

Em² Server: Software for multi-site monitoring



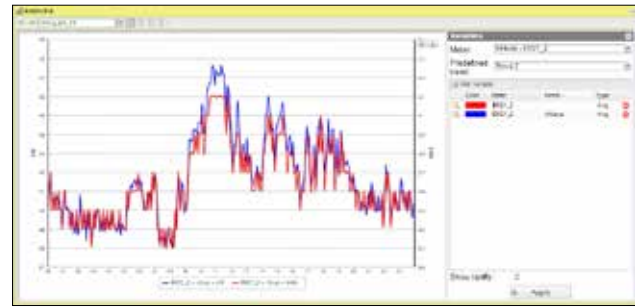
Main page

- Web-based access via standard browser
- Either On-Premises or Cloud deployment
- Multiple accounts with configurable access rights
- Map for locating UWP 3.0 and VMUC EM devices
- Navigator tool for organizing the system in cost centres according to the needs
- On-the-fly update of the whole database, during the reception of data



Monitoring tool

- Real time (according to sampling interval) and historical data displaying of each energy meter and power analyser variables
- Easy navigation of available meters and cost centres



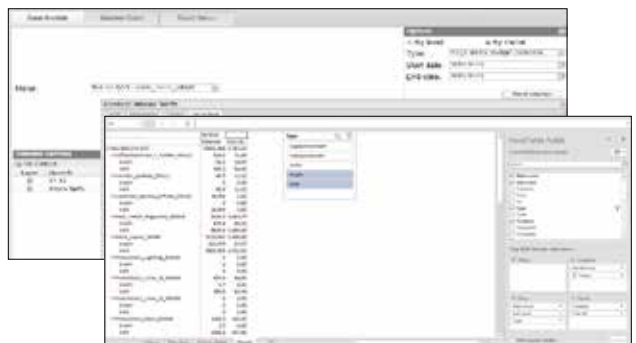
Analysis tool

- Real time (according to sampling interval) and historical data displaying of any combination of variables
- Comparison of trends in different time intervals



Load profile tool

- Statistical analysis of daily consumption data
- Calculation of the daily baseline
- Estimation of the maximum power for dealing with energy suppliers



Report

- Calendar and tariff settings for cost calculation
- Multiple contracts management for cost simulation
- Excel reports with Pivot table for analysing consumptions and energy cost over a time interval
- Report split into user / cost centre (for a selectable group of devices)

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CARLO GAVAZZI
Automation Components

Energy to Components!

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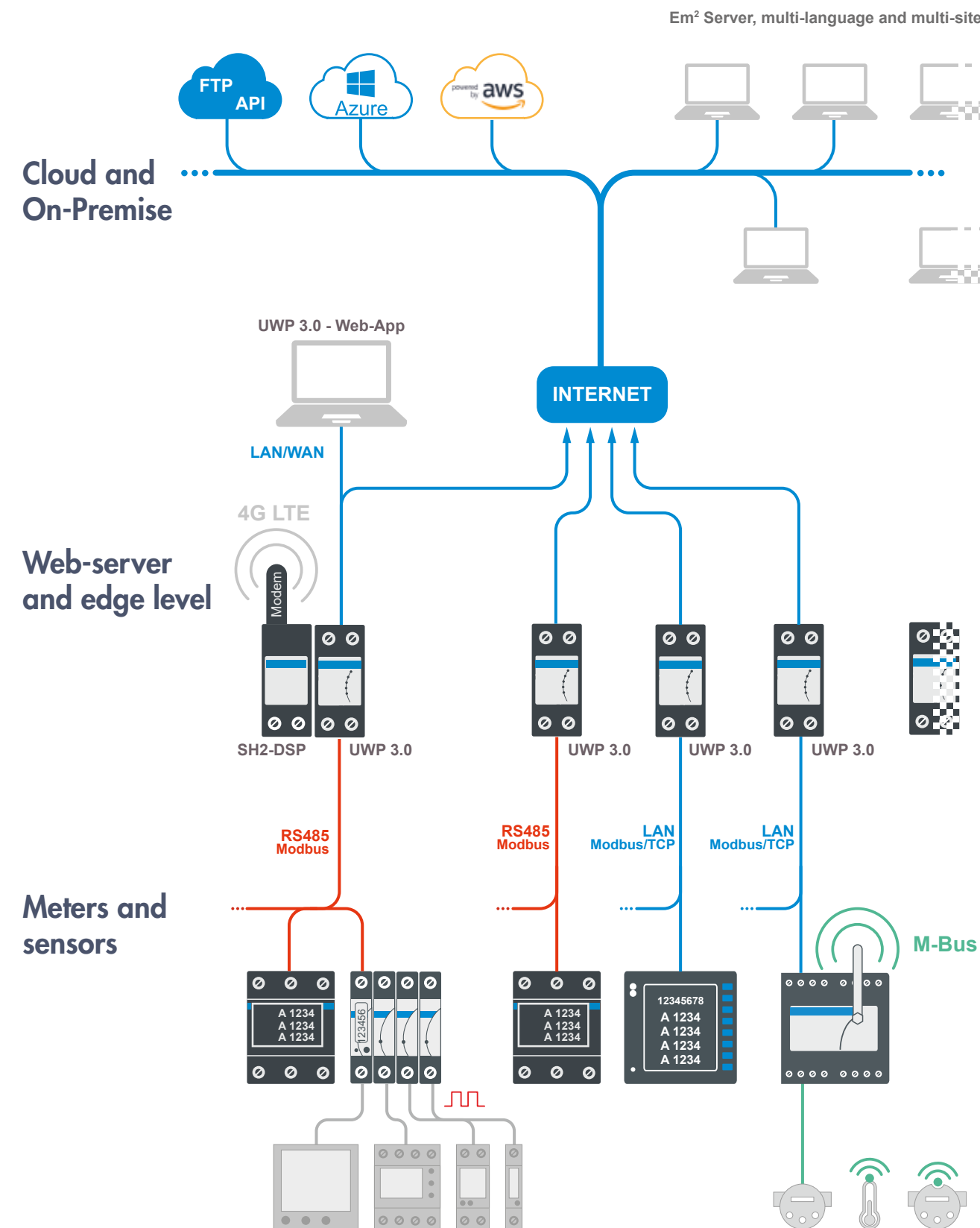
CARLO GAVAZZI
Automation Components



Overview

Energy management

Overview Diagram



Overview

Energy management

CT for cable or bus-bar	CT for cable or bus-bar	CT for cable or bus-bar	CT for cable	CTA for cable
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CTD 1X/2X/3X/4X **CTD 5S/6S** **CTD 8/9/10/11 S, V, H, Q** **CTV 1X/2X/3X/4X/6X/8X** **CTA 5X/6X**

- 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, cURus
- 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, cURus
- Solid or split-core for cable or bus-bar
 - Bar: 31x81 mm (vertical), 81x31 mm (horizontal) to 38x127 mm
 - Sealable terminal covers
 - Primaries 150 A to 3200 A
 - Secondary: 5 A (standard) 1 A (available upon request)
 - EN61869-2
 - CE, cURus
- Split-core current sensor for cable
 - Cable: Ø9.5 mm to 35.5 mm
 - Bar: 50x90 mm (CTV-8X)
 - Primaries from 60 A to 800 A
 - Secondary: 0.333 VAC
 - CE, cURus
- Split-core current sensor for cable
 - Cable: Ø24 mm to 36 mm
 - Primaries from 100 A to 600 A
 - Secondary: 5 AAC
 - CE, cURus

3-phase power analyzers	3-phase power analyzers	3-phase power quality analyzers	3-phase branch circuit power analyzers
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WM15 **WM20** **WM30 / WM40** **WM50 and TCD12**

- Dimensions: 96 x 96 mm
 - Installation: panel mounting
 - Power analyzers, metering from external inputs, THD measurement.
 - Measurement of voltage, current, power, power factor and frequency.
 - Bi-directional energy metering on 10-digit counters, d. B (EN50470-3)
 - Voltage inputs: 230, 400, 480 or 600 V_{LL}
 - Current inputs: 5 A
 - Auxiliary or self-power supply
 - RS485 Modbus RTU, and pulse outputs
 - Sealable terminal covers
 - CE, MID (PF), cULus
- Dimensions: 96 x 96 mm
 - Installation: panel mounting
 - Accuracy 0.2% (voltage, current)
 - Universal power supply
 - 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 Profibus DPVO communication port available
 - Configuration software (PC or Android app)
 - cULus
- Dimensions: 96 x 96 mm
 - Installation: panel mounting
 - Accuracy 0.2% (voltage, current)
 - Universal power supply
 - 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), Profibus DPVO and EtherNet/IP communication port available
 - 16-alarm PLC logic and digital inputs for utility metering (WM40)
 - Built-in datalogger for instantaneous variables, dmd profiles and events (WM40)
 - Configuration software (PC or Android app)
 - cULus, Solar California listed
- 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)
 - 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 variables/events
 - Configuration software (PC or Android app)
 - cULus

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Energy management

1-phase energy meters for 32A	1-phase energy analyzers for 32A	1-phase energy analyzers up to 100A	3-phase energy analyzers
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EM110 **EM111** **EM112** **EM330 / EM340**

- Dimensions: 1 DIN module
 - Installation: DIN-rail
 - Electromechanical totalizer
 - Bi-directional energy metering, 7 digits d. B (EN50470)
 - Measuring inputs: 115/230 VAC, 32 A (max 45 A)
 - Self-powered
 - Pulse output
 - Sealable terminal covers
 - CE, MID (PFB), cULus (115 V)
- Dimensions: 1 DIN module
 - Installation: DIN-rail
 - Backlit touch LCD
 - Measurement of voltage, current, power, power factor and frequency
 - Bi-directional energy metering, 7 digits d. B (EN50470)
 - Measuring inputs: 115/230 VAC, 32 A (max 45 A)
 - Self-powered
 - Dual tariff management
 - Pulse output or RS485 Modbus or M-Bus port
 - Sealable terminal covers
 - CE, MID (PFA and PFB), cULus (115 V)
- Dimensions: 2 DIN modules
 - Installation: DIN-rail
 - Backlit touch LCD
 - Display backup by supercapacitor
 - Measurement of voltage, current, power, power factor and frequency
 - Bi-directional energy metering, 8 digits, d. B (EN50470)
 - Measuring inputs: 115/230 VAC, 100 A
 - Self-powered
 - Dual tariff management
 - Pulse output or RS485 Modbus or M-Bus port
 - Sealable terminal covers
 - CE, MID (PFA and PFB), cULus (115 V)
- Dimensions: 3 DIN modules
 - Installation: DIN-rail
 - Backlit touch LCD
 - Measurement of voltage, current, power, power factor and frequency
 - Bi-directional energy metering, 3x 8-digit, d. B (EN50470)
 - Quick installation through RJ connectors
 - Automatic recognition of CT ratios
 - Measurement of voltage, current, power, power factor and frequency
 - Active energy: Equivalent to Class 1 (EN62053-21)
 - Inputs: 3x230(440)VAC, current range according to the TCD accessories
 - Outputs: 2 pulse (loads 1 and 2)
 - RS485 Modbus RTU
 - CE, cULus

1 and 3-phase energy transducers	Communication interface OptoProg	3-phase power transducers	3-phase energy analyzers
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ET112 / ET330 / ET340 **OptoProg** **CPT DIN** **EM24**

- Dimensions: 2 DIN (ET112); 3 DIN (ET330, ET340) modules
 - Installation: DIN-rail
 - Measurement of voltage, current, power, power factor and frequency.
 - Bi-directional energy metering, 2 tariffs, d. 1 (EN62053-1)
 - Measuring inputs: 115/230 VAC, 100 A (ET112); 208 to 400 V_{LL} AC, 5(6) A current input via current transformer (ET330); 65 A (ET340);
 - Self-powered
 - RS485 Modbus port (screw, 2x RJ45)
 - Optical port
 - Sealable terminal covers
 - CE
- Bluetooth and USB interface for meters and analysers with optical port
 - Compatible with WM15, WM20, WM30, WM40, WM50 and ET100, ET300 families
 - Compatible with UCS PC software and UCS Mobile Android APP
 - Battery powered
 - CE, FCC, IC, Bluetooth
- 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: 3x230(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, cURus, CSA
- Dimensions: 4 DIN modules
 - Installation: DIN-rail
 - Meter for energy from CT 5 A or for direct energy from 5 A. External pulse counting
 - Measurement of voltage, current, power, power factor and frequency
 - Bi-directional energy metering on 2 8-digit counters, d. B (EN50470-3)
 - Voltage inputs: 3x230(400) VAC
 - Current inputs: 5 A, 65 A
 - 115-230 VAC or self-powered
 - 3 inputs for external dimension counting (IS)
 - Pulse or relay output; RS485 (Modbus RTU), Ethernet (Modbus TCP), M-Bus (wired and wireless)
 - Sealable terminal covers
 - CE, MID (PF), cULus (5 A and Ethernet ver.)

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Energy management

Quick-fit 3-phase energy analyzers	3-phase CT for EM270 for cable or bus-bar	Multiple miniature split-core current sensor for EM271	Multiple current transformer block for EM280
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EM270 / EM271 / EM280 **TCD 1X/TCD 2X/TCD 3X** **TCD M** **TCD06 BX / TCD06 BS**

- Dimensions: 4 DIN modules or 72x72 mm
 - Installation: DIN-rail or panel mounting
 - Two 3-phase energy analyzers with sum function
 - Current measurement by triple CT, solid core (EM270), split-core (EM271) with RJ plug, 6 transformers block (EM280)
 - Quick installation through RJ connectors
 - Automatic recognition of CT ratios
 - Measurement of voltage, current, power, power factor and frequency
 - Active energy: Equivalent to Class 1 (EN62053-21)
 - Inputs: 3x230(440)VAC, current range according to the TCD accessories
 - Outputs: 2 pulse (loads 1 and 2)
 - RS485 Modbus RTU
 - CE, cULus
- Equivalent to class 0.5 (current) of IEC61869-2
 - Dimensions (LxHxP): TCD-1X: 74.84x72x66.80 mm TCD-2X: 105x72x50 mm TCD-3X: 135x78x50 mm
 - Bus-bar sizes: TCD-1X: 15.90x30.48 mm TCD-2X: 21.26x25.26 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)
- Equivalent to class 1 (currents) of IEC61869-2
 - Primary: 60 A (TCD0M), 100 A (TCD1M), 200 A (TCD2M), 400 A (TCD3M)
 - Hole size: 9.6 mm (TCD0M), 15.5 mm (TCD1M), 15.5 mm (TCD2M), 20.5 mm (TCD3M)
 - Cable length: 1.8 m (TCD0M), 1.5 m (TCD1M and TCD2M), 2.0 m (TCD3M)
 - Auto-detection of the primary current rated value by the EM271 energy meter
 - TCD M head for wall and DIN-rail mounting
 - Umbilical connection (80 cm) from TCD M head to EM271 energy meter through RJ11
 - CE, UL (with EM271)
- Equivalent to class 0.5 (BX) and class 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
 - RJ11 cable length: 80, 150 or 200 cm
 - Auto-detection of the primary current rated value by the EM280 energy meter
 - CE, UL (with EM280)

3-phase energy analyzers for 5A, CTV or ROG 4K	Rogowski coil for EM210	3-phase multi function meters	Contactless power analyzers
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EM210 **ROG 4K** **WM12 DIN/WM14 DIN** **CPA050 / CPA300**

- 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, d. B (EN50470)
 - Voltage inputs: 3x230 (400) VAC; Current inputs: 5 A CT (AV version) or 0.333 V from CTV-xx sensors (MV version) or ROG4K coils (MV version)
 - Self-power supply
 - Pulse output 1, RS485 Modbus RTU, high speed (up to 115 kbps)
 - Sealable terminal covers
 - CE, cULus, MID (AV and PF version)
- Flexible current sensor (Rogowski coil) for EM210 (MV version)
 - Primary current from 20 to 4000 A
 - Secondary output 100 mV/kA
 - 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
- Dimensions: 6 DIN modules
 - Installation: DIN-rail
 - 3 red LED displays
 - Measurement of voltage, current, power, power factor and frequency, energy (WM14)
 - Energy metering, 9 digits, d. 2
 - Measuring inputs: 230 VAC, 5 A
 - Power supply: 90-260 VDC/AC
 - Pulse or relay outputs
 - RS485 Modbus
 - CE, cULus
- CPA050 63x46x25 mm (without connectors)
 - CPA300 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 (CPA050: ø 15 mm hole, CPA300: ø 33 mm hole)
 - True RMS AC and DC monitoring
 - Voltage range: 800 VAC, 1000 VDC
 - Current range: CPA050: 50 AAC, 50 ADC CPA300: 300 AAC, 400 ADC

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Energy management

Monitoring gateway and controller	USB dongle connection modules	Long range wireless gateways	Cloud solution for multi-site monitoring
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UWP 3.0 **SH2 DSP24** **UWP A / UWP M** **Em² Server**

- Micro PC with embedded Web-Server
 - Data and event logging from Modbus, Modbus/TCP and Duplicine® devices
 - Local gateway functions (to BACnet and Modbus/TCP)
 - Remote gateway functions (FTP, SFTP, FTPS, Rest-API)
 - Microsoft Azure Certified for IoT
 - Huge ecosystem of compatible meters, sensors, actuators
 - Flexible control functions
 - Energy efficiency monitoring
 - Building automation control
 - Car parking guidance
- 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
- 2-DIN modules
 - Long range wireless, LoRaWAN® (UWP A)
 - 868 MHz ISM band (Europe)
 - Power supply 24 VDC, 115-240 VAC
 - CE, LoRaWAN Certified™ (UWP A)
 - Converts RS485 meters into IoT devices (UWP A)
 - Works in combination with the UWP 3.0 monitoring controller (UWP M)
 - Compatible with most Carlo Gavazzi meters and analyzers (UWP A)
 - Compatible with UWP A (UWP M)
 - Plug and play commissioning via UCS Software (UWP A)
 - Up to 50 UWP A each UWP M
- Software 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 or UWP 3.0

Pulse counter with wireless M-Bus output	M-Bus and wireless M-Bus concentrators	Quick-fit 3-phase energy transducer	Pulse counter concentrator + extension
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SIU MBC **SIU MBM-01 / SIU MBM-02** **ET272 + VMU C EM** **VMU MC / VMU OC**

- Dimensions 105 x 27 x 60 mm
 - DIN-rail housing
 - Pulse counter (2 pulse inputs)
 - Wireless M-Bus output
 - Battery power supply
 - Indoor or outdoor installation (IP67)
 - 12 years battery lifetime
 - Compatible with SIU-MBM-02 concentrator
 - Wireless M-Bus T1 mode, 868 MHz
- Dimensions 95 x 71 x 60 mm
 - DIN-rail housing
 - SIU MBM-01: M-Bus input
 - SIU MBM-02: M-Bus and wireless M-Bus input
 - MODBUS TCP/IP output
 - Power supply from 15 to 21 VAC, from 18 to 35 VDC
 - Ethernet port
 - MBUS and Wireless M-Bus scan feature
 - SIU MBM-01: up to 20 M-Bus connectable devices
 - SIU MBM-02: up to 20 M-Bus connectable devices and 32 wireless M-Bus devices
 - SIU-MBM-01-160: up to 160 M-Bus connectable devices
 - Set-up by UCS software
- 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, d. 1
 - Inputs: 3 x 230 (440) VAC, 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
- Dimensions 1 DIN modules
 - VMU MC: 250 input (pulse counting or ON/OFF monitoring)
 - VMU OC: 350 input (pulse counting or ON/OFF monitoring)
 - VMU MC: MODBUS output
 - VMU OC: local bus connection to VMU-MC
 - VMU OC: 24 VDC power supply
 - VMU OC: local bus power supply
 - VMU MC: TCD display
 - VMU MC: modular solution (from 2 to 1150 inputs)
 - VMU OC: extension module for VMU-MC
 - Configuration by UCS Software
 - Compatible with Utility meters with SO output

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