MEASUREMENT & CONTROL

Solutions for analysis & management for installations

Ulrich Matter AG

Circutor

Solutions for analysis & management for installations

Having information is essential to know, be aware of and take actions that lower energy costs and improve the operations of facilities.

By installing power analyzers, you can determine how, where, when and how much energy you are consuming in your installation. Once connected to the management software, you can track your consumption over time. This will make it possible to view consumption trends and identify areas of improvement so that you can apply corrective measures, assess their benefits and quickly detect any abnormal or inefficient consumption.

Analyzers provide relevant information about the quality of your installation by measuring the level of harmonics, which you can use to determine if they can cause problems in your installation. With this information, you can find the most suitable solution to mitigate harmonics and the effects they have on the loads and elements of your installation.

What are the benefits of installing power analyzers?

- Manage energy consumption (electricity, water or gas)
- Track and reduce unnecessary or inefficient consumption
- Avoid reactive energy or maximum demand penalties
- Detect problems due to the presence of harmonics.

By using the **PowerStudio** Energy Management Software (EMS), you will be able to easily conduct a continuous energy audit of your system and comply with the goals set out in the **ISO 50001** international standard.

ENERGY MEASUREMENT AND MANAGEMENT

Power analyzers

AVAILABLE IN TWO FORMATS

DIN rail

Panel

CVM power analyzers with expansion modules.

KEY FEATURES

Installation in DIN Rail or Panel
A wide range of devices in different formats for installing on any type of surface.

Control with inputs/outputs
Circutor analyzers have inputs for reading pulses from different energy sources or for checking a status (sensors, protection devices, etc.), and outputs for generating alarms for any instantaneous parameter.

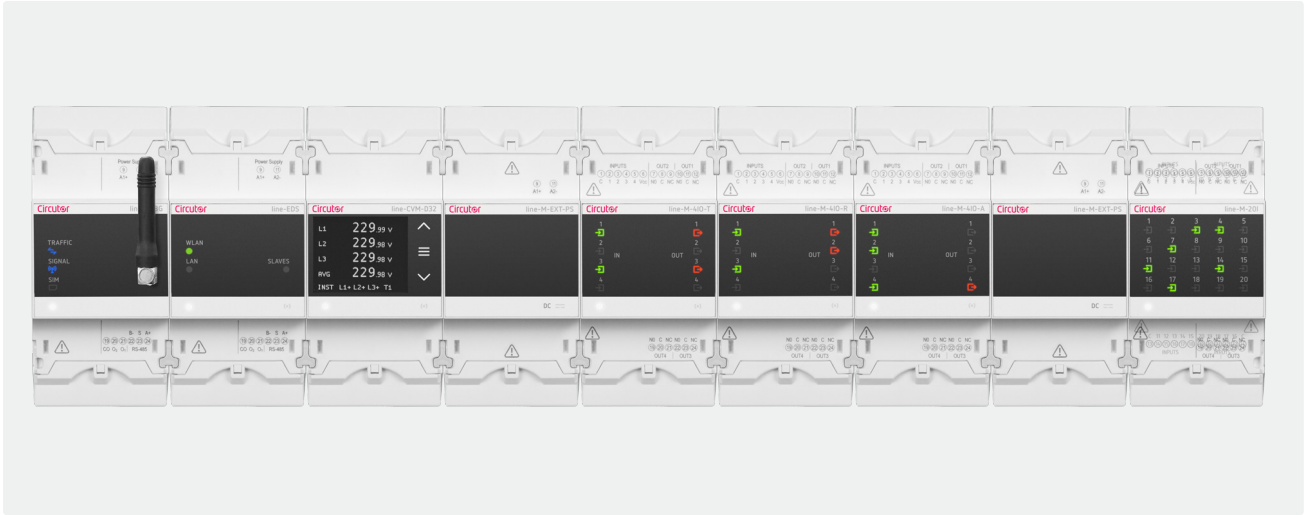
Power quality management
Monitors power quality as per **IEC 61000-4-30**, detects and records voltage events (Overvoltages, dips and interruptions), transients and monitors the CBEMA, ITIC and SEMIF47 curves.

Solutions for Medium and Low Voltage
Especially designed to be connected in any type of power network, whether Low or Medium Voltage, adapting to the needs of each installation.

Communications
Can be integrated into communication systems in different ways, such as RS-485, Ethernet or Wi-Fi with various protocols available.

Compliant with the ISO 50001 Standard
Devices adapted to the requirements specified in the standard, recording any type of energy consumption, from any source, separated by tariffs, type of use or zone.

Flexible sensors to measure current (FLEX).



Expandable with multiple inputs/outputs

Version with EMSi system NEW
New complete range of self-detectable **Line** devices. Easy set-up without the need to connect power supply or communications cables.

Calculate financial costs
The analyzers show the cost associated with any type of energy consumption, both general and that associated with production processes.

Energy Efficiency Measures
Monitor data to improve energy efficiency and environmental management. Circutor devices show CO_2 emissions, adapting to the agreements established to preserve the environment.

FLEX versions
Devices that can be installed without the need to interrupt or shut off the electrical supply, thanks to the use of **FLEX** flexible clamps.

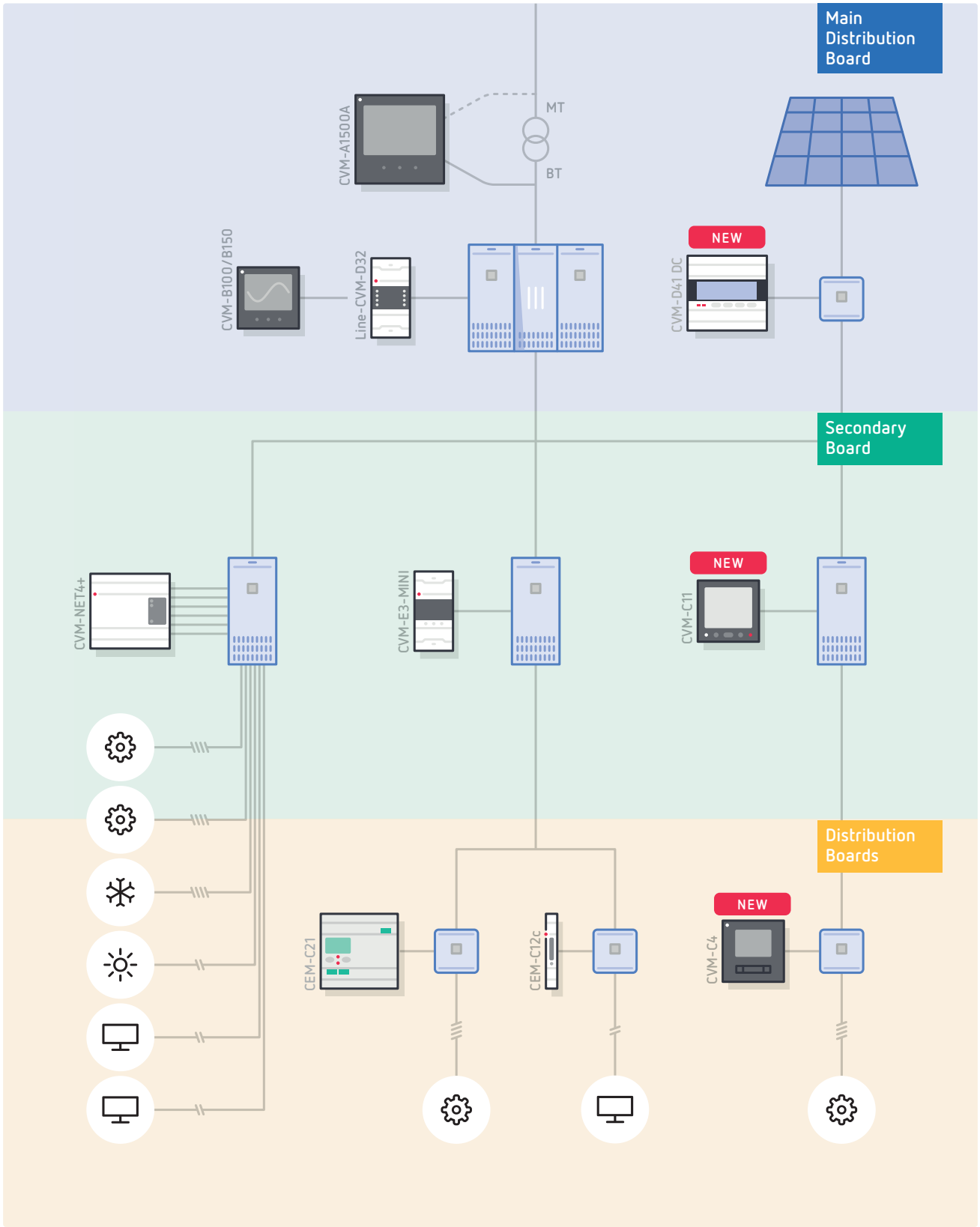
Modular and expandable solutions
Grow your measurement equipment by adding new features, thanks to expansion modules that are connected in the same enclosure.

Free Test Report Center
Download your test reports of Circutor analyzers for free from *testreport.circutor.com*

ENERGY MEASUREMENT AND MANAGEMENT

Power analyzers for any point in the installation

WHERE TO INSTALL THE ANALYZERS



ENERGY MEASUREMENT AND MANAGEMENT

Full range of power analyzers

QUICK SELECTION

Installation in PANEL

Three-phase with indirect connection									
96x96 mm						144x144 mm			
ITF (.../5 A; .../1 A)	ITF (.../5 A; ... /1 A)	MC (.../250 mA)	FLEX sensors	ITF (.../5 A; .../1 A) + MC (.../250 mA)		FLEX sensors			
Modbus RTU	Modbus RTU / BACnet			Modbus RTU / BACnet / Webserver / HTML5 / XML					
RS-485						Ethernet (Web server) + RS-485			
2 Digital outputs + 2 Relay outputs + 2 Digital inputs									
-	Neutral current + 31st harmonics	31st harmonics		Neutral current + 50th harmonics		Neutral current + 63rd harmonics			
-						Power quality			
-				Expandable					
-				Datalogger (optional)		Datalogger			
									
CVM-C4	**CVM-C11**	**CVM-C10**	**CVM-C10**	**CVM-B100**	**CVM-B150**	**CVM-A1500**	**CVM-A1500A**	**CVM-A1500**	**CVM-A1500A**
-ITF-485-ICT2	-ITF-IN-485-ICT2	-MC-485-ICT2	-FLEX-IN-485-I2	-ITF-485-ICT2	-ITF-485-ICT2	-ITF-485-ICT2	-ITF-485-ICT2	-FLEX-485-ICT2	-FLEX-485-ICT2

DIN rail installation

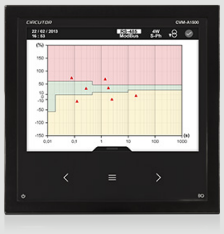
AC networks										DC networks
Direct single-phase	Direct three-phase		Indirect three-phase						Single-phase (12) Three-phase (4)	Indirect single-phase
Direct 100 A	Direct 65 A		ITF (.../5 A; .../1 A) or MC (.../250 mA)	FLEX sensors	ITF (.../5 A; .../1 A) or MC (.../250 mA)	FLEX sensors	ITF (.../5 A; .../1 A) + MC (.../250 mA)	ITF (.../5 A; .../1 A) or MC (.../250 mA)	MC (.../250 mA)	Shunt (DC)
Modbus RTU	-	Modbus RTU	Modbus RTU / BACnet		Modbus TCP		Modbus RTU			
RS-485	-	RS-485			Ethernet / Wi-Fi		RS-485			
-	1 Digital output		1 Digital output + 1 Digital input		-		2 Digital outputs		4 Digital outputs	2 Digital outputs + 1 Analogue output + 2 digital inputs
-							Expandable - BUS Line	-		
-			31st harmonics				40th harmonics	-	15th harmonics	-
										
CEM-C12c	**CEM-C21**		**CVM-E3-MINI**				**Line-CVM-D32**	**CVM-NET**	**CVM-NET4+**	**CVM-D41 DC**
CEM-C12c	-T1	-485- T1	-ITF-485-IC -MC-485-IC	-FLEX-485-IC	-ITF-WiEth -MC-WiEth	-FLEX-WiEth	Line-CVM-D32	-ITF-485-C2	-ITFMC-RS485-C4	- DC mA -DC V

ENERGY MEASUREMENT AND MANAGEMENT

Power analyzers for AC networks

CVM-A1500

Power quality analyzer



- Class A certificate as per **IEC 61000-4-30**
- **EN 50160** Analysis
- Logging of events and transients
- Class 0.2S in active energy
- .../5 A; .../1 A; .../250 mA or **FLEX**
- Memory (1 year of data)
- EMS software with integrated web server
- Up to 3 expansion modules

144 x 144 | 2 digital outputs | 2 relay outputs | 2 digital inputs | RS-485 Modbus | RS-485 BACnet | Ethernet Modbus | Datalogger | Wave form | Flex optional

NEW

CVM-C11

Power analyzer

- Up to 400 variables
- Class 0.5S in active energy
- .../5 A; .../1 A
- Neutral current
- 3 tariffs
- RS-485 (Modbus/BACnet)
- Up to 31st harmonic

96 x 96 | 2 digital outputs | 2 relay outputs | 2 digital inputs | RS-485 Modbus | RS-485 BACnet

CVM-B100/150

Power analyzers, high performance

- Over 500 variables
- Class 0.5S in active energy
- .../5 A; .../1 A ; .../250 mA
- Up to 50th harmonic
- Custom made screens
- Up to 4 expansion modules
- Neutral current

96 x 96 B100 | 144 x 144 B150 | 2 digital outputs | 2 relay outputs | 2 digital inputs | RS-485 Modbus | RS-485 BACnet | Modular | Ethernet optional

CVM-C10

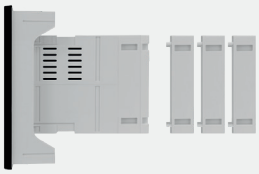
Power analyzer

- Up to 400 variables
- Class 0.5S in active energy
- .../250 mA or FLEX
- Neutral current
- RS-485 (Modbus/BACnet)
- Up to 31st harmonic

96 x 96 | 2 digital outputs | 2 relay outputs | 2 digital inputs | RS-485 Modbus | RS-485 BACnet | Flex optional

M-CVM-AB

Expansion modules for CVM-A/CVM-B analyzers



- **M-CVM-AB-8I-8OTR** → 8 digital inputs + 8 digital outputs
- **M-CVM-AB-8I-8OR** → 8 digital inputs + 8 relay outputs
- **M-CVM-AB-4AI-8AO** → 4 analogue inputs + 8 analogue outputs (0/4...20mA)
- **M-CVM-B-DATAGOLOGGER** → Integrated EMS software + 1 year memory
- **M-CVM-AB-Modbus-TCP (bridge)** → Ethernet Gateway + RS-485 (bridge)
- **M-CVM-AB-Modbus-TCP (switch)** → Ethernet Gateway for loop between analyzers
- **M-CVM-AB-MBUS** → M-BUS Communications
- **M-CVM-AB-LonWorks** → LonWorks Communications
- **M-CVM-AB-Profibus** → Profibus Communications

NEW

CVM-C4

Power analyzer

- Up to 230 variables
- Class 0.5S in active energy
- .../5 A; .../1 A
- RS-485 (Modbus)
- Total harmonic distortion (THD%)

96 x 96 | 2 digital outputs | 2 relay outputs | 2 digital inputs | RS-485 Modbus

ENERGY MEASUREMENT AND MANAGEMENT
Power analyzers for AC networks

ENERGY MEASUREMENT AND MANAGEMENT
Power analyzers for DC networks

ENERGY MEASUREMENT AND MANAGEMENT

Power analyzers for AC networks

CVM-E3-MINI

Power analyzer

- Up to 400 variables
- Class 1 in active energy
- .../5 A; .../1 A or.../250 mA or FLEX
- Up to 31st harmonic

3 modules DIN rail | RS-485 Modbus | RS-485 BACnet | 1 transistor output | 1 digital input | Flex optional

CVM-E3-MINI-WiEth

Power analyzer

- Up to 400 variables
- Class 1 in active energy
- .../5 A; .../1 A or .../250 mA or FLEX
- Up to 31st harmonic

3 modules DIN rail | Wi-Fi | Modbus TCP | Flex optional

Line CVM-D32

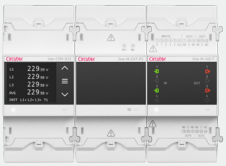
Power analyzer

- Up to 500 variables
- Class 1 in active energy
- .../5 A; .../1 A or .../250 mA
- Up to 40th harmonic
- Event counter
- I/O expandable

3 modules DIN rail | 2 digital outputs | RS-485 Modbus | Bus Line

Line-M

Expansion modules for Line-CVM-D32



- **Line-M-4I0-R** → 4 digital inputs + 4 relay outputs
- **Line-M-8I60** → 8 digital inputs + 6 relay outputs
- **Line-M-4I0-T** → 4 digital inputs + 4 digital transistor outputs
- **Line-M-4I0-RV** → 4 digital inputs (voltage) + 4 relay outputs
- **Line-M-4I0-A** → 4 analogue inputs + 4 analogue outputs

Bus Line

CVM-NET4+

Multi-channel power analyzers

- 4 three-phase or 12 single-phase channels
- Up to 230 variables per channel
- Class 1 in active energy
- .../250 mA

6 modules DIN rail | 4 digital outputs | RS-485 Modbus

CVM-NET

Power analyzer

- Up to 230 variables
- Class 1 in active energy
- .../5 A; .../250 mA

3 modules DIN rail | 2 digital outputs | RS-485 Modbus

ENERGY MEASUREMENT AND MANAGEMENT

Measurement transformers

ENERGY MEASUREMENT AND MANAGEMENT

Accessories for communications

ENERGY MEASUREMENT AND MANAGEMENT

Power analyzers for AC networks

CEM-C21

Energy meter
with analysis of electrical variables

- Direct three-phase measurement
- 65 A
- 3x 230 V/400 V
- Class 1 in active energy (**IEC 62053-21**)
- Class 2 in reactive energy (**IEC 62053-23**)
- V, A, kW, kvar, kWh, Kvarh, Hz, CO_2, energy cost

3 modules DIN rail | 1 dual-tariff input (DS) | 1 digital output (T1) | RS-485 Modbus | IEC | MID

NEW

CEM-C12c-MID

Energy meter
with analysis of electrical variables

- Direct single-phase measurement
- 100 A
- 1x 230 V
- Class 1 in active energy (**IEC 62053-21**)
- Class 2 in reactive energy (**IEC 62053-23**)
- V, A, kW, kvar, kWh, kvarh, Hz, CO_2, energy cost

1 module DIN rail | RS-485 Modbus | IEC | MID

ENERGY MEASUREMENT AND MANAGEMENT

Power analyzers for DC networks

NEW

CVM-D41

Power analyzers

- Direct three-phase voltage measurement up to 1500 Vdc
- Up to 600 mV (via Shunt)
- Class 1 in active energy
- V, A, kW, kWh (DC)
- Analogue output (0/4... 20 mA or 0/2... 10 V)

6 modules DIN rail | 2 relay outputs (alarm) | 2 digital inputs | 1 analogue output | RS-485 Modbus

SH

Shunts for measuring
direct current

- From 1 A to 20,000 A
- 0.5 or 1 accuracy
- Secondary.../60 mV
- Other secondary on demand (from.../50 mV to 600 mV)

ENERGY MEASUREMENT AND MANAGEMENT

Accessories for communications

Line-TCPRS1

RS-232/RS-485
to Ethernet/Wi-Fi converter

- RS-232 or RS-485 to Ethernet/Wi-Fi
- Settings from app and web server
- Bus-Line connection (Up to 8 devices)
- 32 devices via the RS-485

3 modules DIN rail | RS-232 Modbus | RS-485 Modbus | Ethernet Modbus TCP | Ethernet TCP | Ethernet UDP | Bus Line

TCPRS1+

RS-485 to Ethernet/Wi-Fi converter

- RS-485 to Ethernet/Wi-Fi
- Settings from app and web server
- 32 devices via RS-485

2 modules DIN rail | RS-485 Modbus | Ethernet Modbus TCP | Ethernet TCP | Ethernet UDP

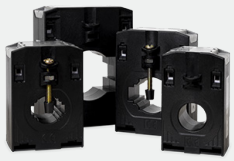
ENERGY MEASUREMENT AND MANAGEMENT

Current transformers to analyze AC networks

TD

Closed-core transformers

- From 40 A to 4000 A
- .../5 A ; .../1 A or.../250 mA
- DIN connection Panel or busbar/cable
- Sealable
- Flange fastening
- Encapsulated (optional)
- Low losses



TQ

Open-core transformers

- From 100 A to 1000 A
- .../5 A ; .../1 A or.../250 mA
- DIN connection/Panel or busbar/cable
- Button release to open
- Sealable
- Low losses

MC1

Efficient single-phase transformers

- Single-phase connection
- From 50 A to 2000 A
- Diameter from 20 mm to 80 mm
- .../250 mA
- Triple scale
- Small size

MC3

Efficient three-phase transformers

- Three-phase connection
- From 63 A to 250 A
- Diameters (7.1/14.6/26 mm)
- .../250 mA
- Easy installation
- Optimized space

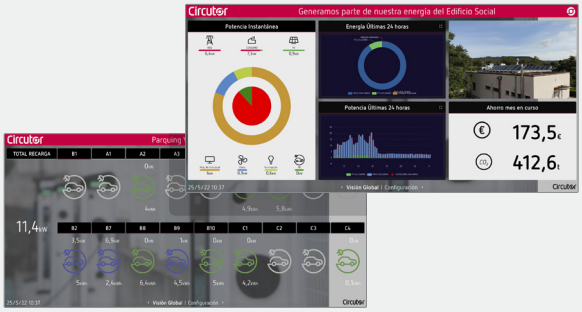
ENERGY MEASUREMENT AND MANAGEMENT

Software

Line-EDS-iMonitor

Integrated solution for monitoring consumptions and photovoltaic generation for facilities and public administrations

- Instantaneous power graph: Network demand, generation and consumption
- Instantaneous power graph per load or type of consumption
- Energy accumulated during the current month
- Consumption graph in user-adjustable period
- Power trend graph (last 24h, day, week, month or year)
- Instantaneous solar radiation
- Outside temperature
- Weather forecast
- Monthly savings
- Lower CO_2 emissions
- Interactive images of the installation
- Export dashboards to corporate website
- Monitor consumption and status of electric vehicle chargers.

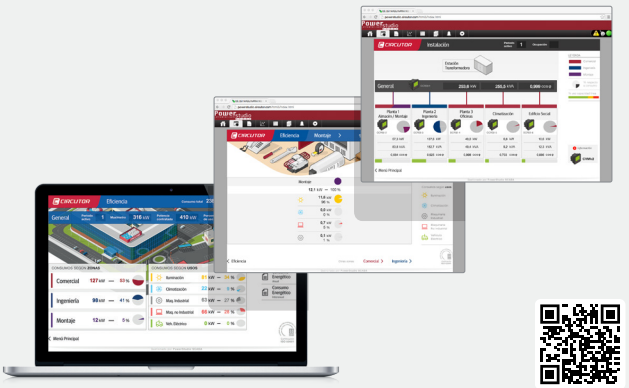


PowerStudio SCADA

Energy Management Software

Data control and acquisition system with real-time monitoring, reporting, alarm management and SCADA interface to create simple diagrams. The main features are as follows:

- Creation of databases
- Event log
- Energy cost management
- Energy balance
- Energy consumption ratio
- Consumption reports
- Alarm tables
- Energy quality management
- Compatible with other SCADA programs on the market
- Analysis and management of variables
- Energy/production ratio
- Cost/production ratio
- Essential tool for the **ISO 50001** certification.



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