

Em²-Server



Software solution for energy monitoring and electrical data analysis



Benefits

- **Ease of energy monitoring and electrical data analysis** thanks to a software-based solution.
- **Full stack solution.** Linux-based solution including operating system, database and web user interface.
- **Multisite data aggregator:** up to 100 remote installations.
- **Configurable account management:** different levels of user accounts and multiple languages available.
- **Ease of deploying,** either On-premises or in the Cloud.
- **One shot license:** no annual fees.

Description

Em²-Server is the extension of the Carlo Gavazzi range of energy meters and power analysers. It allows multiple users to access to information according to their profile through its web interface and to manage energy and electrical data from multiple sites. Data are delivered via Internet by UWP 3.0 and/or VMU-C EM devices connected locally to energy meters and power analysers. Data are also time-normalized, stored on a database and aggregated according to the needs. A set of analysis tools and reporting functions allows users to get the most profitable value from the measured data points.

Main features

- Compatible with any Carlo Gavazzi energy meter and power analyser, via local data aggregators (UWP 3.0 or VMU-C EM).
 - Compatible with any Modbus energy meter thanks to the UWP 3.0 Modbus Commander or the VMU-C EM Modbus Driver Editor.
 - Distributed as VMware® virtual machine, ready for use without any external database or software tool.
- Note: Carlo Gavazzi has not any technical or commercial agreement with VMware®.*
- Simple per-gateway licensing plan.
 - Robust relational database.
 - Account-based data access.

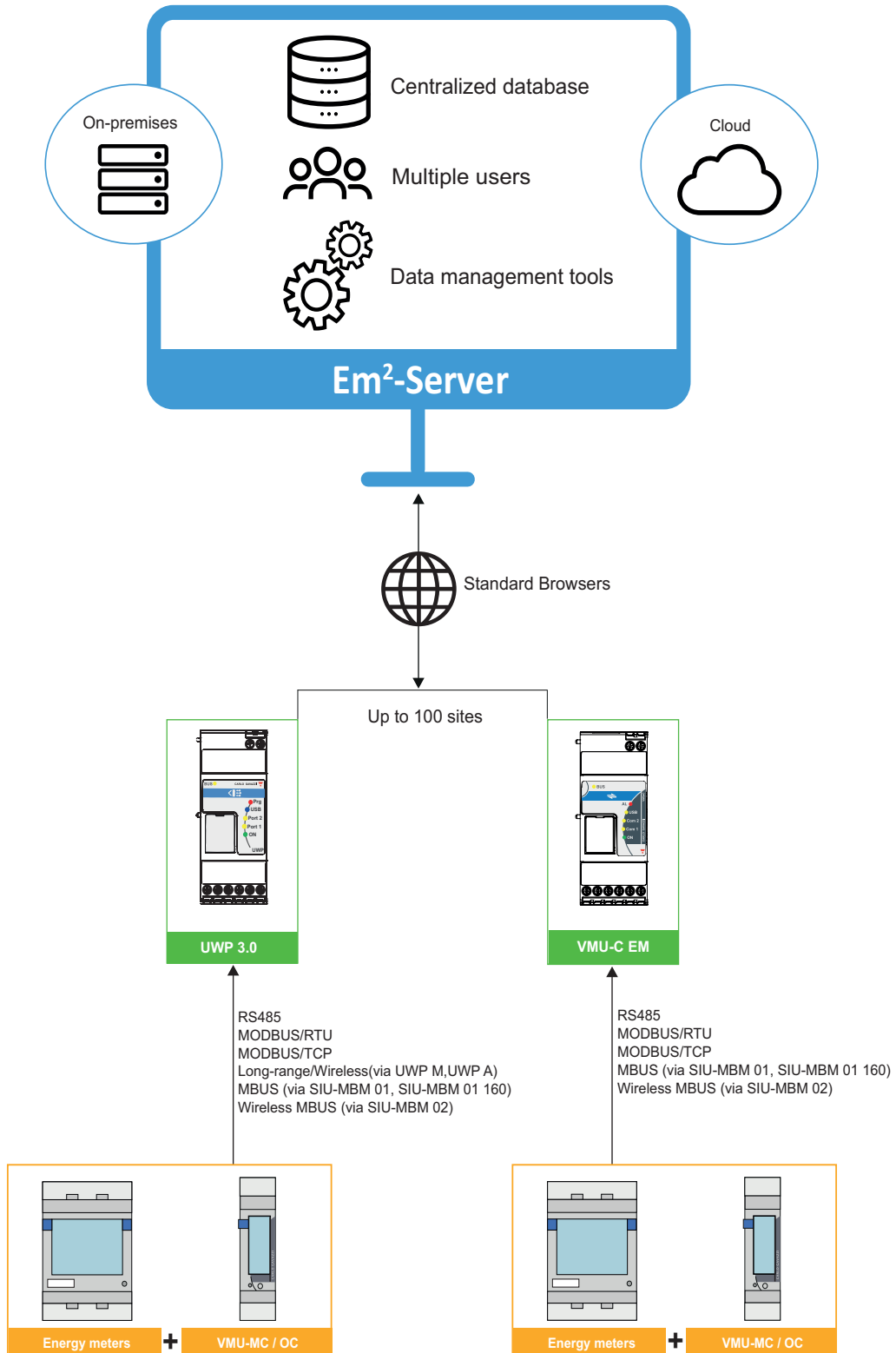
Main functions

- Data aggregation for analysis and reporting from up to 100 distributed sites.
- Compatibility with any Carlo Gavazzi energy meters and power analysers, via UWP 3.0 or VMU-C EM local aggregators.
- Virtual meters and virtual POD (point of delivery) creation.
- On-the-fly data aggregation: data are transmitted by UWP 3.0 or VMU-C EM and immediately processed.
- Multiple users.
- Multiple languages.
- Data analysis tools.
- Load profiling tool.
- Cost analysis and simulation.
- Excel® reporting with embedded Pivot Tables for offline analysis.
- PDF reporting with bill simulation for POD (point of delivery) analysis.

Content

- DVD with Em²-Server software, web-server functions, relational database distributed as OVF virtual machine for easy integration into VMware® environments
- License activation code (see **Em²-Server license** on page 5 for further details)
- Instructions sheet

Architecture





Software features

Deployment

| | |
|----------------------|-------------------------|
| Media | DVD |
| Format | OVF standard format |
| Compatibility | VMware® virtual machine |

Virtual machine's host characteristics

| | |
|------------------------------|---|
| CPU (min) | 64 bit (AMD Opteron / Intel Itanium) |
| RAM (min) | 8 GB (dedicated) |
| Free disk space (min) | According to portfolio size (100 GB for the bare virtual machine), suggested at least 500GB |
| Host operating system | VMware® compliant |

User interface

| | |
|--|--|
| Virtual machine installation | VMware® software tools |
| Network configuration | VMware® console access |
| Application software (administration) | Web-Browser |
| Application software (use) | Web-Browser |
| Web-Browser compatibility | Firefox, Chrome, Internet Explorer, Safari, Opera* |

*Note: Carlo Gavazzi tested Em²-Server with the latest versions of the named browsers (2014-April)

Backup

| | |
|---------------|--|
| Backup | Virtual machine backup and snapshot based on VMware® compliant backup tools* |
|---------------|--|

*Note: The user is responsible for data integrity and for putting in place any necessary action to grant that information are stored and managed in a reliable and safe way, including the necessary backup and disaster recovery procedures and solutions.

Em²-Server license

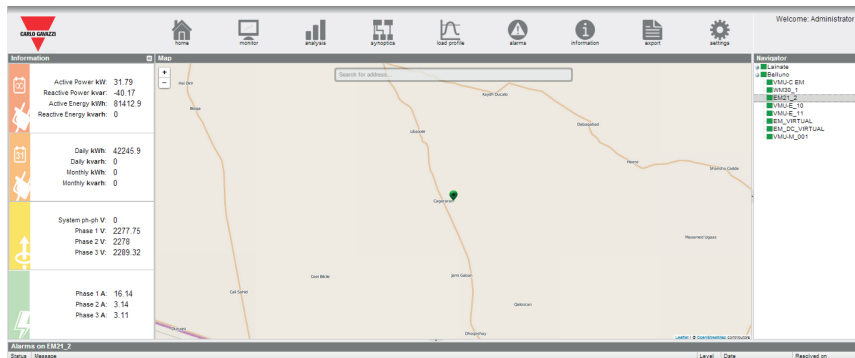
| | | |
|--------------------------|---|--|
| License structure | Base license: it allows activating the server instance to connect up to 20 VMU-C EM and UWP 3.0 units to the target server instance. | |
| | Base license extension: it allows extending the actual number of VMU-C EM / UWP 3.0 units. | |
| Necessary license | Managed VMU-C / UWP 3.0 units | License |
| | 20 | 1 base license |
| | 40 | 1 base license + 1 base license extension |
| | 60 | 1 base license + 2 base license extensions |
| | 80 | 1 base license + 3 base license extensions |
| | 100 | 1 base license + 4 base license extensions |
| License check | It is necessary a valid Internet connection with outbound communication on ports 80 and 443 to activate the Em ² -Server's license. Em ² -Server periodically and remotely checks the license validity with Carlo Gavazzi's license servers. If the license check is not possible or the result is not valid, the relevant Em ² -Server instance is disabled, and data pushed by VMU-C EM / UWP 3.0 units do not enter the Em ² -Server's database. | |

Communication

| | |
|-----------------|---|
| Protocol | Carlo Gavazzi DP (Data Push) protocol based on web-server communication |
|-----------------|---|

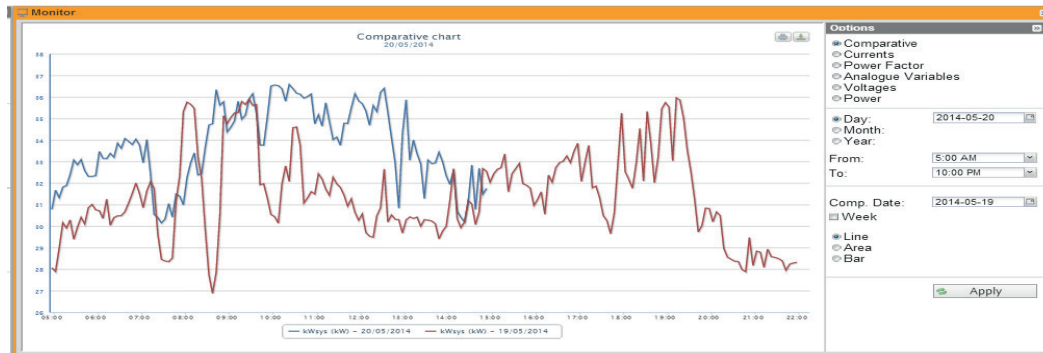
Web server

Main page



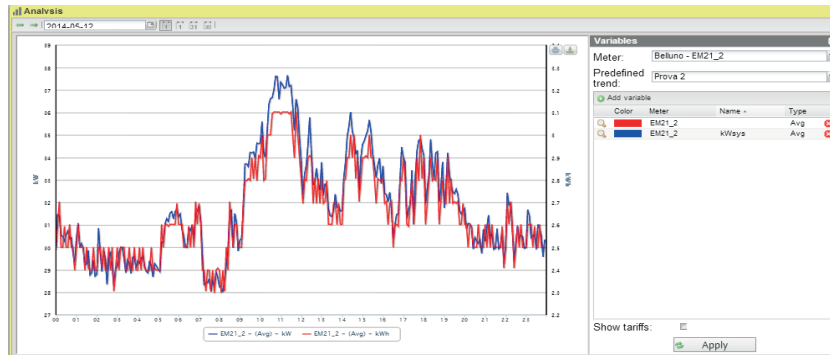
- Web-based access via standard browser.
- Multiple accounts.
- Configurable access rights for each user.
- Map for locating UWP 3.0 and VMU-C EM devices.
- Navigator tool for organizing the system in cost centres according to the needs.
- On-the-fly update of the whole database, during the reception of data.

Monitoring tool



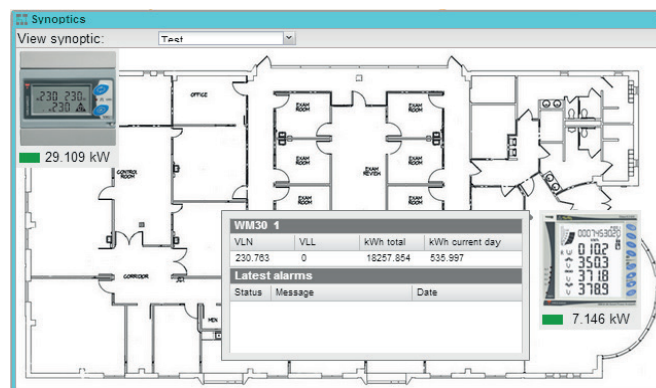
- Real time (according to sampling interval) and historical data displaying of each energy meter and power analyser variables.
- Easy navigation of available meters and cost centres.

Analysis tool



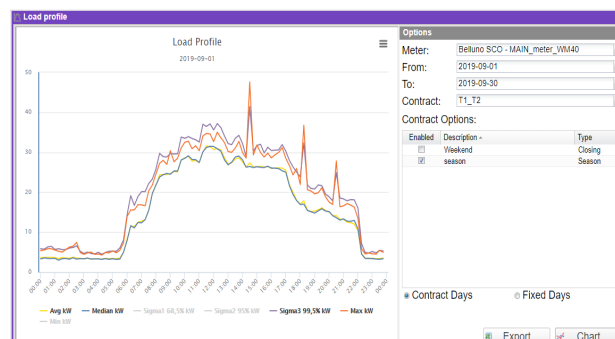
- Real time (according to sampling interval) and historical data displaying of any combination of variables.
- Comparison of trends in different time intervals.

Synoptic tool



- Real time (according to sampling interval) displaying of energy meters and power analysers on top of one or more layouts or schematics.
- Multiple panels can be managed.

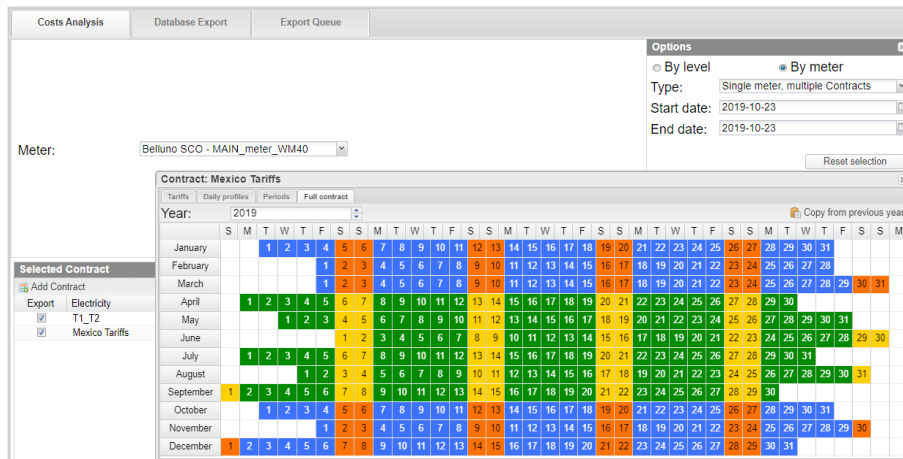
Load profile tool



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

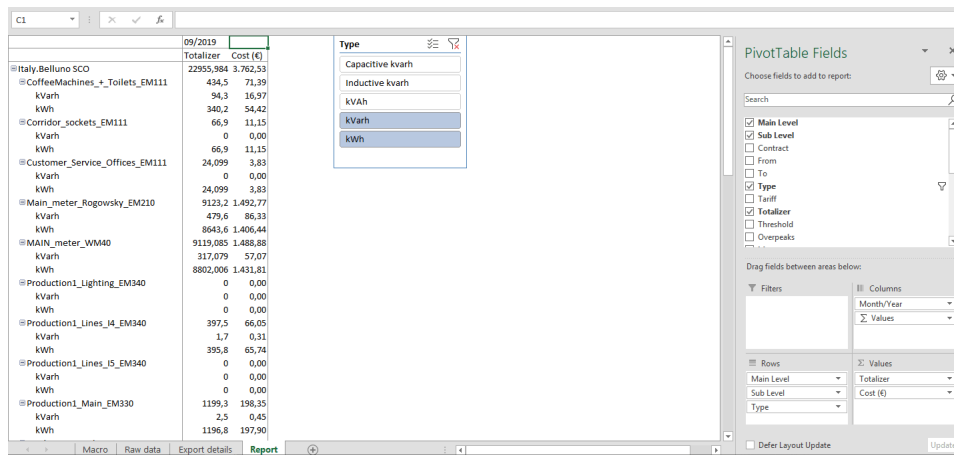
 Report

Tariff management



- Calendar and tariff settings for cost calculation.
- Multiple contracts management for cost simulation.

Excel reporting



- 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).

**Billing simulation report**

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STATEMENT DATE**13/03/2020****AMOUNT DUE****3,985.72 €****SERVICE ADDRESS**

CUSTOMER: Name
Address, City, (Zip Code)
Email
Phone Number

MEASUREMENT POINT**MAIN_meter_WM40****BILLING PERIOD**

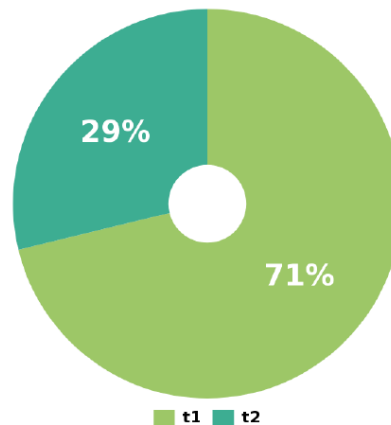
| DATE | kWh READING | kvarh READING |
|------------|---------------|----------------|
| 01/01/2020 | 959,990.5 kWh | 36,052.3 kvarh |
| 29/02/2020 | 979,789.1 kWh | 39,637.2 kvarh |

CHARGES DETAILS

| COSTS | QUANTITY | UNIT PRICE | SUBTOTAL |
|------------------------|----------------------|------------|-------------------|
| Active energy | | | |
| t1 | 13,578.4 kWh | 0.17 € | 2,308.32 € |
| t2 | 6,219.0 kWh | 0.15 € | 932.85 € |
| Total | 19,797.4 kWh | | 3,241.17 € |
| Reactive energy | | | |
| t1 | 3,297.5 kvarh | 0.60 € | 677.04 € |
| t2 | 2,398.3 kvarh | 0.18 € | 67.51 € |
| Total | 5,695.8 kvarh | | 744.55 € |

TOTAL CHARGES

Total **3,985.72 €**

kWh costs allocation

- PDF reports with custom templates containing calculated costs according to measured consumptions and contract of choice.
- Report split into user / cost centre (for a selectable group of devices).

References

Further reading

| Document | Where to find it |
|-----------------|--|
| User manual | www.productselection.net/MANUALS/UK/em2-server_eim.pdf |
| Software update | www.productselection.net/MANUALS/UK/em2-server_sw_download.pdf |

CARLO GAVAZZI compatible components

| Purpose | Component name/code |
|--|----------------------------------|
| Web server | VMUCEMAWSSUX |
| | UWP30RSEXXX |
| Energy meters and power analysers (families) | CPA |
| | EM24 EM26 |
| | EM210 |
| | EM111 EM112 EM330 EM340 |
| | EM270 EM271 EM280 |
| | ET112 ET330 ET340 |
| | WM20 WM30 WM40 |
| Pulse concentrator | VMUMCAS1I2EM VMUOCAI3XXEM |

How to order

**EM2SERVERSTD**

Enter the code replacing the symbol with the selected option (e.g.: EM2SERVER STD L1)

| Options | Description |
|---------|--|
| L1 | Base license (up to 20 VMU-C EM/UWP 3.0) |
| L2 | Base license extension (additional 20 VMU-C EM/UWP 3.0)* |

**Note: up to 100 VMU-C EM / UWP 3.0 can be managed by a single Em² -Server instance.*



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