Overview

Energy management
Em² Server: Cloud solution for multi-site monitoring

Home page
- Integrated MAP view
- Hierarchical tree to navigate data with ease
- Movable and resizable views fitting the needs of a control room

Monitoring and analysis tool
- Historical data analysis tools
- Graphical monitoring features
- Comprehensive data exporting tools (standard XLS format)

Login page
- Multilingual web based user interface
- User rights management
- Concurrent data access from multiple locations

Synoptics tool
- User defined background
- Active iconized energy meters showing real time variables and status
- Multiple synoptic views may be created

Load profile tool
- Load profile statistical analysis based on actual data
- Profiles may be exported as Excel files or represented as charts
- Calculation of average, median, maximum and statistical confidence range
Overview

Energy management

CTD 1X/2X/3X/4X
- For cable or bus-bar
- Cable: Ø23 mm to Ø51 mm
- Bar: 20x5 mm to 64x20 mm or 51x43 mm
- Sealable terminal covers
- Primaries from 50 A to 1600 A
- Secondary: 5 A (standard) 1 A (available upon request)
- EN61869-2
- CE, cULus, CSA

CTD 5S/6S
- Split-core for cable or bus-bar
- Cable: Ø26 mm to Ø50 mm
- Bar: 26x32 mm, 50x52 mm
- Sealable terminal covers
- Primaries from 100 A to 1000 A
- Secondary: 5 A (standard) 1 A (available upon request)
- EN61869-2
- CE, cULus, CSA

CTD 8/9/10/11 S, V, H, Q
- Solid or split-core for cable or bus-bar
- Cable: Ø26 mm to Ø50 mm
- Bar: 81x31 mm (horizontal) to 38x127 mm
- Sealable terminal covers
- Primaries from 100 A to 1000 A
- Secondary: 5 A (standard) 1 A (available upon request)
- EN61869-2
- CE, cULus, CSA

CTV 1X/2X/3X/4X
- Split-core current sensor for cable
- Cable: Ø9.6 mm to 20 mm
- Primaries from 60 A to 400 A
- Secondary: 0.333 VAC

3-phase power analyzers

WM20
- Dimensions: 96 x 96 mm
- Installation: panel mounting
- Accuracy 0.2% (voltage, current)
- Nominal voltage rating: 600 Vll
- Front protection degree IP65, NEMA4X, NEMA12
- Modular housing to build the instrument according to the real application needs
- Modbus and BACNet (both RS485 or Ethernet), and Profinet DPV0 communication port available
- Configuration software (PC or Android app)
- cULus

WM30 / WM40
- Dimensions: 96 x 96 mm
- Installation: panel mounting
- Accuracy 0.2% (voltage, current)
- Nominal voltage rating: 600 Vll
- Front protection degree IP65, NEMA4X, NEMA12
- Modular housing to build the instrument according to the real application needs
- Modbus and BACNet (both RS485 or Ethernet), Profinet DPV0, and Ethernet/IP communication port available
- 16-alarm PLC logic and digital inputs for utility metering (WM40)
- 8xOptoProg datalogger for instantaneous variables, trend profiles and events (WM40)
- Configuration software (PC or Android app)
- cULus, Solar California listed

WM50 and TCD12
- Dimensions: 96 x 96 mm
- Installation: panel mounting
- Up to 96 channels, 32 A, 65 A max (8x TCD12)
- Accuracy 0.2% (voltage, main current), 0.5% (branch currents)
- Nominal voltage rating: 480 Vll
- Modbus communication port available (RS485 or Ethernet)
- Up to 6 digital outputs (static or relay) and 6 digital inputs or temperature and analogue input
- 96 channel alarms, freely settable set point for load monitoring
- Built-in datalogger for instantaneous variables, trend profiles and events (WM50)
- Configuration software (PC or Android app)
- cULus

Communication interface OptoProg

OptoProg
- Bluetooth and USB interface for meters and analysers with optical port
- Compatible with WM20, WM30, WM40, WM50 and ET100, ET300 families
- Compatible with UCS PC software and UCS Mobile Android APP
- Battery powered
- CE, FCC, IC, Bluetooth

CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.
### Energy management

#### 1-phase energy meters for 32A

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Installation</th>
<th>Electromechanical totalizer</th>
<th>Bi-directional energy metering, 7 digits cl. B (EN50470)</th>
<th>Measuring inputs: 115/230 VAC, 32 A (max 45 A)</th>
<th>Self-powered</th>
<th>Pulse output</th>
<th>Sealable terminal covers</th>
<th>CE, MID (PFB), cULus (115 V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM110</td>
<td>1 DIN module</td>
<td>DIN-rail</td>
<td></td>
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</tr>
<tr>
<td>EM111</td>
<td>1 DIN module</td>
<td>DIN-rail</td>
<td>Backlit touch LCD</td>
<td>Bi-directional energy metering, 7 digits cl. B (EN50470)</td>
<td>Measurement inputs: 115/230 VAC, 32 A (max 45 A)</td>
<td>Self-powered</td>
<td>Pulse output or RS485 Modbus or M-Bus port</td>
<td>Sealable terminal covers</td>
<td>CE, MID (PFA and PFB), cULus (L-N 115 V)</td>
</tr>
<tr>
<td>EM112</td>
<td>2 DIN modules</td>
<td>DIN-rail</td>
<td>Backlit touch LCD</td>
<td>Display backup by supercapacitor</td>
<td>Measurement of voltage, current, power, power factor and frequency</td>
<td>Bi-directional energy metering, 8 digits cl. B (EN50470)</td>
<td>Measuring inputs: 115/230 VAC, 100 A</td>
<td>Self-powered</td>
<td>Pulse output or RS485 Modbus or M-Bus port</td>
</tr>
</tbody>
</table>

#### 1-phase energy analyzers up to 100A

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Installation</th>
<th>Measurement of voltage, current, power, power factor and frequency</th>
<th>Bi-directional energy metering, 3x 8-digit, cl. B (EN50470)</th>
<th>Nominal voltage rating 480 VLL</th>
<th>Auxiliary power supply</th>
<th>Dual tariff management</th>
<th>Pulse output or RS485 Modbus or M-Bus port</th>
<th>Sealable terminal covers</th>
<th>CE, MID (PFA and PFB), cULus</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM111</td>
<td>1 DIN module</td>
<td>DIN-rail</td>
<td>Backlit touch LCD</td>
<td>Measurement of voltage, current, power, power factor and frequency</td>
<td>Bi-directional energy metering, 7 digits cl. B (EN50470)</td>
<td>Nominal voltage rating: 480 VLL</td>
<td>Self-powered</td>
<td>Pulse output or RS485 Modbus or M-Bus port</td>
<td>Sealable terminal covers</td>
<td>CE, MID (PFA and PFB), cULus (L-N 115 V)</td>
</tr>
<tr>
<td>EM112</td>
<td>2 DIN modules</td>
<td>DIN-rail</td>
<td>Backlit touch LCD</td>
<td>Display backup by supercapacitor</td>
<td>Measurement of voltage, current, power, power factor and frequency</td>
<td>Bi-directional energy metering, 8 digits cl. B (EN50470)</td>
<td>Measuring inputs: 115/230 VAC, 100 A</td>
<td>Self-powered</td>
<td>Pulse output or RS485 Modbus or M-Bus port</td>
<td>Sealable terminal covers</td>
</tr>
</tbody>
</table>

#### 3-phase energy transducers

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Installation</th>
<th>Backlit touch LCD</th>
<th>Measurement of voltage, current, power, power factor and frequency</th>
<th>Bi-directional energy metering, 2 tariffs, cl. 1 (EN62053-1)</th>
<th>Nominal voltage rating: 480 VLL</th>
<th>Self-powered</th>
<th>RS485 Modbus port (screw, 2x RJ45)</th>
<th>Optical port</th>
<th>Sealable terminal covers</th>
<th>CE, cULus</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM330</td>
<td>3 DIN modules</td>
<td>DIN-rail</td>
<td></td>
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</tr>
<tr>
<td>ET330</td>
<td>3 DIN modules</td>
<td>DIN-rail</td>
<td>Backlit touch LCD</td>
<td>Measurement of voltage, current, power, power factor and frequency</td>
<td>Bi-directional energy metering on 2 8-digit counters, cl. B (EN60470-3)</td>
<td>Nominal voltage rating: 600 VLL (AW5), 250 VLL (AW6)</td>
<td>Self-powered</td>
<td>RS485 Modbus port (screw, 2x RJ45)</td>
<td>Optical port</td>
<td>Sealable terminal covers</td>
<td>CE, cULus</td>
</tr>
<tr>
<td>EM24</td>
<td>4 DIN modules</td>
<td>DIN-rail</td>
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</tbody>
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Energy management

**Quick-fit 3-phase energy analyzers**

- **EM270 / EM271 / EM280**
  - Dimensions: 4 DIN modules or 72x72 mm
  - Installation: DIN-rail or panel mounting
  - LCD with two installation options
  - Measurement of voltage, current, power, power factor and frequency
  - Bi-directional energy metering, 3 x 3-digit or 8-digit readout, cl. B (EN50470)
  - Nominal voltage rating: 415 V/3
  - Outputs: 2 pulse (loads 1 and 2)
  - RS485 Modbus RTU
  - CE, cULus

- **TCD 1X/TCD 2X/TCD 3X**
  - Dimensions (LxWxH): TCD-1X: 74.8x72x66.80 mm
    TCD-2X: 105x72x50 mm
    TCD-3X: 135x78x50 mm
  - Bus-bar sizes:
    TCD-1X: 15x90x30.48 mm
    TCD-2X: 21x26x25.26 mm
    TCD-3X: 31.25x31.25 mm
  - Centre-to-centre distance:
    TCD-1X: 25 mm
    TCD-2X: 35 mm
    TCD-3X: 45 mm
  - Primary:
    TCD-1X: 160 A
    TCD-2X: 250 A
    TCD-3X: 630 A
  - CE, UL (with EM270)

- **TCM**
  - Equivalent to Class 1 (currents) of IEC61869-2
  - Primary: 60 A (TCM0M), 100 A (TCM1M), 400 A (TCM3M)
  - Hole size: 9.6 mm (TCM0M), 15.5 mm (TCM1M), 20.5 mm (TCM3M)
  - Cable length: 1.6 m (TCM0M), 1.5 m (TCM1M and TCM2M), 2.0 m (TCM3M)
  - Auto-detection of the primary current rated value by the EM271 energy meter
  - TCM head for wall and DIN-rail mounting
  - Umbilical connection (80 cm) from TCM head to EM271 energy meter through RJ11
  - CE, UL (with EM270)

- **TCO6 BX / TCD06 BS**
  - Equivalent to Class 0.5 (BX) and 1 (BS) (current) of IEC61869-2
  - Solid core (BX) or split core (BS)
  - Primary current: 32 A
  - Hole size: 7 mm (BX) or 8.5 mm (BS)
  - Hole centre distance: 17.5 mm
  - R11 cable length: 80, 150 or 200 cm
  - Auto-detection of the primary current rated value by the EM280 energy meter
  - CE, UL (with EM270)

**Rogowski coil for EM210**

- **EM210**
  - Dimensions: 4 DIN modules or 72x72 mm
  - Installation: DIN-rail or panel mounting
  - LCD with two installation options
  - Measurement of voltage, current, power, power factor and frequency
  - Bi-directional energy metering, 3 x 3-digit or 8-digit readout, cl. B (EN50470)
  - Nominal voltage rating: 415 V/3
  - Outputs: 2 pulse (loads 1 and 2)
  - RS485 Modbus RTU
  - CE, cULus

- **ROG 4K**
  - Flexible current sensor (Rogowski coil) for EM210 (MV version)
  - Primary current from 20 to 4000 A
  - Extended accuracy range ± 1%
  - Internal diameter from 115 mm to 275 mm
  - User-friendly and safe coil closing system
  - Direct connection to EM210 MV energy analyzer
  - No power supply or external integrator required
  - Coloured label on the cable for error-free connection check
  - CE, cULus

**3-phase power transducers**

- **CPT DIN**
  - Dimensions: 45 x 83.5 x 98.5 mm
  - Installation: DIN-rail
  - Programmable one-, two- and three-phase measurement transducer
  - Measurement of voltage, current, power, power factor, frequency and energy
  - Energy metering, 9 digits
  - Measuring inputs: 3 x 230/400 VAC, 5 A
  - Power supply: 18-60 or 90-260 VDC/AC
  - Outputs: 3 analogue 20 mA, or 3 10 VDC, 2 relays for alarms
  - RS485 Modbus RTU
  - CE, cULus, CSA

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# Energy management

## Monitoring gateway and controller
- **UWP 3.0**
  - Micro PC with embedded Web-Server
  - Data and event logging from Modbus, Modbus/TCP and Duplex® devices
  - Local gateway functions (to BACNet and Modbus/TCP)
  - Remote gateway functions (FTP, SFTP, FTPS, Rest-API)
  - Microsoft Azure Certified for IoT
  - Large ecosystem of compatible meters, sensors, actuators
  - Flexible control functions
  - Energy efficiency monitoring
  - Building automation control
  - Car parking guidance

- **SH2 DSP24**
  - Dimensions: 2-DIN modules
  - USB port to supply dongle modems
  - Support for Wi-Fi / USB key
  - Watchdog features to prevent common mobile network glitches
  - 24 VDC supplied

- **Em² Server**
  - Virtual machine for energy data management
  - Multi-site monitoring management
  - Flexible and scalable architecture
  - VMware® technology compatibility
  - Load profile management
  - Data analysis and benchmark
  - Data and event logging
  - Customizable graphical synoptic
  - All data exported in format compatible with Excel or other spread sheets
  - Tariffs and contract management
  - Alarms management
  - Database replication from up to 100 VMU-C EM

## USB dongle connection modules
- **CPA050**
  - Dimensions: 63x46x25 mm (without connectors)
  - Installation: DIN-rail and panel mounting
  - 1-phase AC (from 1 to 400 Hz) or DC
  - Power supply from 9 to 30 VDC
  - Contactless Hall effect sensing for current ø 15 mm hole
  - True RMS AC and DC monitoring
  - Voltage range: 800 VAC, 1000 VDC
  - Current range: 50 AAC, 50 ADC

- **CPA300**
  - Dimensions: 99x89x30 mm (without connectors)
  - Installation: DIN-rail and panel mounting
  - 1-phase AC (from 1 to 400 Hz) or DC
  - Power supply from 9 to 30 VDC
  - Contactless Hall effect sensing for current ø 33 mm hole
  - True RMS AC and DC monitoring
  - Voltage range: 800 VAC, 1000 VDC
  - Current range: 300 AAC, 400 ADC

- **ET272 + VMU C EM**
  - Dimensions: 4 DIN modules
  - Installation: DIN-rail mounting
  - Two 3-phase energy transducers in one
  - Current measurement by split-core with RJ plug
  - Quick installation through RJ connectors
  - Automatic recognition of CT ratios
  - Measurement of voltage, current, power, power factor and frequency
  - Energy metering, cl. 1
  - Nominal voltage rating: 415 V, current range according to the TCD accessories
  - Outputs: 2 pulse (loads 1 and 2)
  - RS485 Modbus RTU
  - Self addressing function by means of VMU C EM
  - CE, cULus

## Cloud solution for multi-site monitoring
- **Em² Server**
  - Virtual machine for energy data management
  - Multi-site monitoring management
  - Flexible and scalable architecture
  - VMware® technology compatibility
  - Load profile management
  - Data analysis and benchmark
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  - Customizable graphical synoptic
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