

# CVM-A1500

## Power analyzer for panel with power quality measurement parameters



### Description

**CVM-A1500** is a panel mounted power quality analyzer with EMS (Energy Management Software) integrated. Its internal Web Server (html5) allows any user to have full installation control by using any web browser.

Designed to be installed in the most relevant or critical part of electric installations since it registers and monitors a wide range of variables (almost one year of data with RMS, maximum and minimum values). The device also registers power quality events such as swells, dips, interruptions (every half cycle) and transients (according to **IEC 61000-4-30** Class A). Any event will be immediately captured with the voltage and current waveform.

This model adds the measurement of power quality variables (defined in the standard **EN 50160**) such as flicker, unbalance (Kd) and asymmetry (Ka) coefficients or voltage and current harmonics decomposition up to 63th. In addition it is possible to monitor in real time the instantaneous waveforms of voltage and current through its oscilloscope function.

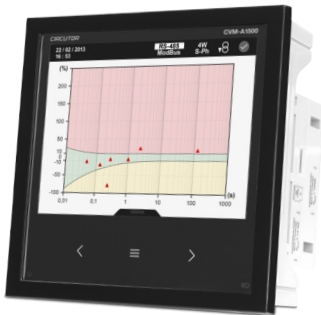
As an added value, **CVM-A1500** displays the number of events and transients on each affected phase with the level reached, duration and its associated waveform. In addition, those events are directly displayed in CBEMA, ITIC y SEMI-F47 graphs.

The smart design of the **CVM-A1500** allows users to customize their own screens in order to access to the information faster and easy. Remark that the device allows the connection through PowerStudio software to save and store, in a redundant way, all the information in a server or PC avoiding memory limits.

- Dimensions:144 x 144 mm
- Energy Management Software (EMS) included with historical data register
- Register of power quality events, waveforms and instantaneous parameters.
- Expandable up to 3 modules (inputs/outputs and communications)
- VGA color display with high definition
- IP 65 with airtight seal
- 5 voltage channels + 4 ITF current channels
- Active energy class 0,2S (**IEC 62053-22**)
- Universal switching power supply AC/DC or DC
- Ethernet communications (Web Server) + RS-485 (ModBus RTU or BACnet protocol)
- 5 user customizable screens
- 3 tariffs (selectable by digital input or by communications)
- Cost calculation(any currency) and emissions of kgCO<sub>2</sub>
- 2 relay outputs for alarms + 2 transistor outputs for alarms or pulses + 2 digital inputs to select tariff, to control logical states or pulse centralizer from any external meter.

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### Applications

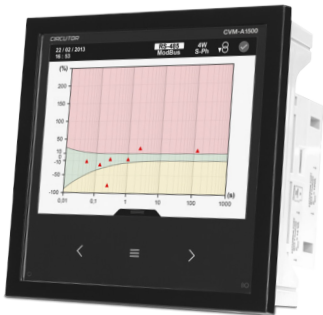
- Control, monitoring and logging of the power quality in High and Low Voltage distribution panels. Performed directly or remotely thanks to its WEB server. Integration in SCADA systems through XML requests.
- 4 alarms (2 per transistor and 2 per relay), fully and independently programmable according to a 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<sub>2</sub>, total meter or tariff hours).
- Transducer converting analogue signals to any instantaneous parameter measured or calculated by the unit, with built-in expansion modules with analogue outputs.
- Display of process signals featuring a built-in expansion module with analogue inputs, with optional reporting of these signals to SCADA systems through communications 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.
- Datalogger integrated with Web server and XML (log of historical data).

### Technical features

|                                      |   |  |   |   |  |
|--------------------------------------|---|--|---|---|--|
| <b>Power circuit</b>                 | Power supply voltage  | 85...265 Vac / 120...300 Vdc<br>20...120 Vdc (SDC model)   |   |   |  |
|                                      | AC frequency  | 50...60 Hz   |   |   |  |
|                                      | AC consumption  | max 29,4 V-A   |   |   |  |
|                                      | DC consumption  | max 11,9 W<br>max 13,8 W (SDC model)   |   |   |  |
| <b>Voltage measurement circuit</b>   | Voltage range   | 500 V <sub>p-n</sub> - 866 V <sub>p-p</sub> (functional up to 600 V <sub>p-n</sub> / 1000 V <sub>p-p</sub> )     |   |   |  |
|                                      | Frequency   | 40...70 Hz   |   |   |  |
|                                      | Measurement margin  | 7...200% of the U <sub>n</sub> for U <sub>n</sub> = 300 Vac. (p-n)   |   |   |  |
|                                      | Admissible overvoltage  | 750 Vac  |   |   |  |
|                                      | Maximum power consumption (limited current)                               | < 0.15 VA  |   |   |  |
|                                      | <b>Current measurement circuit</b>  | 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  |   |   |  |
| Measurement margin                   |   | 0.2...200% I <sub>n</sub> (.../5 A)<br>1...200% I <sub>n</sub> (.../1 A)<br>4...200% I <sub>n</sub> (.../250 mA) |   |   |  |
| Admissible overload                  |   | 2 I <sub>n</sub> A permanent, 100 A t < 1 s  |   |   |  |
| Consumption                          |   | < 0.9 VA   |   |   |  |
| <b>Maximum transformation ratios</b> | Primary V: 500,000 (500 kV)   |  |   |   |  |
|                                      | Primary A: 999.9 to 1.0 (10 kA) in .../5 A and .../1 A, 63...2000 A in MC | Prim V x Prim A < 60 MW  |   |   |  |
| <b>Maximum meter value (total)</b>   | Yes (Primary A / Secondary A) < 1000 (2 GW)                               |  |   |   |  |
|                                      | Yes (Primary A / Secondary A) ≥ 1000 (2 TW)                               |  |   |   |  |
| <b>Accuracy class</b>                |   | .../5 A  | .../1 A                                       | .../250 mA                                    |  |
|                                      | Voltage   | 0,1 ±1 digit<br>(20...600 V <sub>a.c.</sub> )  | 0,1 ±1 digit<br>(20...600 V <sub>a.c.</sub> ) | 0,1 ±1 digit<br>(20...600 V <sub>a.c.</sub> ) |  |
|                                      | Neutral voltage   | 0,5 ±1 digit<br>(55...500 V <sub>a.c.</sub> )  | 0,5 ±1 digit<br>(55...500 V <sub>a.c.</sub> ) | 0,5 ±1 digit<br>(55...500 V <sub>a.c.</sub> ) |  |
|                                      | Current   | 0,1 ±1 digit<br>(0,05...8 A)   | 0,1 ±1 digit<br>(0,01...1,2 A)                | 0,1 ±1 digit<br>(0,01...0,3 A)                |  |
|                                      | Neutral current   | 1 ±1 digit<br>(0,1...6 A)  | 1 ±1 digit<br>(0,05...1,2 A)                  | 1 ±1 digit<br>(calculated)                    |  |
|                                      | Active power  | 0,2 ±2 digits  | 0,2 ±2 digits                                 | 0,5 ±2 digits                                 |  |
|                                      | Reactive power  | 1 ±1 digit<br>(0,05...6 A)   | 1 ±1 digit<br>(0,01...1,2 A)                  | 1 ±1 digit<br>(0,01...0,3 A)                  |  |
|                                      | Active energy   | 0,2S   | 0,5S  | 0,5S  |  |
|                                      | Reactive energy   | 1  | 2   | 2   |  |
|                                      | <b>Display of harmonics</b>   | Voltage / Current  | to 63 <sup>rd</sup>                           |   |  |

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### Technical features

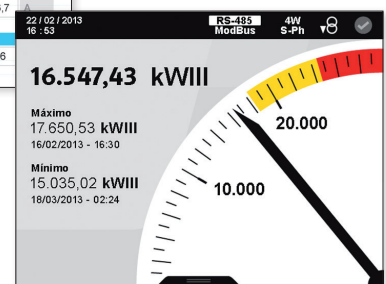
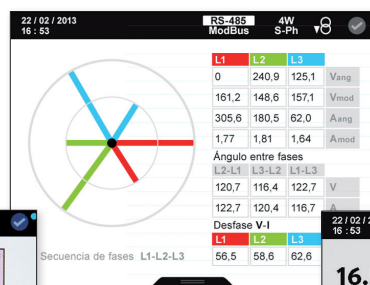
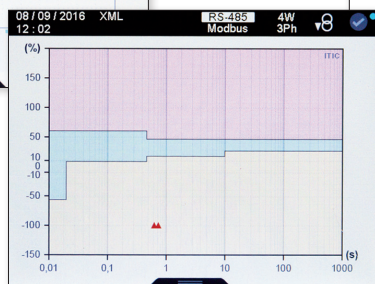
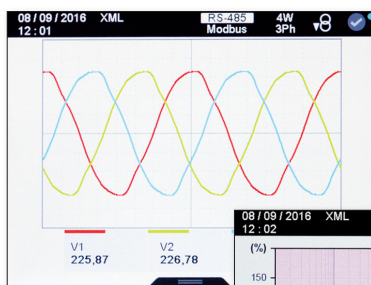
|                                       |   |
|---------------------------------------|---|
| <b>Connections</b>                    |   |
| <b>Digital inputs</b>                 | Selection of tariffs, states or external alarms   |
| Type                                  | Optoisolated potential-free contact   |
| Quantity                              | 2   |
| Activation current                    | 5 mA (15 V maximum voltage of open contact)   |
| Insulation                            | 4 kV  |
| <b>Digital outputs</b>                | Generation of impulses or alarms  |
| Type                                  | NPN transistor  |
| Quantity                              | 2   |
| Maximum operation voltage             | 48 Vdc  |
| Maximum switching current             | 130 mA  |
| Maximum frequency                     | 1 kHz   |
| Pulse duration ( $T_{on} / T_{off}$ ) | 0.3 / 0.7 ms (1 ms of a complete impulse)   |
| <b>Alarms</b>                         |   |
| Type                                  | Relay   |
| Quantity                              | 2   |
| Maximum operating power               | 1500 W  |
| Maximum voltage, open contacts        | 250 Vac   |
| Maximum switching current             | 6 A   |
| Electrical working life (400 V / 6 A) | $3 \times 10^4$ cycles  |
| Mechanical working life               | $1 \times 10^7$ cycles  |
| <b>Built-in communications</b>        | Protocols   |
|                                       | Modbus RTU / BACnet   |
| Speed                                 | 9600...115200   |
| bits, parity, stop                    | 8, n, 1 (configurable)  |
| <b>Environmental conditions</b>       | Working temperature   |
|                                       | -10...+50°C   |
| Relative humidity                     | 5...95%   |
| Altitude                              | 2000 m  |
| <b>Build features</b>                 | Format  |
|                                       | Assembly on 96x96 mm or 144x144 mm panel  |
| Depth                                 | 1 module  |
| Front panel IP protection             | IP 40 (IP 65 with sealing gasket)   |
| Rear panel IP protection              | IP 30   |
| <b>Safety</b>                         | Designed for CAT III 300/520 Va.c. installations, in accordance with <b>EN 61010</b><br>Double-insulated electric shock protection, class II  |
| <b>Standards</b>                      | <b>IEC 62053-22, ANSI (class 0.2S), IEC 62053-24 (Class 1) / ANSI C12.1 (Class 2), class A acc. to IEC 61000-4-30, IEC 61010, IEC 61000, UNE-EN 55022</b><br>Measurement acc. to <b>MID, UL</b> certification <b>IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-11, IEC 61000-4-4, IEC 61000-4-5</b> |

### References

#### 144 x 144

| Current measuring secondaries | Type                               |
|-------------------------------|------------------------------------|
| .../5 or .../1 A or ...250 mA | <b>CVM-A1500-ITF-RS485-ICT2</b>    |
| .../5 or .../1 A or ...250 mA | <b>CVM-A1500-SDC-ITF-485-ICT2*</b> |

\* Power supply 20...120 Vdc



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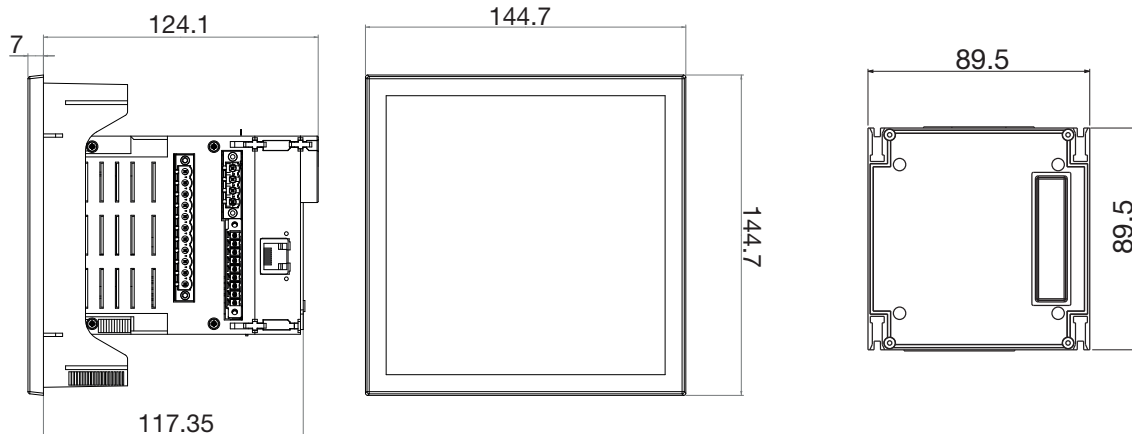
## Expandable modules for CVM-A1500

| Outputs                    | Digital Inp. | Analogue Inp.   | Communication | Protocol                                  | Type                      |
|----------------------------|--------------|-----------------|---------------|---|---------------------------|
| 8 Trans.(*)                | 8            | -               | -             | -   | M-CVM-AB-8I-8OTR          |
| 8 relay                    | 8            | -               | -             | -   | M-CVM-AB-8I-8OR           |
| 8 (0/4...20 mA)            | -            | 4 (0/4...20 mA) | -             | -   | M-CVM-AB-4AI-8AO          |
| Ethernet (RS-485 Bridge)   |              |                 |               | Modbus / TCP                              | M-CVM-AB-Modbus-TCPBridge |
| Ethernet (Ethernet Bridge) |              |                 |               | Modbus / TCP                              | M-CVM-AB-Modbus-Switch    |
| MBus                       |              |                 |               | MBus                                      | M-CVM-AB-MBUS             |
| LonWorks                   |              |                 |               | LonTalk<br>ISO/IEC 14908<br>ANSI/EIA 7091 | M-CVM-AB-LonWorks         |
| -                          | -            | -               | -             | Profibus/DP                               | M-CVM-AB-Profibus         |

| Description                               | Type        |
|---|-------------|
| IP 65 sealing gasket for CVM-AB (144x144) | IP65-AB-144 |

## Dimensions

### CVM-A1500



Window level: 138x138 mm

Note: Refer to the product manual for other options

