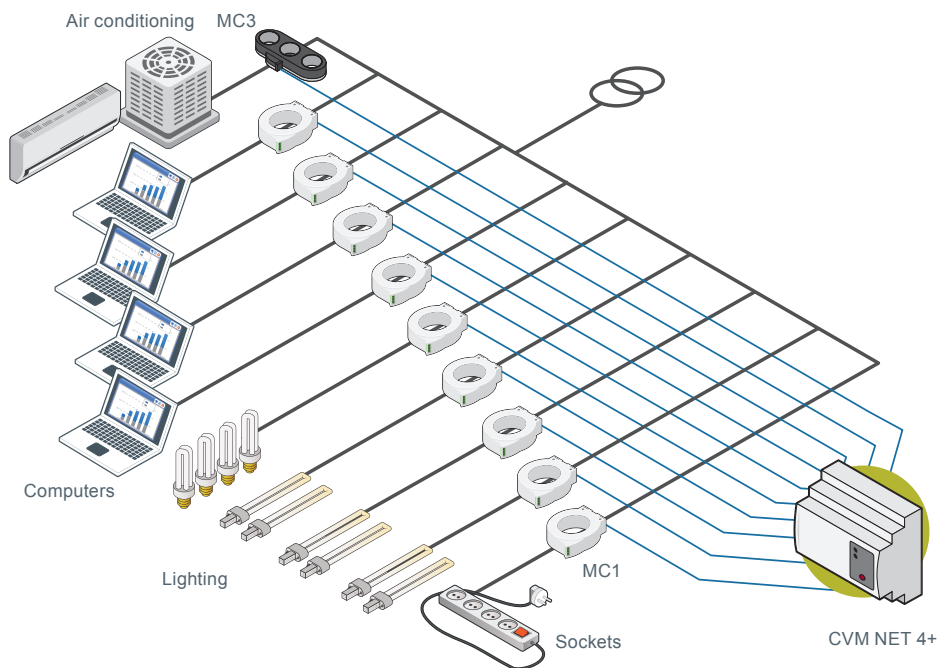
Lighting

Sockets

MC1

CVM NET 4+

Offices

Example of the installation of a **CVM-NET4+** in offices with a three-phase load and 9 single-phase lines with efficient transformers of the **MC3 and MC1** series.

Air conditioning   MC3

Computers

Lighting

Sockets

MC1

CVM NET 4+

Products associated with CVM NET 4 +

Software

PowerStudio Scada and PowerStudio Deluxe
electric energy management and monitoring software

For some time now, **CIRCUTOR** has been developing robust and reliable tools that transfer electrical parameter or consumption information from remote measuring units or laptop devices to a centralised system where the data gathered can be checked and processed. This tool is called **PowerStudio Scada** and it covers all the necessary options for analysing the data gathered and taking decisions to make your installations energy efficient.

Efficient three-phase measurement transformers, specially designed for modular electric panels

The **MC** measurement system offers significant advantages to professionals during the power analyzer and meter implementation and installation phase in electric panels.

The **MC3** system is composed of three efficient transformers in a compact arrangement; its dimensions make it a simple and innovating system for 63A, 125A and 250A panels.

The **MC1** system allows line extensions in electric panels, by simply changing the transformer secondary, as it is a compact multi-range system.

Application

CIRCUTOR's headquarters are located in Viladecavalls (Barcelona) and they are a good example of the implementation of an **Energy Management System (EMS).**

We can classify the different types of consumption by zone and type of use thanks to the measurements taken by units such as the **CVM-NET4+**. Therefore, the task of classifying the types of consumption is relatively simple, always taking into account **where, how and when electrical energy is consumed**, helping take decisions associated with the improvement of electrical energy efficiency.

The installation is controlled with **PowerStudio Scada** energy management software, which can monitor data, produce graphics, tables, Scada screens, reports and alarms, recording all parameters in a database to guarantee system traceability.

In addition, another good example of where the application is used are the data processing centres (DPCs) in which the PUE (Power Usage Effectiveness) is calculated as a variable that measures the efficiency of data centres.

To do so, the three-phase load measurements, such as the input power of the server room, UPS and air conditioning system power, must be combined with the single-phase loads, such as the consumption of the servers at the UPS output. Therefore, data associated with the PUE and UPS losses is gathered, i.e., data on the efficiency of the system. ◗

PUE Efficiency Calculation Scale:

START **2**   ✓**1.4** END
VERY INEFFICIENT   VERY EFFICIENT
3.5   2.9   **PUE**   1.7   1.1
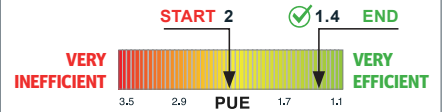
PUE: Power Usage Effectiveness, calculated with the formula:

$$PUE = \frac{\text{Total energy supplied}}{\text{Energy for computer equipment}}$$

Energy management system

Energy Management System (EMS). We can classify the different types of consumption by zone and type of use thanks to the measurements taken by units such as the **CVM-NET4+**.

CVM-NET4+ Multi-channel power analyzer

Powerstudio
.circutor.com

The installation is controlled with **PowerStudio Scada** energy management software, which can monitor data, produce graphics, tables, Scada screens, reports and alarms, recording all parameters in a database.