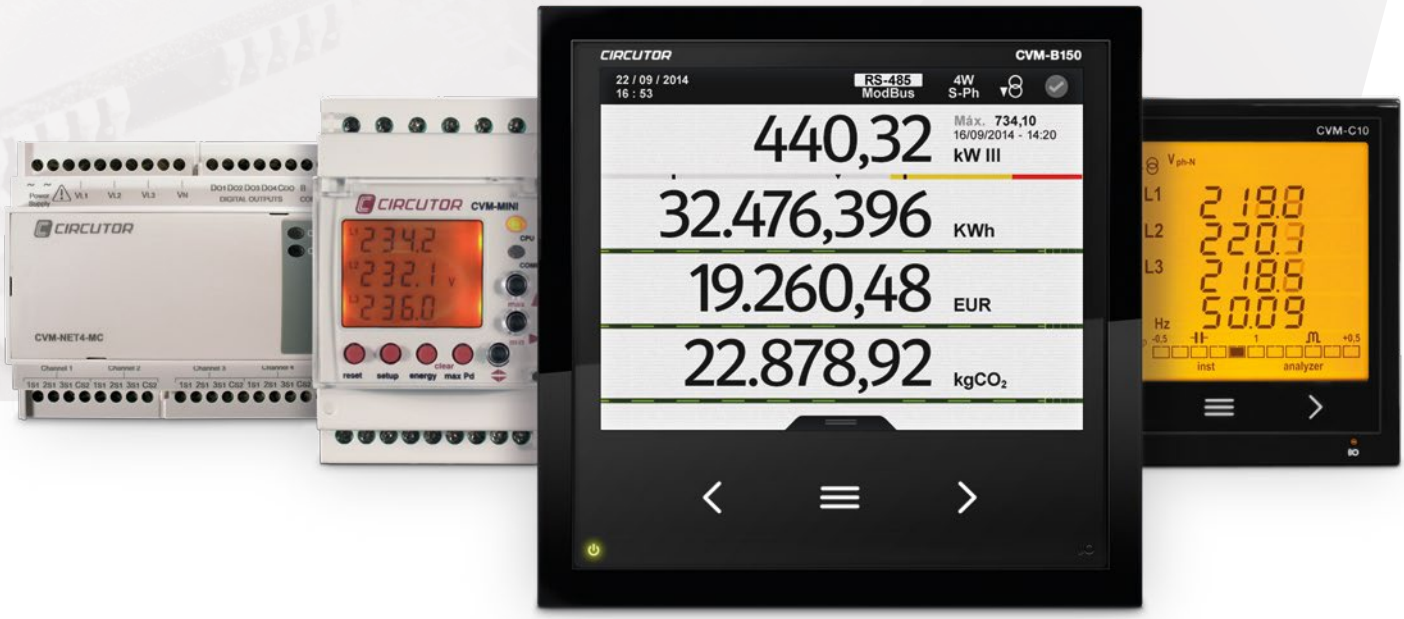
Measurement and Control

CVM

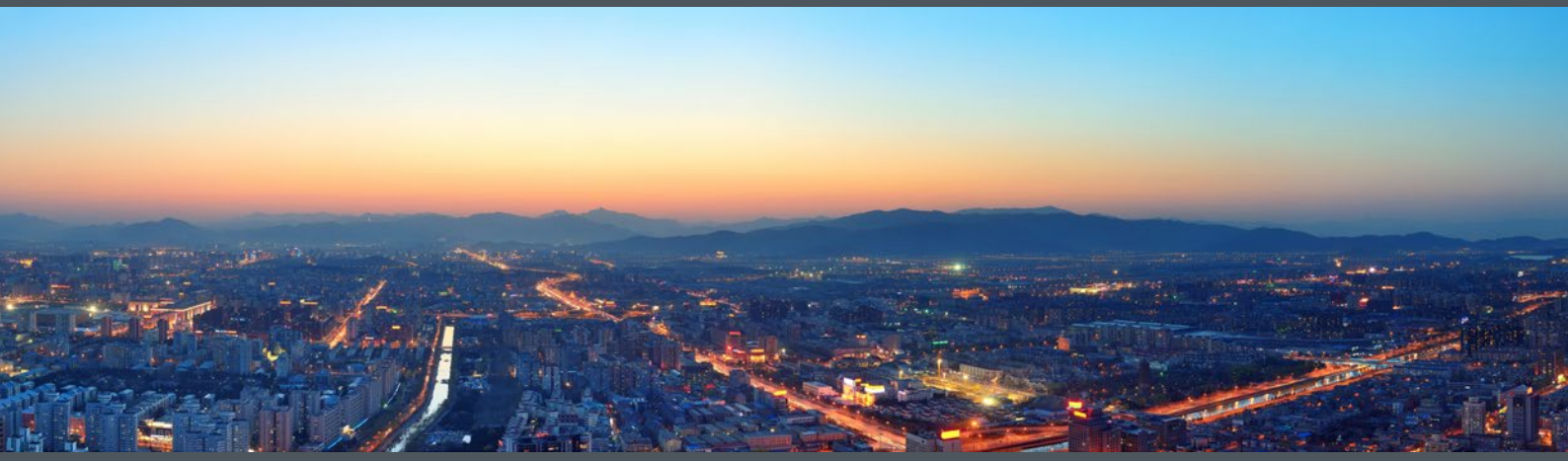
Power analyzers



CIRCUTOR

Energy efficiency technology

More than simply measuring...



Manage
Record the real cost of your manufacturing processes and the $kgCO_2$ emissions of your installation during different time bands.

Quantify
Record the total cost of electrical energy consumed by your installation, including the operating time of each line, process or activity.

Analyse
Obtain information about a large number of electrical variables in real time to achieve the maximum energy efficiency of your installations.

And much more...
Use your inputs and outputs to manage loads and processes, and to combine different communication modes used in your installation to gather data.

A vast range of possibilities

Users need increasingly advanced measurement, control and management systems, as a result of the perpetual growth of energy costs. **CIRCUTOR** offers a wide range of power analyzers that can cater for the most demanding needs of its customers.

CIRCUTOR, a leading company in the Electrical Energy Efficiency sector, offers units that can measure many different electrical parameters, such as energy meters and management software, allowing customers to control and optimise the performance of their installations.

CIRCUTOR

We offer solutions

Much more than a power analyzer

CIRCUTOR's power analyzers are much more than a simple power analyzer. These units feature many different communication options, inputs and outputs used to control consumption and industrial processes and they can manage any type of alarm. In addition, the user can calculate the cost of energy, $KgCO_2$ emissions and the operating time of their production processes. Units communicate via our **PowerStudio SCADA** monitoring and management software, a system that provides all information required for implementing real time actions and for preparing studies and reports about the behaviour of your network.

The most complete range

Our products are suited to any type of installation and space; they can be mounted on a panel or DIN rail in both High and Low Voltage installations. Our offer ranges from the most complete unit with a 0.5S energy accuracy that measures up to the 50th harmonic, communications and more than 700 variables, to the most basic unit, which measures the main electrical parameters and without communication system. All of our analyzers are very easy to install helping to save time and money.

Always with our customers in mind

CIRCUTOR has a vast network of professionals that are always ready to help you choose the best product, adapted to your needs and those of your customers. In addition, our technical assistance service is always there to help you, guaranteeing the success of your projects.

We offer products that have been exclusively design to help our customers enter or consolidate their position in the electrical energy efficiency sector. Discover our winning formula:

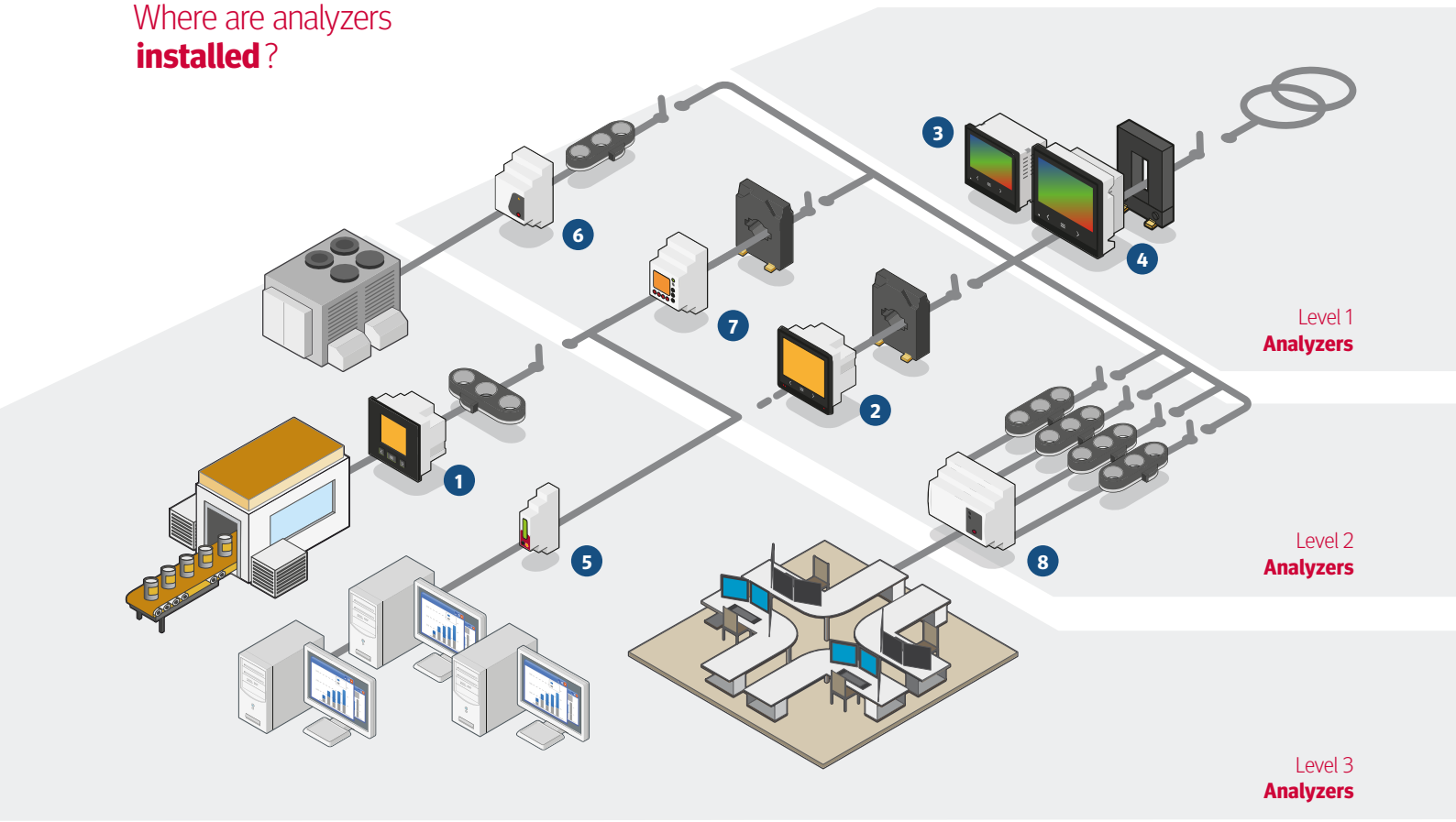
[MEASUREMENT + MANAGEMENT = SAVINGS]

Why should you install a **power analyzer**?

Gathering information is vital to know, understand and perform actions that reduce the cost of energy.

- Learn more about where and when you are consuming
- Control and reduce unnecessary and inefficient consumption
- Anticipate possible penalties due to excess power or the consumption of reactive energy and remove them from your electricity bill
- The software can perform a continuous and simple energy and electric audit (connect to http://powerstudio.circutor.com)

Where are analyzers **installed**?



PANEL MOUNTED ANALYZERS

1. **CVM-C5.** Multifunction multimeter with energy meter.
2. **CVM-C10.** Three-phase power analyzer with RS-485 communications
3. **CVM-B100.** High-performance three-phase power analyzer with communication system (96x96 mm)
4. **CVM-B150.** High-performance three-phase power analyzer with communication system (144x144 mm)

ANALYZERS FOR ASSEMBLY ON DIN RAIL

5. **CVM-1D.** Basic single-phase power analyzer, 1 module.
6. **CVM-NET.** Indirect three-phase power analyzer with RS-485 communications.
7. **CVM-MINI.** Indirect three-phase power analyzer with LCD display and communication system.
8. **CVM-NET4.** Indirect three-phase power analyzer for 4 three-phase networks with RS-485 communications.

Panel mounted **power analyzer**

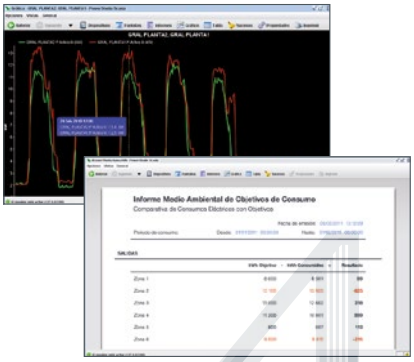
The **CVM** series of panel mounted analyzers (96x96 or 144x144) features very accurate units, which have been designed to control and supervise the main electrical parameters of different network topologies: Single-phase, Two-phase with or without neutral and Three-phase with or without neutral. The unit features two indirect current inputs, either with .../5 A, .../1 A secondary or with **MC1** and **MC3** efficient transformers (.../250 mA). The units feature ITF technology: galvanic insulation protection.
In addition, these analyzers can perfectly cater for new market needs, providing information associated with Electrical Energy Efficiency management parameters, showing different variables, such as: $kgCO_2$ Emissions, Cost of energy and Operating time. The different combinations of inputs and outputs can check your installation to prevent and/or improve processes. This is why it has become **the most original range in the market**, offering a series of advantages, such as: Modular and Expandable System, Communications, Definition of custom screens, Colour graphical display (digital and analogue), etc.

CVM-C5 **CVM-C10** **CVM-B100 / CVM-B150**

Power analyzers **for assembly on DIN rail**

The **CVM** series of DIN rail analyzers features units that have been especially designed for installation on switchboards or industrial machinery. Their main purpose is to control and supervise the main electrical parameters of different network topologies: Single-phase, Two-phase with or without neutral and Three-phase with or without neutral.

The CIRCUTOR range of analyzers can cater for different market needs, with direct single-phase connection (up to 32 A) and models with indirect current inputs, either with a .../5 A , .../1 A secondary (depending on the model) or with **MC1** and **MC3** efficient transformers (.../250 mA). The units feature ITF technology: galvanic insulation protection Therefore, CIRCUTOR offers a wide range of power analyzers for assembly on DIN rails to the market, which take up less space on electric panels, while offering a great number of possibilities.



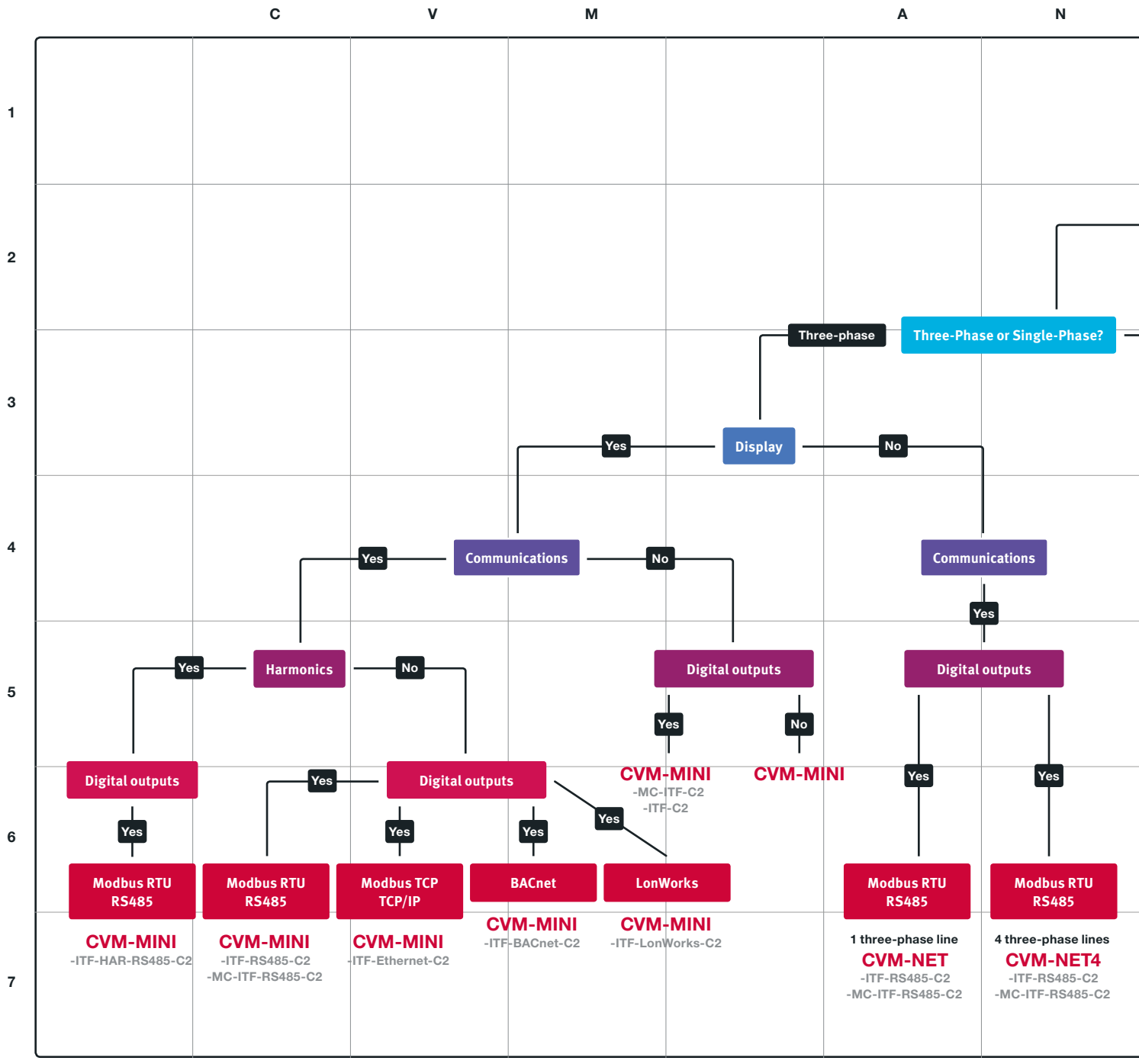
CVM-1D **CVM-NET** **CVM-MINI** **CVM-NET4**

PowerStudio

Permanently communicated

You can get the most out of the models with built-in communication systems when they are combined with **PowerStudio**, CIRCUTOR's energy monitoring and supervision software. In addition, **PowerStudio SCADA**, can display electrical parameters in real time, generating a database in the computer, which will store the log of values that can be analysed exhaustively later on.

Selection guide



CVM-C5 | CVM-C10 | CVM-B100 | CVM-B150 | CVM-1D | CVM-NET | CVM-MINI | CVM-NET4

A L Y Z E R

What analyzer should I choose?

Assembly on DIN rail or Panel mounted?

- **DIN rail**
  - Single-phase
    - Digital outputs
      - Yes
        - MID
          - Yes
            - Communications
              - Yes
                - Modbus RTU RS485
                - **CVM-1D** -RS485-C-MID
              - No
                - **CVM-1D** -C-MID
          - No
            - Communications
              - Yes
                - Modbus RTU RS485
                - **CVM-1D** -RS485-C
              - No
                - **CVM-1D** -C
- **Panel**
  - Energy efficiency parameters
    - Yes
      - Digital outputs
        - Yes
          - 96x96 or 144x144?
            - 96
              - Communications
                - Yes
                  - Modular/Expandable
                    - Yes
                      - Modbus RTU RS485 / BACnet
                      - **CVM-B100** -ITF-485-ICT2 *Expansion modules p. 19
                    - No
                      - Modbus RTU RS485 / BACnet
                      - **CVM-C10** -ITF-485-ICT2 -MC-485-ICT2 -ITF-IN-485-IC2
                - No
                  - **CVM-C5** -IC -MC-IC
            - 144
              - Communications
                - Yes
                  - Modular/Expandable
                    - Yes
                      - Modbus RTU RS485 / BACnet
                      - **CVM-B150** -ITF-485-ICT2 *Expansion modules p. 19

Comparison table
PANEL mounted



		CVM-C5-IC	CVM-C5-MC-IC	CVM-C10-ITF-485-ICT2
Power circuit	**Power supply voltage**	85-265 Vac / 95-300 Vdc	85-265 Vac / 95-300 Vdc	85-265 Vac / 95-300 Vdc
	Frequency	50…60 Hz	50…60 Hz	50…60 Hz
	Consumption	3.5 VA; 2W	3.5 VA; 2W	3.5…6 VA; 2…6W
	Maximum consumption	<6 VA ; < 6 W	<6 VA ; < 6 W	<6 VA ; < 6 W
	Installation category	CAT III (300V)	CAT III (300V)	CAT III (300V)
Voltage measurement circuit	**Voltage**	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)
	Voltage measurement margin	5…120% (U_n)	5…120% (U_n)	5…120% (U_n)
Current measurement circuit	**Nominal current**	…/5 A or …/1 A	…/250 mA (MC)	…/5 A or …/1 A
	Maximum current	1.2 I_n	1.2 I_n	1.2 I_n
	Current measurement margin	0.2…120% I_n	2…120% I_n	0.2…120% I_n
	Neutral current	-	-	-
Sampling	**Samples/cycle**	32	32	64
Accuracy	**Voltage**	0.5%	0.5%	0.5% + 1 digit
	Current	0.5%	0.5%	0.5% + 1 digit
	Active power	1%	1%	0.5% + 2 digits
	Reactive power	1%	1%	1% + 2 digits
	Active Energy	1% (Class 1)	1% (Class 1)	1% (Class 1)
	Reactive Energy	1% (Class 1)	1% (Class 1)	2% (Class 2)
Digital transistor outputs (NPN)	**Quantity**	1	1	2
	Maximum voltage	24 Vdc	24 Vdc	24 Vdc
	Maximum current	50 mA	50 mA	50 mA
	Weight	Configurable	Configurable	Configurable
Digital relay outputs	**Quantity**	-	-	2
	Maximum voltage, open contacts	-	-	250 Vac
	Thermal current (I_{th})	-	-	6 A
	Maximum switching power	-	-	1500 VA (250 Vac / 5 A)
Potential-free digital inputs	**Insulation**	Optoisolated	Optoisolated	Optoisolated
	Quantity	1	1	2
Parameters	**V, A, W, Wh, var, cos φ**	•	•	•
	Quadrants	4	4	4
	THD	•	•	•
	Harmonics	-	-	31
	Parameters, per phase	-	-	•
	Maximum demand	-	-	•
	Tariffs	2	2	3
	Hours, Cost, kgCO²	•	•	•
	Single-phase measurement	•	•	•
	Three-phase measuring	•	•	•
Front panel	**Display**	LCD	LCD	Custom COG LCD
	Buttons	Silicone Button	Silicone Button	Capacitive
Communications	**RS-485**	-	-	•
	TCP/IP	-	-	-
Protocols	**ModBus/RTU**	-	-	•
	ModBus/TCP	-	-	-
	BACnet	-	-	-
	LonWorks	-	-	-
	Mbus	-	-	-
Expandable	**Additional modules**	-	-	-
Standards	**Designed according to UL**	-	-	•
	Designed according to MID	-	-	•
Environmental features	**Operating temperature**	-5°C... +45°C	-5°C... +45°C	-5°C... +45°C
	Relative humidity (non-condensing)	5 ... 95%	5 ... 95%	5 ... 95%
	Protection degree	IP31 - Front panel: IP51	IP31 - Front panel: IP51	IP31 - Front panel: IP65
Mechanical features	**Dimensions**	96.7 x 96.7 x 62.6 mm	96.7 x 96.7 x 62.6 mm	96.7 x 96.7 x 63.4 mm
	Format	96 x 96 mm	96 x 96 mm	96 x 96 mm
	Weight (kg)	0.480	0.480	0.330

ME (additional expansion module)

CVM-C10-MC-485-ICT2	CVM-C10-ITF-IN-485-ICT2	CVM-B100-ITF-485-ICT2	CVM-B150-ITF-485-ICT2
85-265 Vac / 95-300 Vdc	85-265 Vac / 95-300 Vdc	85-265 Vac / 120-300 Vdc	85-265 Vac / 120-300 Vdc
50…60 Hz	50…60 Hz	45…65 Hz	45…65 Hz
3.5…6 VA; 2…6W	3.5…6 VA; 2…6W	6…8 VA; 3…4 W	7…12 VA; 4…7 W
<6 VA ; < 6 W	<6 VA ; < 6 W	< 24 VA ; < 22 W (with expansion modules)	< 28 VA ; < 26 W (with expansion modules)
CAT III (300V)	CAT III (300V)	CAT III (600 V)	CAT III (600 V)
300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) (functional, up to 600 Vac) 520 Vac (p-p) (functional, up to 1000 Vac)	300 Vac (p-n) (functional, up to 600 Vac) 520 Vac (p-p) (functional, up to 1000 Vac)
5…120% (U_n)	5…120% (U_n)	5…200% (U_n)	5…200% (U_n)
…/250 mA (MC)	…/5 A or …/1 A	…/5 A, …/1 A or …/250 mA (MC)	…/5 A, …/1 A or …/250 mA (MC)
1.2 I_n	1.2 I_n	2 I_n	2 I_n
2…120% I_n	0.2…120% I_n	0.2…200% I_n (…/5 A) / 1…200% I_n (…/1 A) 4…200% I_n (.../250 mA)	0.2…200% I_n (…/5 A) / 1…200% I_n (…/1 A) 4…200% I_n (.../250 mA)
-	•	•	•
64	64	128	128
0.5% + 1 digit	0.5% + 1 digit	0.2% + 1 digit / 0.5% + 1 digit (V_n)	0.2% + 1 digit / 0.5% + 1 digit (V_n)
0.5% + 1 digit	0.5% + 1 digit	0.2% + 1 digit / 1% + 1 digit ($I_{neutral}$)	0.2% + 1 digit / 1% + 1 digit ($I_{neutral}$)
1% + 2 digits	0.5% + 2 digits	0.5% + 1 digit	0.5% + 1 digit
2% + 2 digits	1% + 2 digits	1% + 1 digit	1% + 1 digit
1% (Class 1)	1% (Class 1)	0.5% (Class 0.5S) for …/5 A 1% (Class 1) for …/1 A or …/250 mA	0.5% (Class 0.5S) for …/5 A 1% (Class 1) for …/1 A or …/250 mA
2% (Class 2)	2% (Class 2)	1% (Class 1) for …/5 A 2% (Class 2) for …/1 A or …/250 mA	1% (Class 1) for …/5 A 2% (Class 2) for …/1 A or …/250 mA
2	-	2	2
24 Vdc	-	48 Vdc	48 Vdc
50 mA	-	130 mA	130 mA
Configurable	-	Configurable	Configurable
2	2	2	2
250 Vac	250 Vac	250 Vac	250 Vac
6 A	6 A	6 A	6 A
1500 VA (250 Vac / 5 A)	1500 VA (250 Vac / 5 A)	1500 VA (250 Vac / 5 A)	1500 VA (250 Vac / 5 A)
Optoisolated	Optoisolated	Optoisolated	Optoisolated
2	2	2	2
•	•	•	•
4	4	4	4
•	•	•	•
31	31	50	50
•	•	•	•
•	•	•	•
3	3	3	3
•	•	•	•
•	•	•	•
•	•	•	•
Custom COG LCD	Custom COG LCD	TFT colour screen	TFT colour screen
Capacitive	Capacitive	Capacitive	Capacitive
•	•	•	•
-	-	• (ME)	• (ME)
•	•	•	•
-	-	• (ME)	• (ME)
-	-	•	•
-	-	• (ME)	• (ME)
-	-	• (ME)	• (ME)
-	-	Yes	Yes
•	•	•	•
•	•	•	•
-5ºC... +45ºC	-5ºC... +45ºC	-10ºC ... +50ºC	-10ºC ... +50ºC
5 ... 95%	5 ... 95%	5 ... 95%	5 ... 95%
IP31 - Front panel: IP65	IP31 - Front panel: IP65	IP30 - Front panel: IP65	IP30 - Front panel: IP65
96.7 x 96.7 x 63.4 mm	96.7 x 96.7 x 63.4 mm	98.7 x 97 x 110.50 mm	144.7 x 144.7 x 110.50 mm
96 x 96 mm	96 x 96 mm	96 x 96 mm	144 x 144 mm
0.330	0.330	0.500	0.695

Comparison table
Assembly on DIN Rail




		CVM 1D-C C VM 1D-RS485-C (*1)	CVM 1D-C MID CVM 1D-RS485-C MID (*1)	CVM NET-ITF-RS485-C2	CVM NET-MC-ITF-RS485-C2
Power circuit	**Power supply voltage**	88-276 Vac	88-276 Vac	230 Vac 85…265 Vac / 95…300 Vdc (Plus Version)	230 Vac 85…265 Vac / 95…300 Vdc (Plus Version)
	Installation category	CAT III (300V)	CAT III (300V)	CAT III (300V)	CAT III (300V)
Voltage measurement circuit	**Voltage**	110…230 Vac	230 Vac	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)
	Voltage measurement margin	80…120 % (U_n)	80…120 % (U_n)	4…100 % (U_n)	4…100 % (U_n)
	Frequency	50...60 Hz	50 Hz	45...65 Hz	45...65 Hz
Current measurement circuit	**Nominal current**	5 A	5 A	…/5A	…/250 mA (MC)
	Maximum current	32 A	32 A	1.2 I_n	1.2 I_n
	Current measurement margin	0.5…120% I_n	0.5…120% I_n	0.2…120% I_n	0.2…120% I_n
	Neutral current	-	-	-	-
Sampling	**Samples/cycle**	16	16	32	32
Accuracy	**Voltage**	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit
	Current	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit
	Active power	1% + 1 digit	1% + 1 digit	1% + 1 digit	1% + 1 digit
	Reactive power	1% + 1 digit	1% + 1 digit	1% + 1 digit	1% + 1 digit
	Active energy	1% (Class 1)	1% (Class B)	1% (Class 1)	1% (Class 1)
	Reactive energy	2% (Class 2)	2% (Class 2)	1% (Class 1)	1% (Class 1)
Digital transistor outputs	**Quantity**	1	1	2	2
	Maximum voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
	Maximum current	50 mA	50 mA	50 mA	50 mA
Parameters	**V, A, W, Wh, var, cos φ**	•	•	•	•
	Quadrants	4	4	4	4
	THD	-	-	•	•
	Harmonics	-	-	-	-
	Parameters, per phase	•	•	•	•
	Maximum demand	•	•	•	•
	Tariffs	-	-	1	1
	Hours, cost, kgCO_2	-	-	-	-
	Single-phase measurement	•	•	•	-
	Three-phase measuring	-	-	•	•
Front panel	**Display**	6-digit LCD	6-digit LCD	-	-
	Buttons	Plastic button V0	Plastic button V0	Communications	Communications
Communications	**RS-485**	(*1)	(*1)	•	•
	TCP/IP	-	-	-	-
Protocols	**Modbus / RTU**	(*1)	(*1)	•	•
	Modbus / TCP	-	-	-	-
	BACnet	-	-	-	-
	LonWorks	-	-	-	-
	Mbus	-	-	-	-
Standards	**Designed according to UL**	-	-	-	-
	Designed according to MID	-	•	-	-
Environmental features	**Operating temperature**	-5°C... +45°C	-5°C... +45°C	-10°C ... +50°C	-10°C ... +50°C
	Relative humidity (non-condensing)	5 ... 95%	5 ... 95%	5 ... 95%	5 ... 95%
	Protection degree	IP20 - Front panel: IP31	IP20 - Front panel: IP51	IP31 - Front panel: IP51	IP31 - Front panel: IP51
Mechanical features	**Dimensions**	90 x 17.5 x 71.6 mm	90 x 17.5 x 71.6 mm	85 x 52 x 70 mm	85 x 52 x 70 mm
	Format	1 module	1 module	3 modules	3 modules
	Weight (kg)	0.150	0.150	0.210	0.210

					
CVM MINI	**CVM MINI-ITF-C2**	**CVM MINI-MC-ITF-C2**	**CVM MINI-ITF-RS485-C2 (*1)** **CVM MINI-ITF-HAR-RS485-C2 (*2)** **CVM MINI-ITF-ETHERNET-C2 (*3)** **CVM MINI-ITF-BACnet-C2 (*4)** **CVM MINI-ITF-LonWorks-C2 (*5)**	**CVM MINI-MC-ITF-RS485-C2**	**CVM NET4-MC-ITF-RS485-C4**
230 Vac 85…265 Vac / 95…300 Vdc (Plus Version)	230 Vac 85…265 Vac / 95…300 Vdc (Plus Version)	230 Vac 85…265 Vac / 95…300 Vdc (Plus Version)	230 Vac 85…265 Vac / 95…300 Vdc (Plus Version)	230 Vac 85…265 Vac / 95…300 Vdc (Plus Version)	85…265 Vac / 95…300 Vdc
CAT III (300V)	CAT III (300V)	CAT III (300V)	CAT III (300V)	CAT III (300V)	CAT III (300V)
300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)	300 Vac (p-n) 520 Vac (p-p)
4…100 % (U_n)	4…100 % (U_n)	4…100 % (U_n)	4…100 % (U_n)	4…100 % (U_n)	4…100 % (U_n)
45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz	45...65 Hz
…/5A or …/1A	…/5A or …/1A	…/250 mA (MC)	…/5A or …/1A	…/250 mA (MC)	…/250 mA (MC)
1.2 I_n	1.2 I_n	1.2 I_n	1.2 I_n	1.2 I_n	1.3 I_n
2…120% I_n	0.2…120% I_n	0.2…120% I_n	0.2…120% I_n	0.2…120% I_n	1.2…105% I_n
-	-	-	-	-	-
32	32	32	32	32	32
0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit
0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit
0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	1% + 1 digit
0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	1% + 1 digit
0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	1% (Class 1)
0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	0.5% + 1 digit	1% (Class 1)
-	2	2	2	2	4
-	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
-	50 mA	50 mA	50 mA	50 mA	50 mA
•	•	•	•	•	•
4	4	4	4	4	4
•	•	•	•	•	•
-	-	-	15 (*2)	-	15
•	•	•	•	•	•
•	•	•	•	•	•
1	1	1	1	1	1
-	-	-	-	-	-
•	•	-	•	-	-
•	•	•	•	•	•
Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	-
Silicone Button	Silicone Button	Silicone Button	Silicone Button	Silicone Button	Communications
-	-	-	(*1), (*2)	•	•
-	-	-	(*3)	-	-
-	-	-	(*1), (*2)	•	•
-	-	-	(*3)	-	-
-	-	-	(*4)	-	-
-	-	-	(*5)	-	-
-	-	-	-	-	-
•	•	•	•	•	-
-	-	-	-	-	-
-10°C ... +50°C	-10°C ... +50°C	-10°C ... +50°C	-10°C ... +50°C	-10°C ... +50°C	-10°C ... +50°C
5 ... 95%	5 ... 95%	5 ... 95%	5 ... 95%	5 ... 95%	5 ... 95%
IP31 - Front panel: IP51	IP31 - Front panel: IP51	IP31 - Front panel: IP51	IP31 - Front panel: IP51	IP31 - Front panel: IP51	IP31 - Front panel: IP51
85 x 52 x 70 mm	85 x 52 x 70 mm	85 x 52 x 70 mm	85 x 52 x 70 mm	85 x 52 x 70 mm	105 x 70 x 90 mm
3 modules	3 modules	3 modules	3 modules	3 modules	6 modules
0.210	0.210	0.210	0.210	0.210	0.250

CVM-C5

Panel mounted multifunction multimeter

Description

The **CVM-C5** is a panel mounted (96 x 96 mm) multimeter that records energy values. Compact and intuitive, with 4-quadrant measurement (Consumption and Generation). The **CVM C5** is suitable for Low Voltage installations, in both 3 and 4-wire three-phase circuits, two-phase circuits with or without neutral, single-phase circuits or ARON connections.

Display features and interface:

- Quick display of parameters with a single button
- Clearly displays the basic parameters of the installation
- Displays the electricity consumption value according to the cost per kWh
- kgCO2 consumption/generation indicator or according to the energy source.
- Backlit LCD screen

Other features

- Measurement with **CIRCUTOR's MC** efficient current transformers or /5 A or /1 A transformers.
- 1 digital output (S0 interface)
- 1 digital input (tariff or energy source selection)
- Maximum and minimum values
- Maximum demand.

Applications

- Recording and displaying the consumption of energy from two different sources (network/generator set).
- Generation of an impulse signal associated with the cost, $kgCO_2$ emissions or savings, according to the consumption or generation of energy.
- Generation of alarms with a transistor output; configurable parameters: Low/High, hysteresis (%), NO/NC, connection/disconnection delay and interlocking.

Technical features

Power circuit	Power supply voltage	85-265 Vac / 50...60 Hz 95-300 Vdc
Measurement circuit	Voltage	300 Vac p-n / 520 Vac p-p
	Frequency	45 ... 65 Hz
	Current	.../5 A or .../1 A **MC**: .../250 mA
	Sampling	32 samples/cycle
Accuracy class	V, I	0.5%
	Power / Energy	1%
Output	1 digital output	S0 interface Configurable, up to 1,000 impulses per kW·h, kvar·h, etc. (24 Vdc max., 50 mA, 5 imp/s, Configurable Max. Ton/Toff)
Input	1 digital input	Tariff selection, NPN, optocoupled
Build features	Enclosure	VO self-extinguishing plastic
	IP protection degree	Front panel: IP 51 Rear: IP 31
	Dimensions	96.7 x 96.7 x 62.60 mm
Environmental conditions	Operating temperature	-10...+50 °C
	Relative humidity	5 ... 95%
	Maximum altitude	2000 m
Safety	Class III according to **EN 61010** Double-insulated electric shock protection, Class II	
Standards	**IEC 664, VDE 0110, UL 94, IEC 801, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1, CE,** in accordance with **UL**	

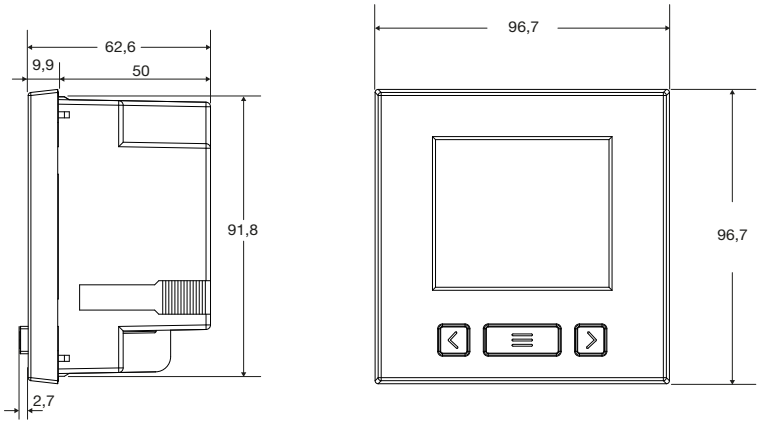
CVM-C5

Panel mounted multifunction multimeter

References

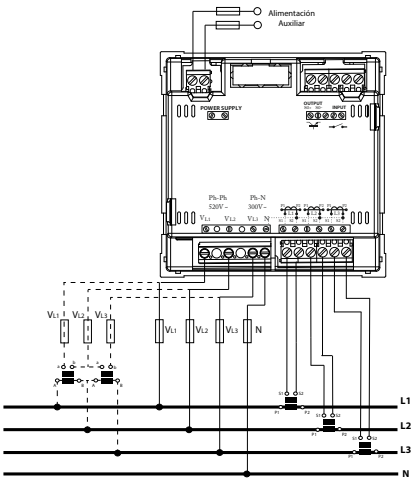
Current input	Input	Output	Type	Code
.../5 A or .../1 A	1	1	**CVM-C5-IC**	**M55803**
.../250 mA	1	1	**CVM-C5-MC-IC**	**M55823**

Dimensions

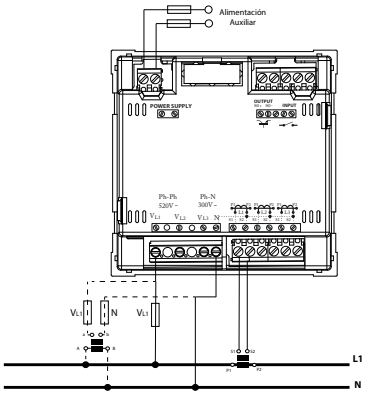


Connections

Three-phase + neutral connection
with or without voltage transformers



Single-phase connection
with or without voltage transformers



CVM-C10

Panel mounted power analyzer

Description

The **CVM-C10** is a panel mounted (96x96 mm) power analyzer that records energy values. Compact and versatile, with 4-quadrant measurement (consumption and generation). Suitable for Medium or Low voltage installations, in both 3 or 4-wire three-phase circuits, two-phase circuits with or without neutral, single-phase circuits or ARON connections.

Display features and interface:

- Backlit touch-screen (capacitive)
- Analogue display of instantaneous parameters (power, maximum power reached and cos φ or PF)
- Backlit display
- Alarm LED indicator

Applications

- Record the energy consumption from three different sources: network, generator set or photovoltaic energy generation system.
- Generation of an impulse signal associated with the cost, kgCO_2 emissions or savings, according to the consumption or generation of energy.
- Selection of tariffs with digital inputs. Perfect to calculate costs in three different work shifts.
- Programs alarms on any instantaneous parameter measured or calculated. Configurable parameters: Low/High, hysteresis (%), NO/NC, connection/disconnection delay and interlocking.

Technical features

Power circuit	Power supply voltage	85...265 Vac / 95...300 Vdc
Measurement circuit	Voltage	300 V AC p-n / 520 V AC p-p
	Frequency	50...60 Hz
	Current	**ITF** ... /5 A or .../1 A **MC** .../250 mA
	Sampling	64 samples/cycle
Accuracy class	V, I, Power	0.5%
	Active Energy	1% (Class 1)
	Reactive Energy	2% (Class 2)
Display of harmonics, up to the	V, A	31st
Communications	Protocol	RS-485 Modbus/RTU
	Speed	9600, 19200, 38400
	Bit, parity, stop	8, n, 1
Outputs	2 digital outputs	OS Interface Configurable, up to 1000 impulses 2 NPN Transistors (Only in version 3 TS) (24 Vdc max, 50 mA, 5 imp/s, Max T_{on}/T_{off} configurable)
	2 relay outputs	Max. / Min / NO/NC / Hysteresis / Interlocking 250 Vac, 6 A
Inputs	2 digital inputs	Tariff selection or external alarms NPN, optocoupled
Build features	Enclosure	VO self-extinguishing plastic
	Protection Degree	Front panel: IP 64 Rear: IP 31
	Dimensions	96.7 x 96.7 x 63.4 mm
Environmental conditions	Operating temperature	-10...+50 °C
	Relative humidity	5 ... 95%
	Maximum altitude	2000 m
Safety	Class III according to **EN 61010** Double-insulated electric shock protection, Class II	
Standards	**IEC 61000**, **IEC 61000-4-3**, **IEC 610004-11**, **IEC 61000-4-4**, **IEC 610004-5**, Measurement according to **MID,** in accordance with **UL**	

CVM-C10

Panel mounted power analyzer

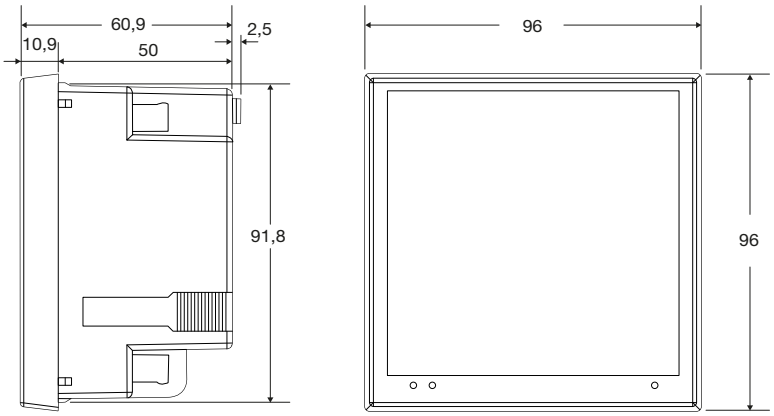
Other features

— Modbus RS-485 serial communications
— 2 transistor outputs, configurable for impulses or alarms
— 2 relay outputs, configurable for alarms
— 2 digital inputs for selecting three tariffs or detecting logical states
— Allows for tariff selection through communications
— Precision class 0.5 in voltage and current; 1 in power and energy

References

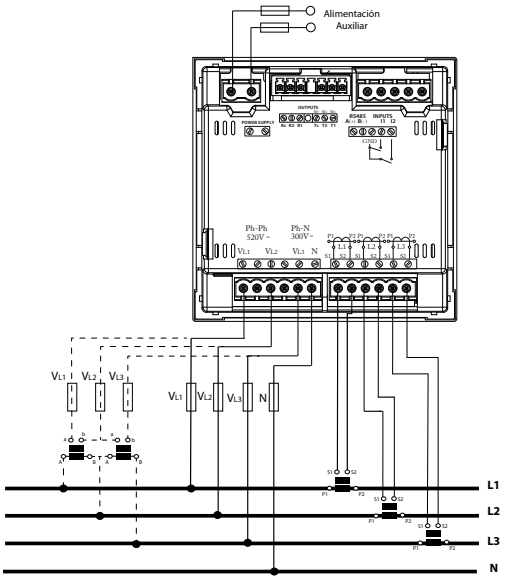
Transistor output	Current measurement channels	Current input	Type	Code
2	3	/5 or /1 A	**CVM-C10-ITF-485-ICT2**	**M55911**
2	3	/250 mA	**CVM-C10-MC-485-ICT2**	**M55921**
-	4	/5 or /1 A	**CVM-C10-ITF-IN-485-IC2**	**M55942**

Dimensions

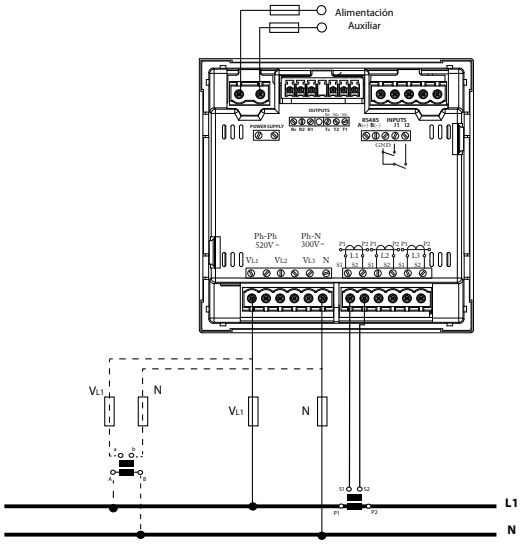


Connections

Three-phase + neutral connection
with or without voltage transformers



Single-phase connection
with or without voltage transformers



CVM-B100
CVM-B150

Panel mounted power analyzers

Description

The **CVM-B100** and **CVM-B150** units are panel mounted three-phase power analyzers (dimensions: 96x96 and 144x144 mm, respectively). Both offer 4-quadrant measurement (consumption and generation). Suitable for Medium or Low voltage installations, in both 3 or 4-wire three-phase circuits, two-phase circuits with or without neutral, single-phase circuits or ARON connections.

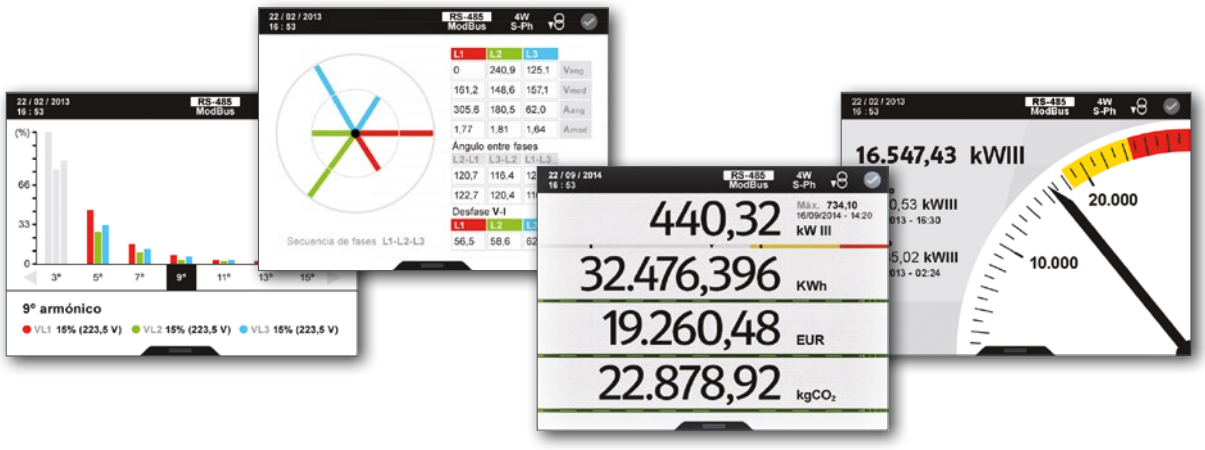
The **CVM-B100** and **CVM-B150** high-performance units feature a measurement engine that allows the user to analyse many different electrical parameters, in addition to offering a large variety of optional expansion modules for the same unit.

Features:

- Format: 96x96 (CVM B100) and 144x144 (CVM B150)
- High-resolution VGA colour screen
- IP65 front panel protection
- 5 voltage inputs (3 phases + neutral + earth)
- 4 Current inputs, ITF
- Class 0.2 voltage and current accuracy
- Class 0.5S energy accuracy
- Expandable unit, up to 4 modules, combining digital and analogue outputs, Mbus/TCP, XML
- Modular (optional addition of expansion modules)
- Touch-sensitive movement buttons
- Universal power supply source
- RS485 communications port (MODBUS/RTU and BACnet protocols)
- Customisation of parameters to be displayed

Other features

- Innovative SCV interface (Slide, Choose & View) for versatile data display, enabling the customisation of the parameters displayed on the screen
- Electrical parameters: instantaneous, maximum, minimum and demand
- Incremental electrical parameters (energy), times, costs, emissions
- 3 Tariffs (can be selected via the digital input or RS485 communications)
- Capable of showing costs and $KgCO_2$ emission sources on the screen, depending on the energy consumed or generated
- 2 Relay outputs for alarms with delay, times, ON and OFF, etc.
- 2 transistor outputs for alarms or impulse generation, with all the possible configuration parameters
- 2 digital inputs, with control over the selection of the unit's tariffs or configurable for monitoring purposes, with RS-485 Modbus communications, monitoring of logical states of other electromechanical units. (RCCBs, thermal-magnetic circuit breakers, etc.)



CVM-B100
CVM-B150

Panel mounted power analyzers

Applications

— Control and monitoring of all electrical parameters measured in any electric distribution panel and low and high-voltage connection points.

— 4 alarms (2 per transistor and 2 per relay), fully and independently programmable: low or high value, hysteresis, connection/disconnection delays, normally open or closed standby status and interlocking.

— Generation of impulses with transistor outputs, fully and independently configurable over any incremental parameter (energy, costs, $kgCO_2$, total meter or tariff hours)

— Transducer that converts analogue signals to any instantaneous parameter that the unit can measure or calculate, with built-in expansion modules with analogue outputs.

— Display of process signals, with a built-in expansion module with analogue inputs; optional reporting of these signals to SCADA systems through communication systems

— Control of electrical load or alarm signal operations by programming the transistor or relay outputs that are built-in or added through expansion modules.

— Autonomous datalogger with web server, connected to an EDS unit. Enables direct monitoring of the historical data stored in the unit via a conventional web browser.

Technical features

Power circuit	Power supply voltage	94...265 Vac / 120...300 Vdc
	AC Frequency	45...65 Hz
	AC Consumption	**CVM-B100 -** 6...8 VA (max. 24 VA) **CVM-B150 -** 7...12 VA (max. 28 VA)
	DC consumption	**CVM-B100 -** 3...4 W (max. 22 W) **CVM-B150 -** 4...7 W (max. 26 W)
Voltage measurement circuit	Voltage range	20...300 V (functional, up to 600 V p-n / 1000 V p-p)
	Frequency	40...70 Hz
	Measurement margin	25 %...200% of the U_n for U_n=300 Vac (p-n)
	Admissible overvoltage	750 Vac
	Maximum consumption (limited current)	< 0.1 VA
Current measurement circuit	Current measurement	4 (3 phases + 1 neutral)
	Input current	.../5 A or.../1 A or .../250 mA
	Minimum current for class	250 mA
	Start-up current	10 mA (0.4 mA with **MC** transformers)
	Measurement margin	0.010 .. 10 A
	Admissible overload	10 A permanent, 100 A t < 1 s
	Consumption	< 0.15 VA
Maximum transformation ratios	Primary V : 6,000,000 (phase-neutral) Primary A : 10,000 Product of Primary V x Primary A <60,000,000,000	
Maximum meter value (total)	Yes (Primary A / Secondary A) < 1,000 (2 GW)	
	Yes (Primary A / Secondary A) ≥ 1,000 (2 TW)	
Accuracy class	Voltage	0.2%
	Current	0.2%
	Neutral current	0.5%
	Power	0.5% ± 1 digit
	Active energy	Class 0.5 S
	Reactive energy	Class 2
Display of harmonics	Voltage/ Current	up to 50

CVM-B100
CVM-B150

Panel mounted power analyzers

Technical features

Connections		
Digital inputs	Selection of tariffs, states or external alarms	
	Type	Optoisolated potential-free contact
	Quantity	2
	Activation current	4 mA (12 V maximum voltage of open contact)
	Insulation	4 kW
Digital outputs	Generation of impulses or alarms	
	Type	NPN transistor
	Quantity	2
	Maximum operating voltage	+/- 48 Vdc
	Maximum operation current	+/- 130 mA
	Maximum frequency	1000 impulses / second
	Pulse duration (T on / T off)	0.3 / 0.7 ms (1 ms of a complete impulse)
	Alarms	
	Type	Relay
	Quantity	2
	Maximum operating power	1500 VA / 180 W
	Maximum operating voltage	400 Vac
	Maximum switching current	6 A
	Electrical working life (400 V / 6 A)	3 x 10^4 cycles
	Mechanical working life	1 x 10^7 cycles
Built-in communications	Protocols	Modbus RTU / BACnet
	Speed	9600...115200
	bits, parity, stop	8, n, 1 (configurable)
Environmental conditions	Operating temperature	-10...+50°C
	Relative humidity	5...95%
	Altitude	2000 m
Build features	Format	Assembly on 96x96mm or 144x144 panel
	Depth	110 mm w/o expansion modules (both models)
	Front panel IP Protection	IP65
	Rear panel IP protection	IP30
Safety	Designed for CAT III 300/520 Vac installations, in accordance with EN 61010 Double-insulated electric shock protection, class II	
Standards	IEC 62053-22, ANSI (class 0.5S), IEC 62053-23 ANSI C12.1 (class 2), IEC 61010, IEC 61000, UNE-EN 55022. Measurement in accordance with MID, design in accordance with UL IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-11, IEC 61000-4-4, IEC 61000-4-5	

References

96 x 96

Current measuring secondaries	Type	Code
.../5 or .../1 A or ...250 mA	CVM-B100-ITF-RS485-ICT2	**M56011**

144 x 144

Current measuring secondaries	Type	Code
.../5 or .../1 A or ...250 mA	CVM-B150-ITF-RS485-ICT2	**M56111**

CVM-B100
CVM-B150

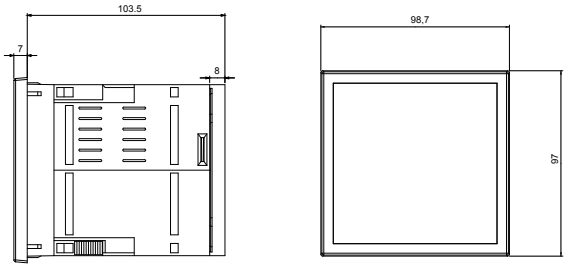
Panel mounted power analyzers

Expansion modules for CVM B150 and CVM B100

Outputs	Digital Inp.	Analogue Inp.	Protocol	Communications	Type	Code
8 Trans.(*)	8	-	-	-	**M-CVM-AB-8I-8OTR**	**M56E01**
8 relays	8	-	-	-	**M-CVM-AB-8I-8OR**	**M56E02**
8 (0/4...20 mA)	-	4 (0/4...20 mA)	-	-	**M-CVM-AB-4AI-8AO**	**M56E03**
-	-	-	Ethernet	Modbus / TCP	**M-CVM-AB-Modbus-TCP**	**M56E05**
			LonWorks	LonTalk ISO/IEC 14908 ANSI/EIA 7091	**M-CVM-AB-LonWorks**	**M56E08**
-	-	-	-	Profibus/DP	**M-CVM-AB-Profibus**	**M56E09**

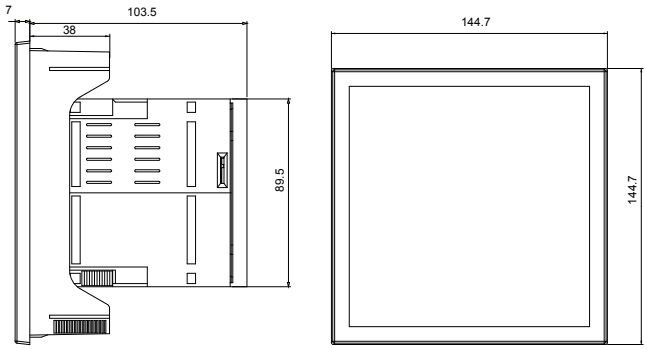
Dimensions

CVM B100



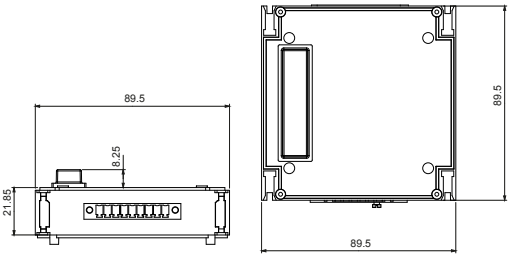
Window level: 92x92 mm

CVM B150



Window level: 138x138 mm

CVM-B Module



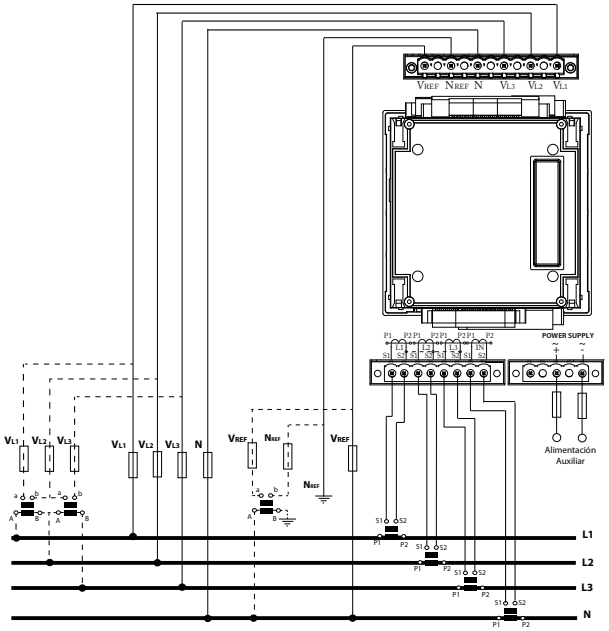
Note: Refer to the product manual for other options

CVM-B100
CVM-B150

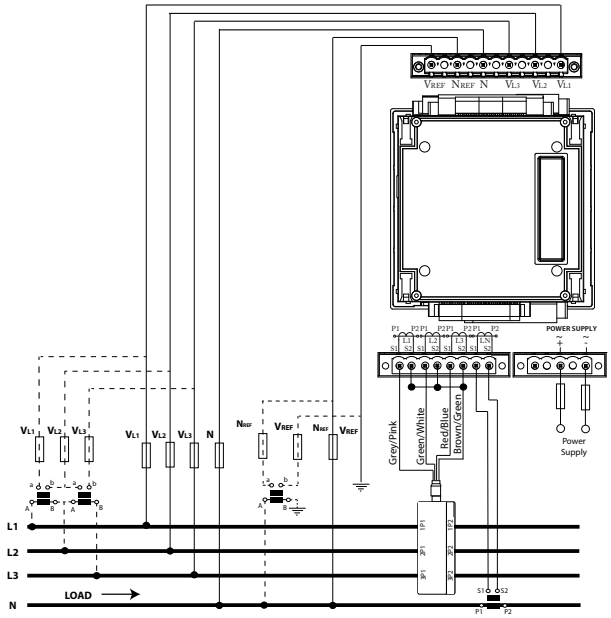
Panel mounted power analyzers

Connections

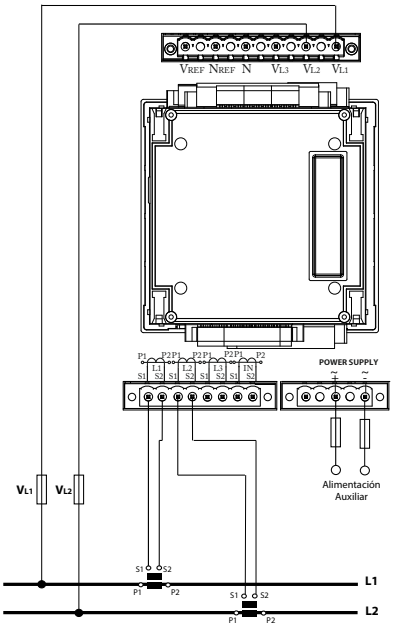
Three-phase measuring, with or without voltage transformer and current transformers



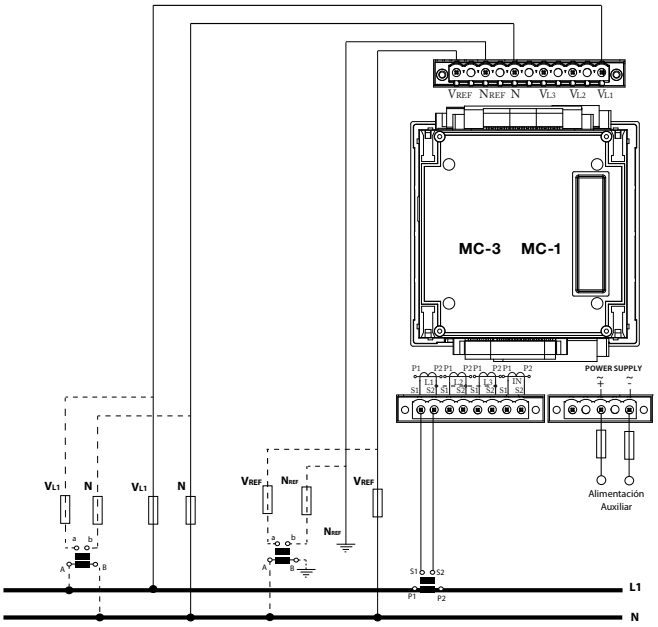
Three-phase measuring, with or without voltage transformer and MC-3 type transformers (1250 mA) + MC1 for neutral current



Direct phase-phase measurement with current transformers



Measurement in single-phase system with or without voltage transformer



Note: Refer to the product manual for other options

CVM-1D

Single-phase power analyzer, DIN rail

Description

CVM-1D is a power analyzer for single-phase circuits up to 32 A. It features an LCD display with a rotating screen system, showing a total of 24 instantaneous, maximum and minimum, electrical variables. It has been designed in an enclosure with only 1 DIN module (18 mm). The compact size of the analyzer allows it to be installed on any electric panel. The unit has the Modbus/RTU (RS-485) protocol and is compatible with the **PowerStudio energy management software.**

Its main features are:

- Six-digit LCD display
- RS-485 Modbus/RTU communication
- Programmable alarm or impulse output
- Measurement in four quadrants

Applications

- Student residences / Hotels
- Marinas
- Shopping centres
- Buildings with rented office space
- Campgrounds
- Domestic and industrial lines
- Single-phase lines in general

Technical features

Power circuit	Single-phase power supply	88...276 Vac
	Power supply frequency	50 / 60 Hz
	Power supply use	2 V·A
Measurement circuit	Phase – Neutral rated voltage	110...230 Vac (±20%)
	Frequency	50 / 60 Hz
	Nominal current	5 A
	Minimum current	250 mA
	Maximum current	32 A
Accuracy class	Voltage, Current	0.5% + 1 digit
	Active power, Reactive power	1% + 1 digit
	Active Energy	Class 1 or B (**IEC 62053-21** or **EN 50470**)
	Reactive Energy	Class 2 (**IEC 62053-23**)
Output transistor features	Type	Optoisolated transistor (collector open) NPN
	Maximum operating voltage	42 Vdc
	Maximum operating current	50 mA
	Maximum frequency	1000 imp/kWh
	Impulse duration	4...100 ms (configurable)
	Insulation	3.7 kV_{RMS} / 1 min
Communications	Port	RS-485
	Protocol	Modbus / RTU
Build features	Measurement module	Assembly on DIN 46277 rail (**EN 50022**)
	Number of modules	1
Environmental conditions	Operating temperature	-5 ... +45 °C
	Protection degree	IP31 (IP50 MID model)
	Humidity (non-condensing)	5 ... 95% (non-condensing)
	Maximum altitude	2000 m
Safety	**EN 61010** Double-insulated electric shock protection, class II	
Standards	**IEC 664, VDE 0110, UL94-V0, EC 801, IEC 348, IEC 571-1, Class B EN 50470-3 in Active Energy, Class 2 EN 62053-23 in Reactive Energy, EN 50470-1, EN 61010, EN 61000-4-3, EN 61000-4-4, EN 61000-6-4, EN 55022**	

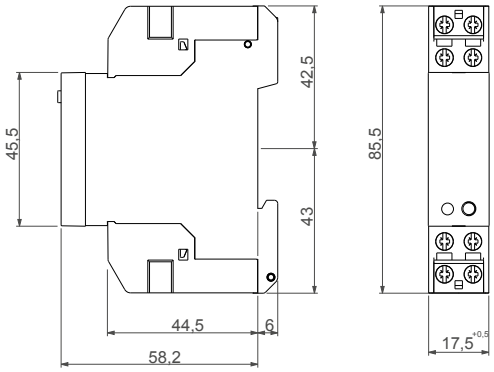
CVM-1D

Single-phase power analyzer, DIN rail

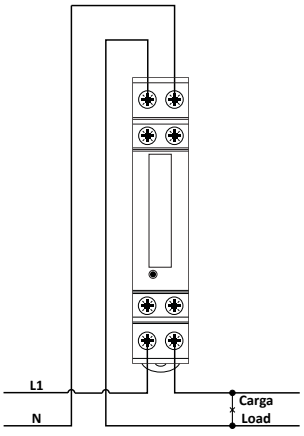
References

Type	Code	Nominal current	Protocol	Communications
CVM 1D-C	M55510	250 mA...32 A	-	-
CVM 1D-RS485-C	M55511	250 mA...32 A	Modbus / RTU	RS-485
CVM 1D-C MID	M555M0	250 mA...32 A	-	-
CVM 1D RS485 C MID	M555M1	250 mA...32 A	Modbus / RTU	RS-485

Dimensions



Connections



CVM NET

Three-phase power analyzer (balanced and unbalanced), assembly on DIN rail - w/o display

Description

CVM NET is a Power Analyzer for measuring balanced or unbalanced single and three-phase networks. It has been specifically designed for measuring up to 230 electrical parameters and for transmitting this data through the RS-485 communication bus with the Modbus/RTU protocol to the supervision SCADA.

Its main features are:

- DIN rail format of only 3 modules
- Mounted on 72 x 72 mm panel, with adapter front panel
- Measures the current with ... / 5 A and .../250 mA external transformers (**MC** model)
- Possibility of measuring Medium and Low Voltage networks
- RS-485 communication (Modbus RTU)
- Compatible with **PowerStudio** / **PSS** / **PSSDeluxe** software
- 2 programmable digital outputs
- Universal power supply. Universal power supply for the Plus model
- Sealable

Applications

- Control application on switchboards and low and medium voltage connection points, where an analyzer must be installed on a DIN rail due to space restrictions.
- Alarm control. Maximum value, minimum value and programmable delay.
- Control of active or reactive energy using the impulse output
- Instantaneous data capture, maximum and minimum values of the electrical parameters measured.

Technical features

Power circuit	Rated voltage	230 Vac
	Power supply frequency	50 - 60 Hz
	Maximum power consumption	3 VA
Measurement circuit	Rated voltage	300 Vac / 520 Vac
	Frequency	40...65 Hz
	Nominal current	I_n / 5 A or / 250 mA
	Permanent overload	1.2 I_n
Accuracy class	Voltage, Current	0.5% + 1 digit
	Active power, Reactive power	1% + 1 digit
	Active energy Reactive energy	1% (Class 1)
Communications	Protocol	RS-485
	Communications protocol	Modbus / RTU
	Speed	1200 / 2400 / 4800 / 9600 / 19200 bps
	Length	8
	Parity	No parity / even / odd
	Bits of parity	1 / 2
Output transistors	Type: Isolated transistor	Open NPN collector
	Maximum operating voltage	24 Vdc
	Maximum operating current	50 mA
	Maximum frequency	5 imp/s
	Impulse duration	100 ms
Build features	Measurement module	DIN Rail 46277 (**EN 50022**)
	Number of modules	3
Environmental conditions	Operating temperature	-10 °C...+50 °C
	Protection degree	Embedded unit: IP51 Terminals: IP31
	Humidity (without condensation)	5 ... 95% (non-condensing)
	Maximum altitude	2000 m
Safety	**EN 61010** Double-insulated electric shock protection, class II	
Standards	**IEC 664, VDE 0110, UL 94, IEC 801, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1, EN 61000-4-11, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN-61000-4-5, EN 55011, CE**	

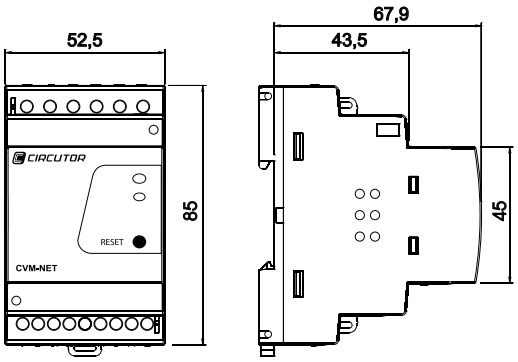
CVM NET

Three-phase power analyzer (balanced and unbalanced), assembly on DIN rail - w/o display

References

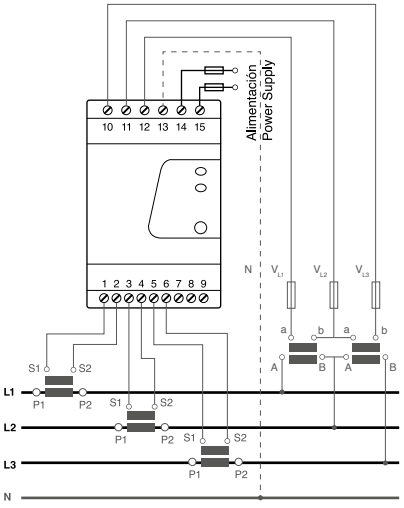
Quadrants	Communications	Protocol	Digital output	Measurement	Transformer type	Type	Code
4	RS-485	Modbus / RTU	2	3 phases	... / 5 A	**CVM NET-ITF-RS485-C2**	**M54B21**
4	RS-485	Modbus / RTU	2	3 phases	.../250 mA (type **MC**)	**CVM NET-ITF-MC-RS485-C2**	**M54B31**

Dimensions

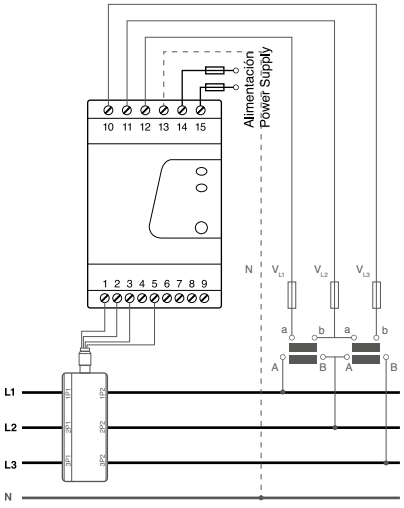


Connections

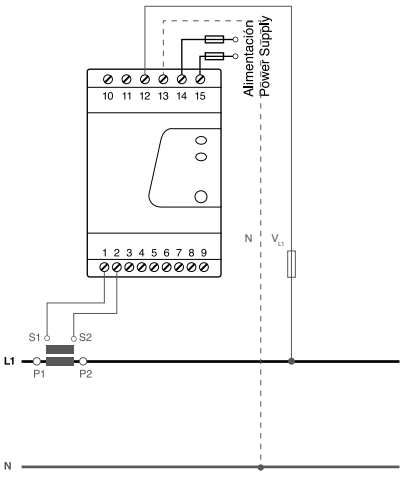
Three-phase + neutral connection
3 voltage transf. + 3 current transf.



Three-phase + neutral connection
MC efficient transformer



Single-phase connection



CVM MINI

Three-phase power analyzer (balanced and unbalanced) for DIN rails

Description

Three-phase power analyzer (balanced and unbalanced), assembly on DIN rail, with a very compact size, and 4-quadrant measurement.

Other features include:

- Current measurement .../5 or .../1 A or .../250 mA
- DIN rail format of only 3 modules
- Assembly on 72 x 72 mm panel with adapter front panel (**M5ZZF1**)
- RS-485 Communications (Modbus-RTU)
- It features two transistor outputs (programmable)
- With ITF technology: galvanic insulation protection, depending on the type
- Selection of parameters to display
- Selection of the default page
- Universal power supply for the Plus model
- Sealable

Applications

- Control application on switchboards and low and medium voltage connection points, where an analyzer must be installed on a DIN rail due to space restrictions.
- Alarm control. Maximum value, minimum value and programmable delay.
- Control of active or reactive energy using the impulse output.
- Instantaneous data capture, maximum and minimum values of the electrical parameters measured.

Technical features

Power circuit	Standard Optional	230 Vac (-15...+10%) 85...265 Vac / 95...300 Vdc / 20...120 Vdc
	Consumption	3 V·A
	Frequency	50...60 Hz
Measurement circuit	Rated voltage	300 Vac (p-n) / 520 Vac (p-p)
	Frequency	45...65 Hz
	Voltage circuit consumption	0.7 V·A
	Current circuit consumption	ITF 0.9 VA/ Shunt 0.75 VA
	Transformers	.../5 A or.../1 A or .../250 mA
	Minimum direct current	110 mA
	Maximum direct current	6 A
	Maximum current with transformer	1.2 I_n
Accuracy class	Voltage, Current	0.5% + 1 digit
	Active power, Reactive power	0.5% + 1 digit
	Active energy Reactive energy	0.5% + 1 digit
Environmental conditions	Operating temperature	-10...+50 °C
	Relative humidity	5 ... 95%
	Maximum altitude	2000 m
Optocoupled output transistor (open collector) NPN	Maximum operating voltage	24 Vdc
	Maximum operating current	50 mA
	Maximum frequency of impulses	5 imp/s
	Duration of the impulse	100 ms
Build features	Measurement module	Assembly on DIN 46277 rail (**EN 50022**)
	Protection degree	Embedded unit: IP51 Terminals: IP31
	Dimensions	52.5 x 85 x 67.9 mm (3 modules)
Safety	Designed for CAT III 300/520 Vac installations, in accordance with **EN 61010**. Double-insulated electric shock protection, class II	
Standards	**IEC 664, VDE 0110, UL 94, IEC 801, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1**	

CVM MINI

Three-phase power analyzer (balanced and unbalanced), assembly on DIN rail

References

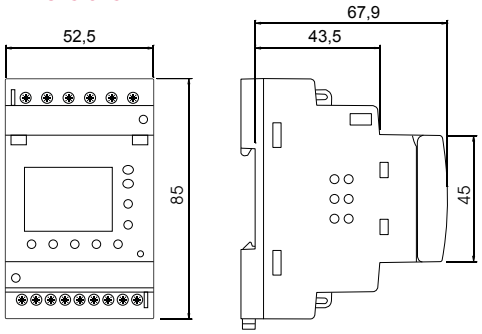
Isolated Inp.	Current Inp.	Digital output	Harmonics	Protocol	Communications	Type	Code
-	.../ 5 A	-	-	-	-	**CVM MINI**	**M52000**
Yes	.../ 5 A	2	-	-	-	**CVM MINI-ITF-C2**	**M52011**
Yes	.../250 mA	2	-	-	-	**CVM MINI-MC-ITF-C2 (*1)**	**M52071**
Yes	.../ 5 A	2	-	Modbus / RTU	RS-485	**CVM MINI-ITF-RS485-C2**	**M52021**
Yes	.../250 mA	2	-	Modbus / RTU	RS-485	**CVM MINI-MC-ITF-RS485-C2 (*1)**	**M52081**
Yes	.../ 5 A	2	U and I (15º)	Modbus / RTU	RS-485	**CVM MINI-ITF-HAR-RS485-C2**	**M52031**
Yes	.../ 5 A	2	-	Modbus / TCP	TCP/IP	**CVM-MINI-ITF-ETHERNET-C2**	**M520J1**
Yes	.../ 5 A	2	-	BACnet	-	**CVM-MINI-ITF-BACnet-C2 (*2)**	**M520F1**
Yes	.../ 5 A	2	-	LonWorks	LonTalk	**CVM MINI-ITF-LonWorks-C2**	**M52091**
				ISO/IEC 14908 – ANSI/EIA 7091			
Panel adapter for CVM-MINI (72 x 72)						**Panel adapter**	**M5ZZF1**

(*1) Requires the installation of MC series efficient transformers. – (*2) Only available with 230 V_{ac} power supply

Coding table

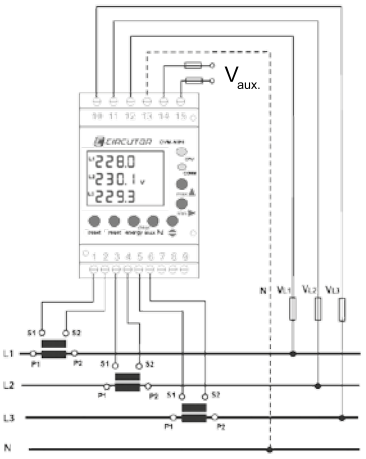
M	5	X	X	X	X	0	0	X
Code						Internal code		↑
Power supply voltage			Standard (230 Vac)					0
			85...285 Vac 95...300 Vdc					C
			20...120 Vdc					5*

Dimensions

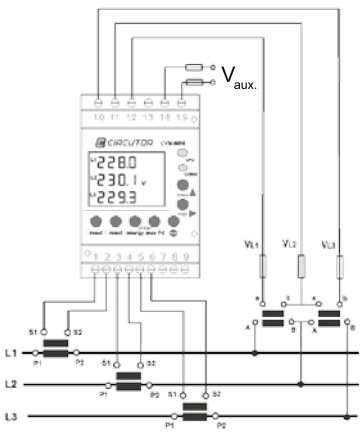


Connections

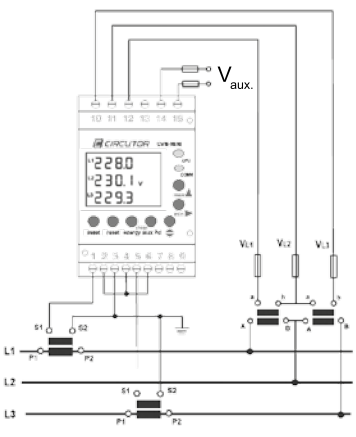
3 or 4 wires (low voltage)



3 wires (2 voltage and 3 current transformers)



3 wires (2 voltage and 2 current transformers)



CVM-NET-4

4 Power analyzers in one, DIN rail

Description

CVM-NET4-MC is a power analyzer that measures balanced and unbalanced three-phase networks. It has been specifically designed to take measurements from 4 different points of the installation, with a single three-phase voltage input but with 4 three-phase channels for current signal inputs, received from the **MC** efficient current transformers. The data acquired by the analyzer is transmitted via the RS-485 communications bus with the Modbus/RTU protocol to the supervision SCADA.

Its main features include:

- DIN rail format with only 6 modules
- Reads 4 three-phase current channels via efficient current transformers of the MC series (.../250 mA)
- RS-485 Communications (Modbus RTU)
- 4 Programmable digital outputs
- Compatible with **PowerStudio** / **PowerStudio SCADA** / **PowerStudio SCADA Deluxe** software.

Applications

- It can take simultaneous measurements from 4 points of the installation. Ideal for assembling on electric panels (compact dimensions: 6 DIN rail modules)
- Control of active and reactive energy via impulses
- Alarm control. Maximum value, minimum value and programmable delay.

Technical features

Power circuit	Rated voltage	85...265 Vac / 95...300 Vdc
	Power supply frequency	50 - 60 Hz
	Maximum power consumption	6 VA
Measurement circuit	Rated voltage	300 Vac / 520 Vac
	Frequency	45...65 Hz
	Nominal current	I_n / 250 mA
	Permanent overload	1.3 I_n
Accuracy class	Voltage, Current	0.5% + 1 digit
	Active power, Reactive power	1% + 1 digit
	Active energy Reactive energy	1% (Class 1)
Communications	Network protocol	RS-485
	Communications protocol	Modbus / RTU
	Speed	1200 / 2400 / 4800 / 9600 / 19200 bps
	Length	8
	Parity	No parity / even / odd
	Bits of parity	1 / 2
Output transistors	Type: Isolated transistor	Open NPN collector
	Maximum operating voltage	24 Vdc
	Maximum operating current	50 mA
	Maximum frequency	5 imp/s
	Impulse duration	100 ms
Build features	Measurement module	DIN Rail 46277 (**EN 50022**)
	Number of modules	6
Environmental conditions	Operating temperature	-10 °C...+50 °C
	Protection degree	IP51
	Humidity (non-condensing)	5 ... 95% (non-condensing)
	Maximum altitude	2000 m
Safety	**EN 61010** Double-insulated electric shock protection, class II	
Standards	**IEC 664, VDE 0110, UL 94, IEC 801, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1, EN 61000-4-11, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN-61000-4-5, EN 55011, CE**	

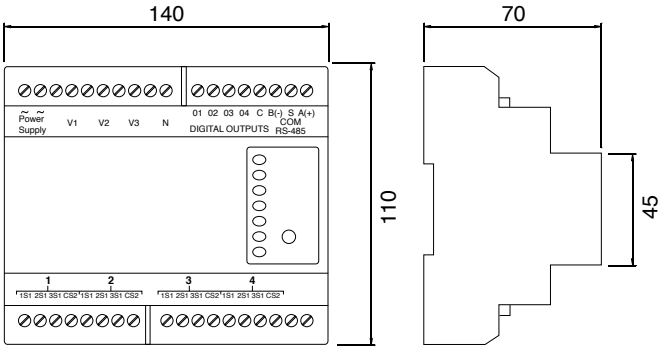
CVM-NET-4

4 Power analyzers in one, DIN rail

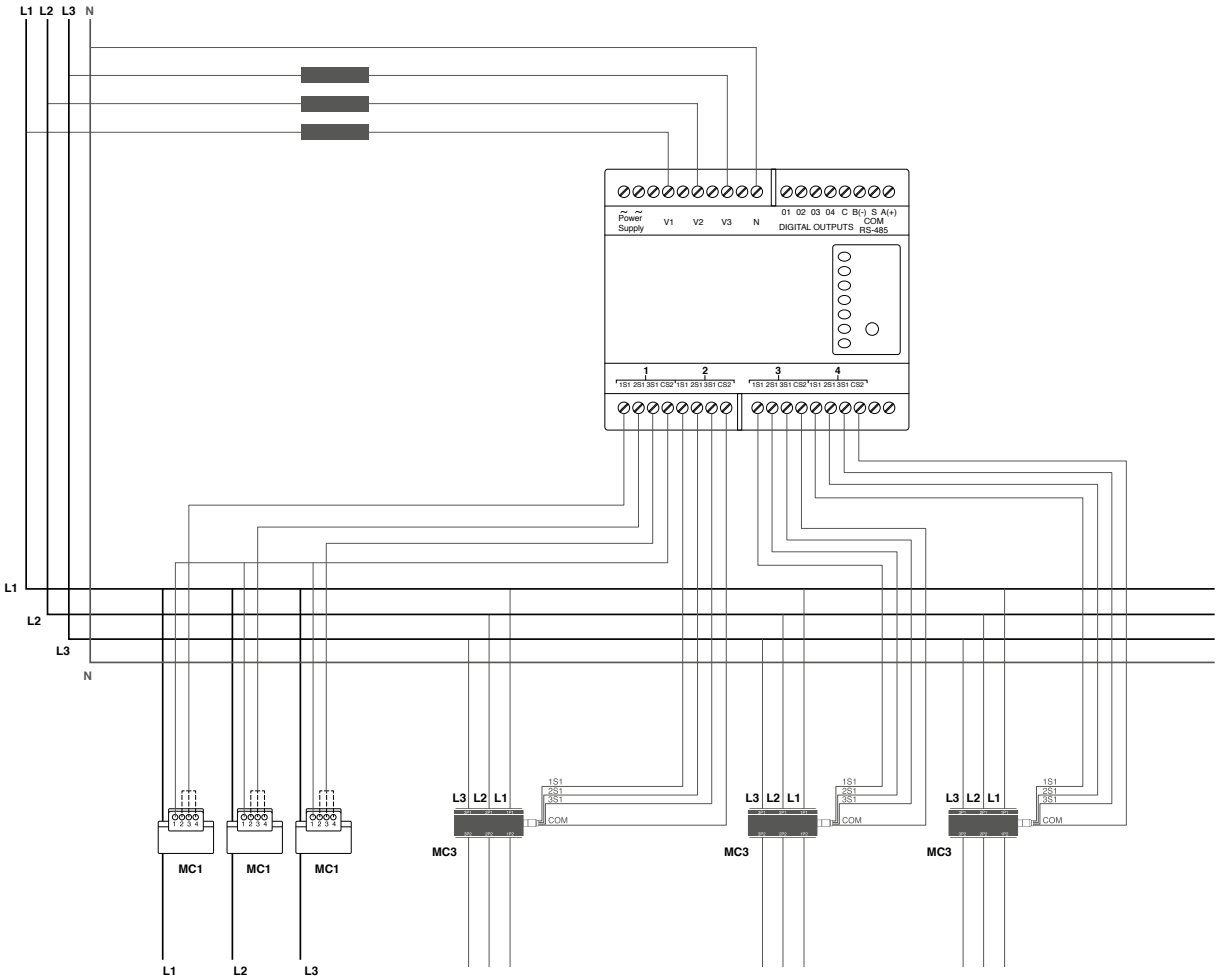
References

Quadrants	Communications	Protocol	Digital output	Measurement	Transformer type	Type	Code
4	RS-485	Modbus / RTU	4	4 three-phase channels	.../250 mA (type **MC**)	**CVM-NET4-MC-RS485-C4 M**	**M55732**

Dimensions



Connections



Accessories

CT, **TCH** and **TP** | **Transformers**
These units can be installed in installations with space restrictions. They are designed with a wide range of diameters and operating current values.
They are easily installed, ideal for switch outputs and provide highly accurate measurement. They can be mounted on panels or assembled on DIN rails with accessories.

STP | **Transformers**
Open-core current transformers with compact dimensions for easy installation. This type of transformer is very easy to install and uninstall on compact panels. In addition, these open-core transformers can measure current without the need to cut the power supply.

MC1 | **Transformers**
Very useful for installing in places where the exact nominal current range is not known. Each unit features 3 ratio ranges. Compliant with the **IEC 60044-1** Standard, featuring a 250 mA output for more efficient measurements.

MC3 | **Transformers**
The new system comprises three efficient transformers in the same enclosure. This innovative design provides important advantages during installation. Compliant with the **IEC 60044-1** Standard, featuring a 250 mA output for more efficient measurements.

RS2RS | **Converter**
Gateway that converts an RS-232 channel to RS-485. It can also operate as an amplifier-repeater of the signals of the RS-485 bus.

TCP1RS+ | **Converter**
Gateway designed to convert the Ethernet physical environment to RS-485.

CMBUS-8 | **Converter**
Gateway designed to convert the M-Bus protocol to Modbus, with up to 8 slave units.

CMBUS-24 | **Converter**
Gateway designed to convert the M-Bus protocol to Modbus, with up to 24 slave units.

AirGATEWAY | **Converter**
AirGATEWAY converts the Modbus serial environment to Radio.

AirBRIDGE | **Converter**
AirBRIDGE converts Radio signals to Modbus RS-485 signals for slave units.

AirREPEATER | **Repeater**
AirREPEATER is a repeater unit that expands the range of the Radio signal.

AirTHL | **Sensor**
AirTHL provides the infrastructure with wireless communications and can measure temperature, humidity and brightness.

AirHANZER | **Repeater**
AirHANZER is a handheld unit that measures radio signals, providing information about the available coverage and the need to install a repeater unit.

Wireless System

Energy management software

Energy supervision and centralisation software

PowerStudio is a powerful, simple and user-friendly software tool that can be used for the integral supervision of energy of power analyzers, energy meters, earth leakages and offers complete control of a wide range of magnitudes.

PowerStudio, together with **CIRCUTOR** units and systems, adapts to the needs of the installation, offering the following efficient management measures:

Versions

PowerStudio is available in three versions with different features, to suit the needs of the particular management system.

PowerStudio

PowerStudio SCADA

PowerStudio SCADA Deluxe

Electric energy management

- Creation of historical logs
- Baseline determination
- Control of energy costs
- Energy balance
- Energy consumption ratios
- Consumption reports

Essential tool for UNE 16001 / ISO 50001 certification

Improved productivity Maintenance

- Alarm tables
- Power quality control
- Analysis and management of technical variables
- Technical reports

Production costs

- Correct allocation of energy costs
- Energy ratio / unit of production
- Cost reports / production ratios

Additional software

SQL DATA

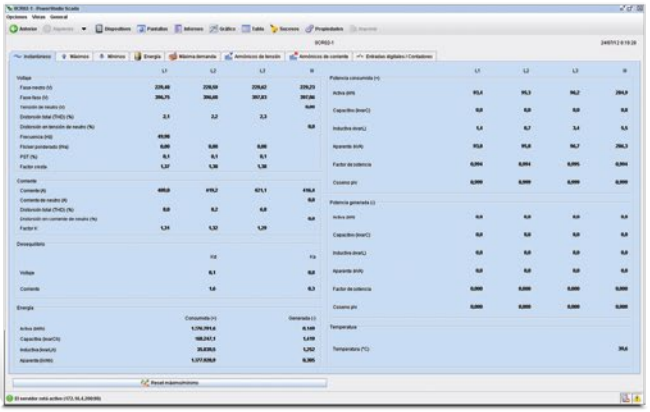
Modules for exporting historical logs to an SQL server

OPC-DA

Data connector for external systems with an OPC-DA client

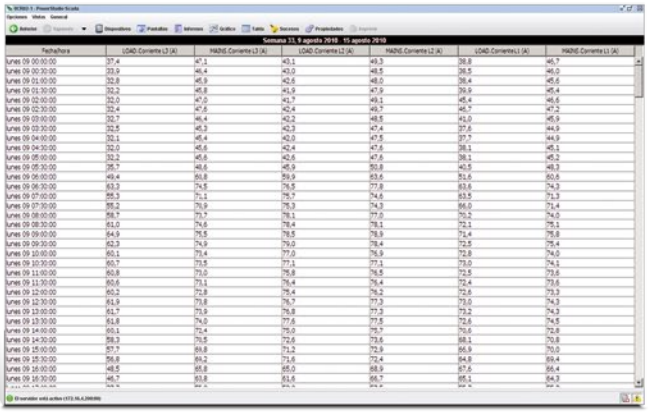
Real time variables

Displays all variables measured from all units in real time.



Tables

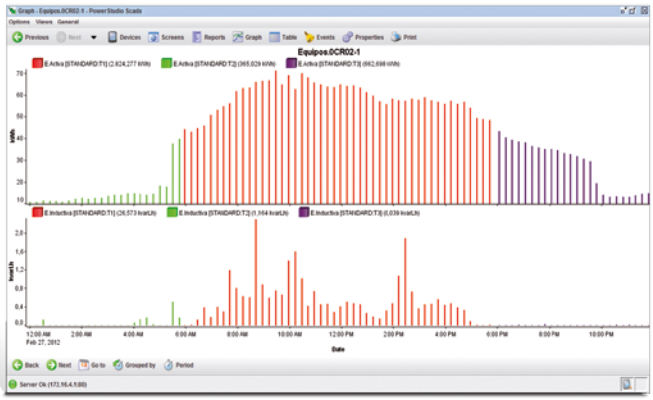
Displays data on tables; this information can be exported to .txt or .csv files.



Graphics

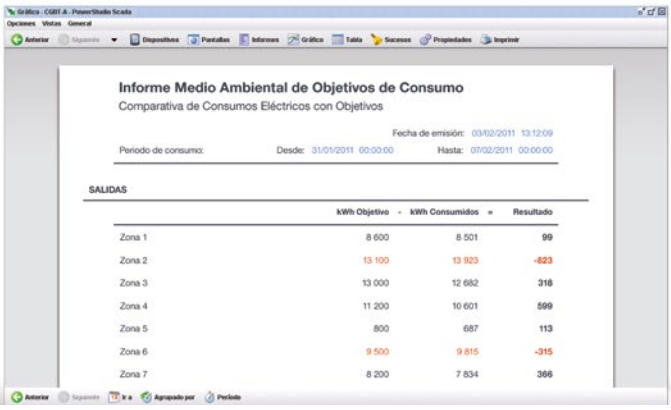
Graphical representation of the historical data recorded by software. Enables configuration of colours and layout individually.

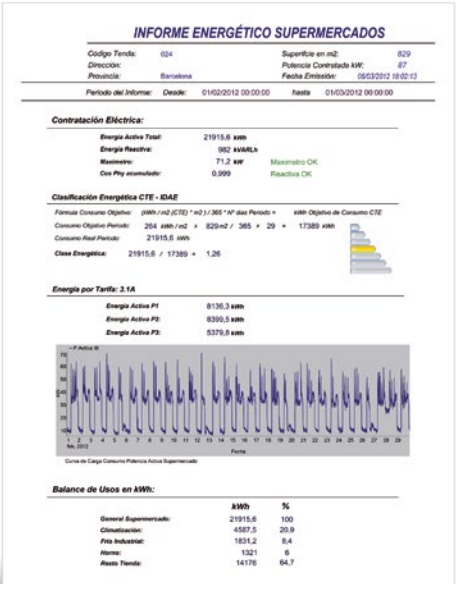
Displays multiple parameters simultaneously.



Reports

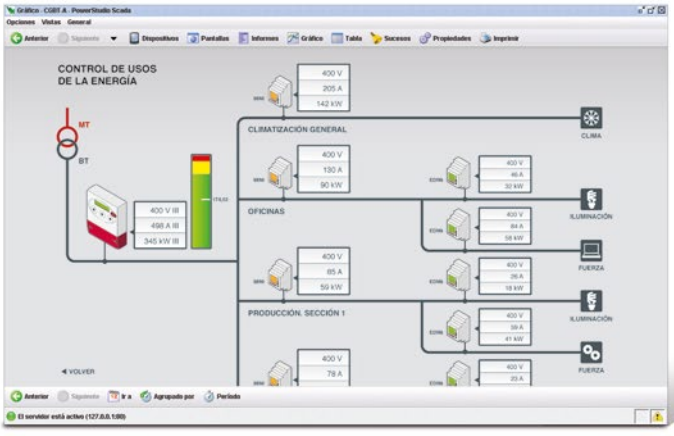
PowerStudio SCADA can generate reports for all types of bills, with the allocation of partial costs, production ratios, etc.





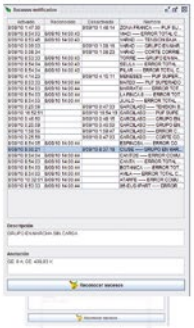
SCADA screens

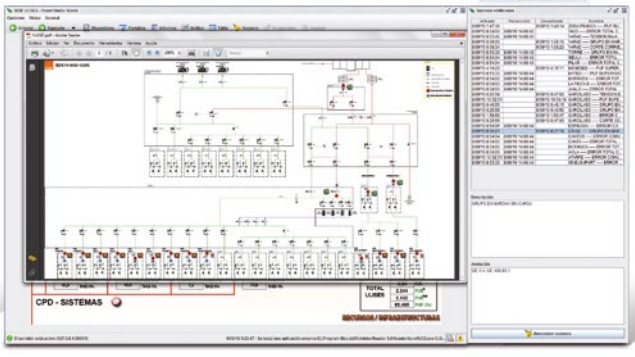
With SCADA screens you can configure all kinds of interactive windows, create personalised screens and combine different parameters from different **CIRCUTOR** units easily, thus obtaining the maximum amount of information possible in an intuitive and user-friendly environment.



Events

With the events module, you can control and automate alarms and events, automatically controlling the installation's most critical and important conditions.





CVM
Power analyzers

+ information: **comunicacion@circutor.com**

www.circutor.com

Designed by: Image and Communications Department - CIRCUTOR, SA

CIRCUTOR, SA - Vial Sant Jordi, s/n
08232 Viladecavalls (Barcelona) Spain
Tel. (+34) **93 745 29 00** - Fax: (+34) **93 745 29 14**
central@circutor.com

Code: C2M5G3 -01