



Distribution of electrical energy



Technology for energy efficiency

Distribution of electrical energy

*At **CIRCUTOR**, we have been manufacturing and providing systems and equipment for managing energy efficiency for more than 35 years. All the knowledge acquired during this time is reflected in our products, which are reliable, robust, easy to use and most importantly: **innovative**.*

***CIRCUTOR** has equipment for measure power quality, equipment for power factor correction in Medium and Low Voltage, specially designed equipment for maintenance of Power Transformers, equipment for measure and managing electrical energy and a wide range of multifunction electronic meters for metering.*

*This entire range of equipment is used to create an Energy Management System through our powerful, versatile, efficient and intuitive software **PowerStudio SCADA**. Software with which we have created thousands of customized applications for countless types of installations around the world.*

Distribution diagram

Q Power Quality

Power quality guarantees the good performance of electrical energy distribution lines.



Metering / Auxiliary services

Metering and control, either local or remote, allows supervision and management of the distribution lines.

Φ Power Factor

Power factor correction favours efficiency of electrical distribution lines.

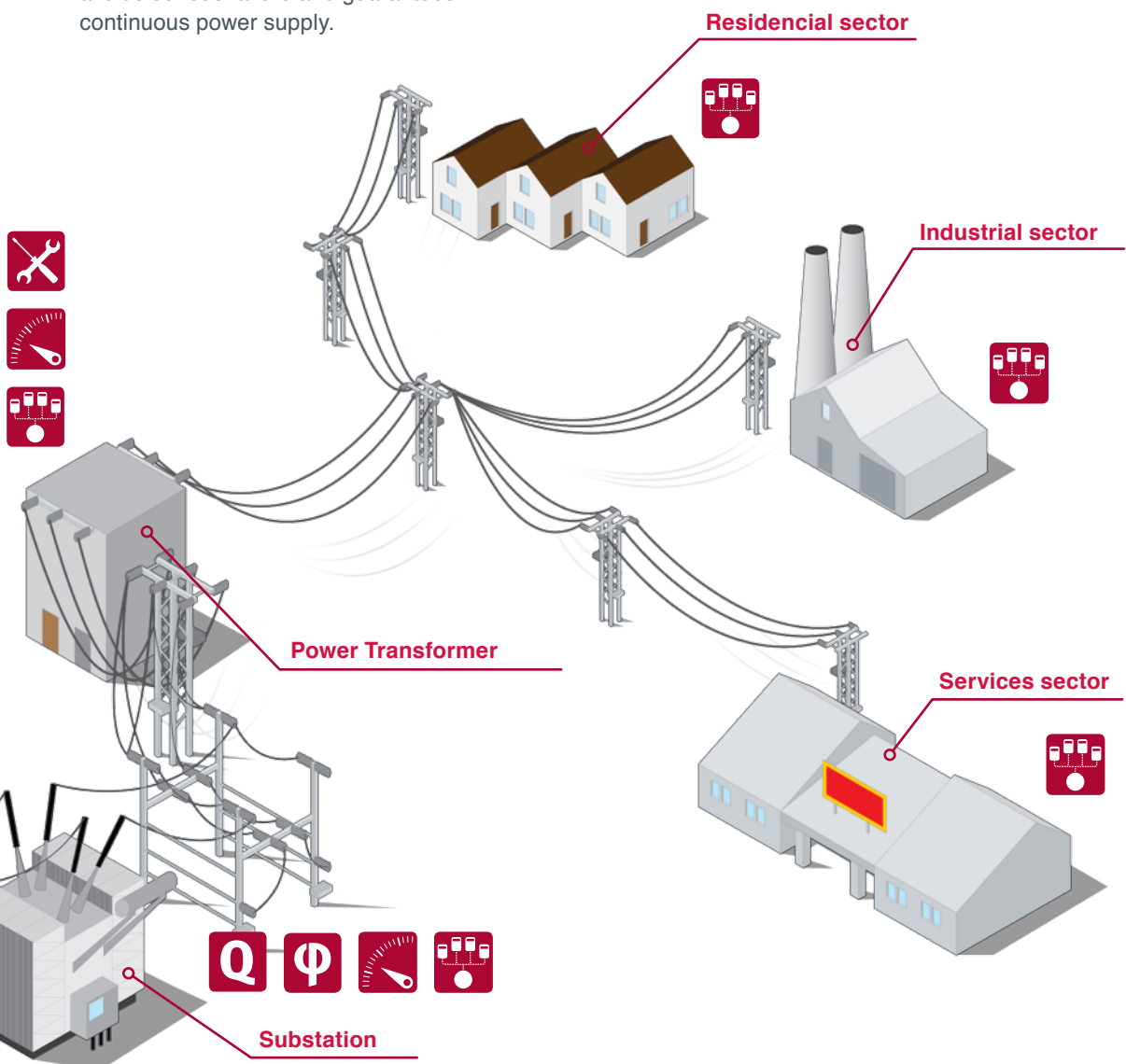


Metering (AMM)

AMM meters are used to manage customer's consumption and remote reading from a Control Center.

Maintenance

Continuous maintenance of the installations avoids serious failure and guarantees continuous power supply.

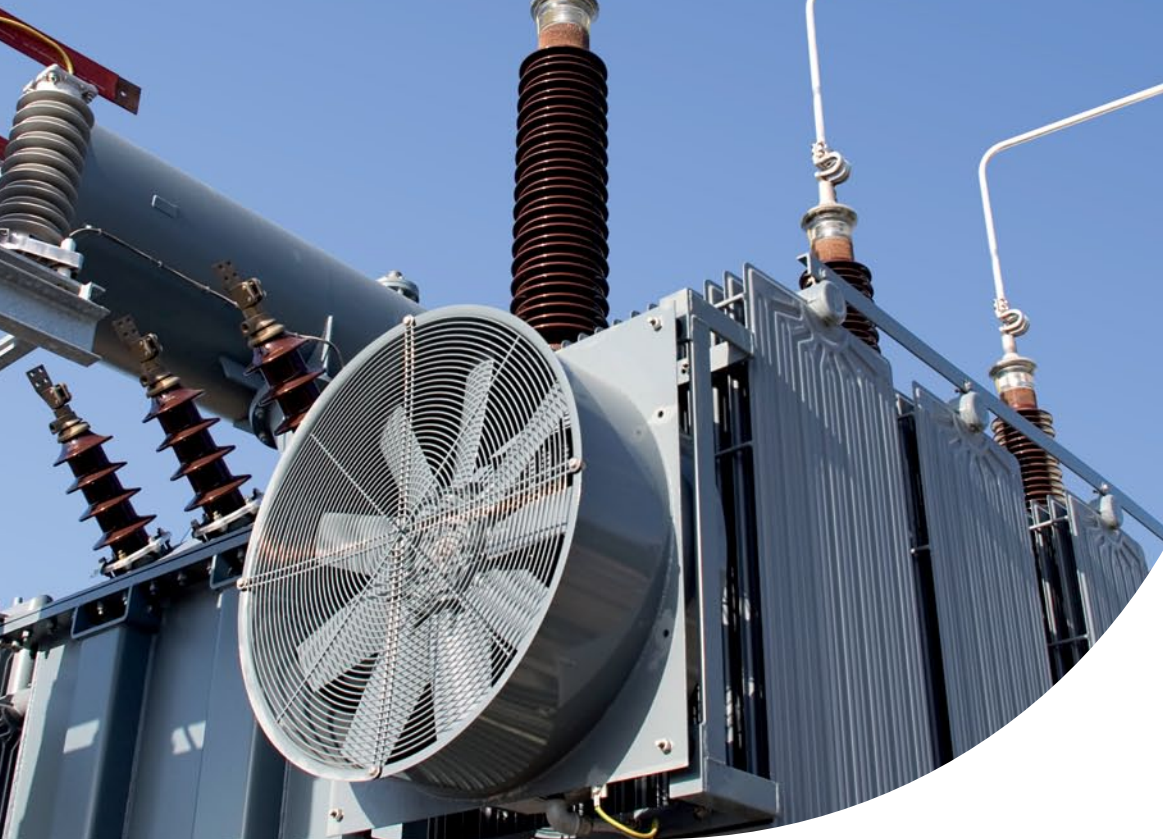


Electrical substation

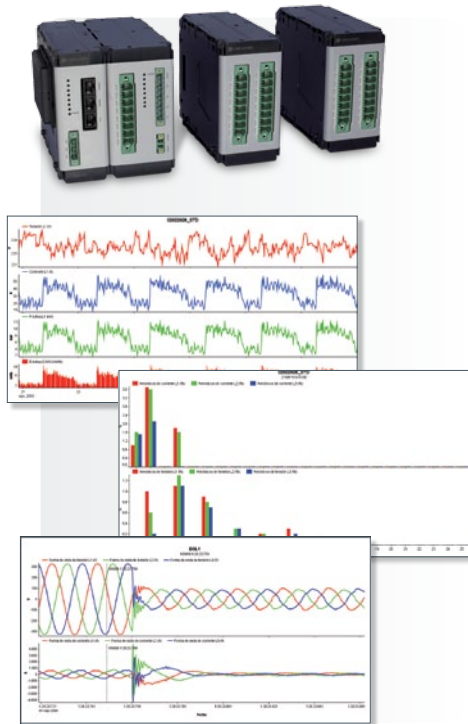


CIRCUTOR has a wide range of specific energy meters for electrical substations, which offer highest performance and accuracy. Moreover, **CIRCUTOR** provide solutions to measure power quality to fully manage power supply of electricity and any event in the grid.

To improve the electrical efficiency and power factor in Medium Voltage, **CIRCUTOR** has a wide range of single and three phase capacitors as well as fixed or automatic capacitor banks to compensate power factor in Medium Voltage.



Q Power Quality



SGE QNA 500

Modular power quality analyzer

Modular and high performance power quality analyzer. In addition to measure all electrical parameters, **SGE-QNA 500** registers any transient detected as well as homopolar currents that can affect to the correct operation of the grid.

It is based in an advanced process system which allows to increase features adding more modules. **SGE-QNA 500** is the best solution to monitoring, data recording and to analyze operations in substations.



QNA 412 / 413

Power Quality analyzers

QNA 412 / 413 are high performance power analyzers certified in accordance with **Standard IEC-61000-4-30 (Class A)**. They enable analysis of power quality (voltage, flicker, harmonic distortion, events, etc.) in any installation. In addition **QNA 412** analyses the consumed power (active and reactive), power factor and consumed or generated energy with class 0.2S accuracy. It also carries out the function of a power analyzer and redundant meter.



CVMk2

Three-phase power and power quality analyzer (balanced and unbalanced)

CVMk2 is an analyzer that measures (in 4 quadrants) in accordance with **EN 50160** more than 500 electrical parameters in three-phase balanced or unbalanced networks. Its modular design consists in a measure module and a *display* (it shows up to 32 additional metering modules). It can be assembled on a 96 x 96 or 144 x 144 panel, with a 4 inch round hole or DIN rail. It can be expanded by means of expansion cards and it has a communication port to transmit data to a SCADA.



Metering / Auxiliary services



CIRWATT 402D

High performance 0.2S type electronic multifunction energy meter

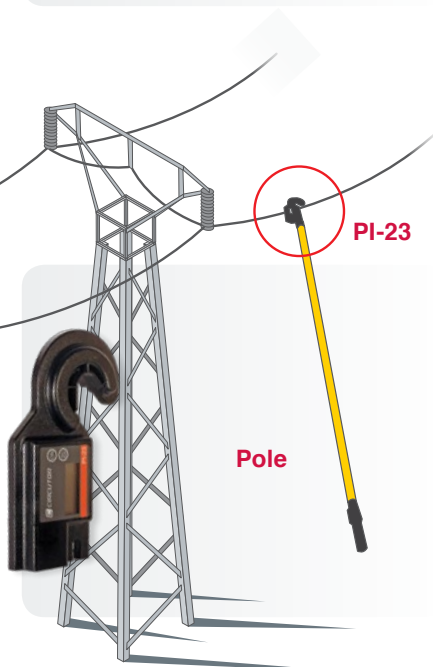
0.2S accuracy electronic energy meter in active energy. It enables measure in 3x57,7 / 100 V up to 3x230 / 400 V. It measures both consumption and generation, and allows maximum flexibility in tariff programming, load profiling and measurement channels, as well as in available communications ports (RS-232, RS-485 or Ethernet). It also includes several expansion cards with digital inputs/outputs to increase options and to adapt it to any requirement.



CIRWATT 502B / 405B

High performance 0.2S and 0.5S electronic multifunction energy meter

CIRWATT 502B (0.2S type in active energy) and **CIRWATT 405B** (0.5S type in active energy) are the new range of electronic energy multifunction meters which offer highest performance for electrical energy substations. These meters include a wide range of measurement channels, load profiling and billing closures. They also have several communications ports and expansion cards with digital inputs/outputs to allow additional management tasks such as alarm monitoring, centralisation of pulses from other devices and even sending pulses for redundant systems.



PI-23

Medium Voltage current Clamp

Open clamps can be used to measure current at points where the electric supply cannot be interrupted. It allows to measure currents in MV, to analyse losses and to prevent an overheating in power cables. Moreover it has a safety system to avoid noise effect of the current clamps when the clamp is situated on or removed from the line.

Power factor correction

Medium Voltage



CHV-M / CHV-T

Single and three phase capacitors

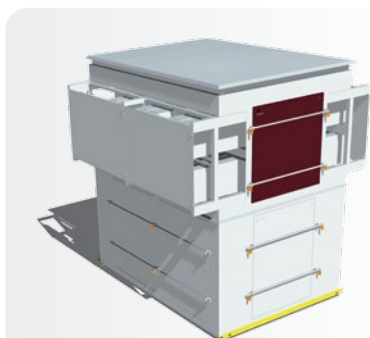
CIRCUTOR has its own technology for designing and manufacturing Medium Voltage capacitors (3.3 kV ... 30 kV), either single-phase (50 ... 600 kvar) or three-phase (50 ... 500 kvar) with a BIL of up to 70/170 kV. Protection of capacitors with internal fuses which disconnects damaged element only. It's design guarantees minimal generation of gases inside the capacitor, resulting in a very low overpressure effect. Elimination of the damaged unit enables the equipment to remain connected and to maintain a continuity in power supply. Individual capacitor tests at 100% in accordance to standard **IEC 60871-1**.



RMV

RMV shock reactors

To limit transitory voltage phenomena and high currents associated with the connection of capacitor banks, it is essential to use **RMV** shock reactors to ensure that the peak values are below that indicated in the Standard **IEC 60871-1** (less than 100 times the nominal current), and therefore maintain the integrity of capacitors, and installation regarding voltage surges.



CIRKAP-C

Fixed or automatic capacitors bank up to 110 kV

CIRKAP-C installed on the closed frame guarantees protection against direct contacts from active parts, economy of space, non-use of safety closures, and the use of internal fuses allows the dimensions of the equipment to be reduced. Possible to include switchgear to protect the capacitor bank or for making an automatic unit.

Advantages

- Fixed, automatic or regulated compensation models
- Detuned filters 7%, 14%, 5.6%, to avoid harmonic effect problems
- Modular design of the cabins
- IP 00 to IP 54 protection degree
- Remote monitoring of the capacitor bank (optionally for the capacitors regulated by the **computer Plus** equipment)

Power Transformer



CIRCUTOR has a wide range of products and solutions for maintenance, measurement, monitoring and power factor correction in Power Transformers. Innovation is present in all products to provide innovative solutions to power utilities, helping to improve maintenance, control and supervision of these facilities.

Power analyzers, protection relays, pulse concentrators and advanced management devices allows full supervision of the power transformer both individually and globally from any available access point by using the powerful software **Power Studio SCADA**.

Finally, **CIRCUTOR** provides a complete and advanced range of standard residential energy meters (single and three phase) as well as advanced energy meters (Smart Meters) with PLC communications which allow to optimize costs, to detect and to reduce fraud and to improve energy balances in power distribution grid and in customer consumption.



Maintenance



AR6 / CIR-e³ / CIR-e^Q

Portable power analyzer

AR6: Portable power analyzer developed using most advanced technologies compared to other portable analyzers. Measure of electrical parameters with 6400 samples per second for each channel. The best option for all types of energy studies to obtain optimum Energy Efficiency.

CIR-e³ / CIR-e^Q: Devices designed to incorporate the newest technologies and the most advanced features on the market in measuring and recording power quality events in electrical networks. Measure standard parameters and power quality parameters with voltage. Configurable by means of a PC application in.



GETEST

Indirect earth contact simulator

The **MPC-5/50 GETEST** is based on the injection of current during a network cycle (maximum safety during use). It enables voltage between ground points (earth voltage) or earth and conductive parts (contact voltage) when there are leakage currents through earth.



MH-100

Microhmometer

The **MH-100** is a portable instrument, controlled by a microprocessor, for highly accurate measure of the very low contact resistance of circuit breakers, switches, busbars, transformer and motor windings, solder points, etc. Test current can be adjusted by the operator and the values are obtained by comparing them with highly stable internal patterns.

Maintenance



MI - MD

Megohmmeter

MD and **MI** portable megohmmeters have been specially designed to measure insulation resistances with values of $T\Omega$, using a test voltage that can be selected by the user. They enable accurate measures and easy reading of insulation of Low and Medium Voltage electrical systems and they are resistant to severe conditions of use.



TL-5

Earth resistance meter

TL-5 earth resistance meter is a digital instrument controlled by a microprocessor. It has been designed to take earth resistance and resistivity measurements, with the use of the Wenner method. **TL-5** unit is fully automatic and easy to use. This instrument is perfect to measure earth systems and, it is also useful for measuring the specific resistivity of the ground.



OT2-60D

Dielectric tester

OT2-60D is an automatic unit specially designed for checking breakdown voltage up to 60 kV, of transformer insulating oils, cables with oil, automatic switches, capacitors, etc. either new or used. The equipment is protected by a strong box with a window, for viewing the oil test. It enables tests to be carried out for different standards.



CR

Relay tester

CR-50, **CR-100** and **CR-250** units include specially designed current generation systems that can check the current trip curve/time of automatic switches and indirect protection relays. Test can be easily carried out. Equipment enables the complete protection system to be checked, including the current transformer.

Maintenance



CITI

Control of Technical Inspection in Installations

A complete management system that controls and manages the entire operation to be followed in obligatory supervisions and technical inspections of industrial installations. Record of inspections, statistical system based on the data from all the revised installations. A complete alarm module and control of defects to be repaired. It guarantees compliance with the periodic revisions and facilitates reports through the server.

Power factor correction Medium Voltage / Low Voltage



STD / Plus

Low Voltage automatic capacitor banks

Capacitor banks have been designed for power factor correction purposes in networks with fluctuating loads and power variations during seconds, so that the switching operations can be carried out by contactors. Easy installation, with the high technology and strength are the main features of STD / Plus products.



CHV / CSB

Medium and Low Voltage Capacitors

CIRCUTOR has been providing Medium and Low Voltage capacitors over more than 30 years. Increased strength and safety features: increase of the useful life of the capacitor, improvement of the thermal characteristics, reduction of total leakages, less environmental impact, space optimisation, etc.



Measure / Auxiliary services



CVMk2

Three-phase power and power quality analyzer (balanced and unbalanced)

CVMk2 is an analyzer that measures (in 4 quadrants) in accordance with **EN 50160** more than 500 electrical parameters in three-phase balanced or unbalanced networks. Its modular design consists in a measure module and a *display* (it shows up to 32 additional metering modules). It can be assembled on a 96 x 96 or 144 x 144 panel, with a 4 inch round hole or DIN rail. It can be expanded by means of expansion cards and it has a communication port to transmit data to a SCADA.



CVM-NRG 96

Three-phase power analyzer (balanced and unbalanced)

CVM NRG-96 is a panel-mounted analyzer, that measures (in 4 quadrants), calculates and displays the main electrical parameters in balanced or unbalanced three-phase networks. It controls active or reactive energy by means of impulse outputs, instantaneous values, maximum and minimum values and the delay of the electrical parameters measured.



CVM-NET

Three-phase power analyzer (balanced and unbalanced)

CVM-NET is a DIN rail power analyzer specially designed for measuring up to 230 electrical parameters and send them these to SCADA software. It has a small size (3 modules) and it can be fixed on a panel (72 x 72 mm) by means of an adaptor front. These features together with the absence of a *display* makes it a powerful and economic analyzer.



TC / TCH / TP

Current transformers

The **TC**, **TCH** transformers (narrow profile, high accuracy) and **TP** (Split core) can be located in installations where space is limited. There is a wide range of diameters and primary current models. They are easily installed, ideal for switch outputs and they measure with high accuracy. They can be located both conventionally as on DIN rails by means of a small accessory.



Measure / Auxiliary services



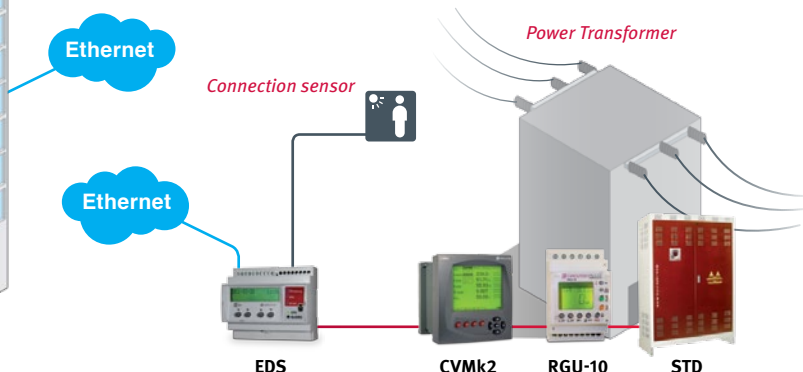
Power
circutor.com **studio**
SCADA

Central offices

EDS

Efficiency Data Server

EDS is a device that has four voltage free digital outlets and four voltage-free digital inputs. The equipment has an integrated Web server that allows any variable to be consulted without any *software* on a computer on the local area network. By means of **EDS** and some power analyzers connected to the unit, user can obtain and centralise information of energy consumptions.



RGU-10

Electronic earth leakage relay WGC series

RGU-10 is a superimmunized type A relay. It has a high frequency and highly immune current filter, true root mean square measure (TRMS) and data visualisation by *display*. **RGU-10** relays linked to the **WGC** transformers allow a smart earth leakage protection ensuring maximum safety and continuity in the electrical service and avoiding unwanted tripping.



WGC

New range of earth leakage current transformers

WGC transformers offer a well thought-out series of improvements for installing the equipment in switchboards in particular. They have improved immunity against transient peaks of current that usually cause residual-current protection trigger. They are available in 6 different diameters for each type of installation without losing the guarantee of insulation. They can be located on the DIN rail.

Metering

PRIME
ALLIANCE



PLC 800

PLC concentrator for PLC meters

PLC 800 is the main device of **CIRCUTOR** Smart Metering systems. Main function is to communicate with all **CIRWATT**-PLC meters installed in the low voltage electrical network and download all the load profiling and billing records. **PLC 800** allows preventive maintenance and monitoring of energy balances and energy losses with the aim of improve the operation of distribution lines.



CIRWATT B

Single-phase and three-phase energy meters

CIRCUTOR has an extensive range of residential single-phase and three-phase meters for standard systems (**102B** and **103B** series) and for Smart Meter systems (**212B** and **410B-RC**). **CIRWATT B** meters range has been certified according to **IEC** and **MID** standards for EC countries. These meters offer the best performance in terms of anti-fraud systems, innovative electronics and communications.



TRMC / TRMC-T

Single-phase / three-phase current transformers for meters with laboratory verification

Current transformers for billing meters in Low Voltage installations. The outer insulating resin gives them a series of features that increase the quality and isolation. It allows to measure with accuracy 0,5S from 100A up to 2000A.



Modem

GSM/GPRS modem

GSM / GPRS base station, suitable for communication at points where no analogue line is available. It can be remotely configured. Indication of coverage by LED. Used to read meters through a GSM/GPRS call. It has two RS-232/RS-485 communications ports that enable data and records to be checked and downloaded from the meter.

Hardware and Software



PowerStudio Embedded 7000

Energy PLC

Platform dedicated exclusively to the management of energy, and therefore, to controlling the energy efficiency of distribution lines and industrial plants. It includes **PowerStudio SCADA**. It has Ethernet and RS-232/RS-485 communications. It can be located on DIN rails and has great power dissipation and high temperature resistance.

PowerStudio SCADA

Management and control Software

PowerStudio SCADA is powerful and simple *software* with a user-friendly interface. It enables complete energy monitoring of power analyzers, meters, earth leakages and total control of various magnitudes in the industrial process field.

PowerStudio, in conjunction with **CIRCUTOR** equipment and systems, adapts to your particular needs by providing the tools demanded by your installations or supervision and control requirements.



- *High-level energy studies*
- *Production ratios*
- *Network quality*
- *Arrangement of the information obtained in graphic and table format*
- *CIRCUTOR metering and control equipment configuration*
- *Real time display of parameters*
- *Creation of databases*
- *Record and view the historical data in graphic or table format*
- *Access the data via XML server*
- *Export to text files and spreadsheets*
- *Access to information through a conventional Internet explorer*
- *Prepare SCADA screens combining different parameters*
- *Generate reports or simulate electric bills*
- *Manage and control events programmed by the user.*

PowerWatt

Software used to manage CIRWATT meters

PowerWatt is a specially designed *software* for interacting with **CIRWATT** multifunction meters.

PowerWatt is designed for remote reading of energy meters and managing energy meters, also enabling flexible energy rating, using an energy consumption profile recorded by a **CIRWATT** meter as its source data.

- *Real time monitoring of the value of the variables metered by the meter*
- *Read the configuration of various parameters*
- *Download files from the units and even program these downloads so they are carried out automatically*
- *Export files to a standard format*
- *Display the download parameters in both table and graphic format.*

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