EMS 100, 200: SAUTER EMS and EMS Mobile

How energy efficiency is improved

SAUTER EMS is the professional solution for displaying all types of energy consumption, identifies potential for saving energy and provides fundamental information for operating in a more energy-efficient manner and, therefore, more cost-effectively and competitively. Support is provided for the requirements of the ISO50001:2011 standard and energy audits according to ISO 50002 (EN 16247) for energy management systems and the guidelines for introducing them in companies.

Transparency and visualisation of energy consumption and CO_2 emissions

SAUTER EMS offers all the advantages of a state-of-the-art cloud solution. For example, energy management information can be called up at any time online, and reports can be sent automatically in a variety of formats.
As an alternative, EMS is also available as a licence solution for implementation in an existing IT infrastructure.
To provide an overview for company-wide energy management, maps of the various locations are available so that users can skip directly to the detailed views. These maps can also be defined as alarm overviews.
For optimised planning, SAUTER EMS provides forecast functions based on reference curves with calculated past values.
Measurement data is analysed and displayed in standardised reports or on portal pages that are available online and can be called up in a WEB browser via smartphones and tablets (iOS or Android), and via standard PCs and notebooks.
EMS Mobile is a smartphone and tablet app that provides optimised access to alarms and portal pages, as well as the option of entering meter readings online.

Features

- Energy data managed centrally for centralised and decentralised sites based on measurement data, key figures and reference variables
- EMS Mobile can optimise significantly manual data entry for meter reading rounds, and also ensures the data quality and that the data is available more quickly.
- Forecast functions based on reference curves, past data and formulae, as well as entry of future data point values
- Geographical maps can be assigned to any site, with direct links to detailed information and a general representation of alarms at the sites
- Standard reports for showing measurement data and comprehensive analysis options with scatter and carpet plots, as well as load curves, which are important components and prerequisites for various “Green Building” building certifications as per standards such as LEED, BREEAM, EnEV, MINERGIE, HQE, GreenCalc+, and for ISO 50001 company certification and ISO 50002 / EN 16247 auditing
- Logbook for documenting measures and entering comments and notes, in line with ISO 50001
- Displaying portal elements in external applications, including websites, PowerPoint presentations and Green Building Monitors
- Software Data Connector (SDC), including SSL functionality for building management systems such as novaPro Open, novaPro Enterprise, for SAUTER EMS Energy Data Logger (EDL, listed under “Accessories” for the products and their predecessor models), and for e-mail, SNMP (licence model only) and SQL
- SDC FTP data source for automatic import of CSV, XML, MSCONS and LPEX file formats with definable import interval
- Direct data acquisition (independent of SAUTER) through one or more SAUTER EMS Energy Data Loggers (EDL, listed under “Accessories” for the products and their predecessor models)
- Data acquisition, validation and automatic aggregation to daily, weekly, monthly and yearly values
- Entering and using time-dependent reference variables such as areas, operating and opening times, production times or high- and low-rate times
- Display of measurement data, reference variables and key figures as time series in diagrams for any periods
- Web-based graphic display of energy consumption including the basis for generating the energy performance certificate
- Web-based graphic energy consumption comparisons with standardised benchmarks
- Optional creation of reports directly using the report module integrated in the SAUTER EMS server

- Automatic sending of reports by e-mail
- Seamless integration into facility management systems[1)] possible as an option with SAUTER EMS server (charged separately)
- Allocation of consumption and costs to internal cost centres and third-party tenants. Optional connection of maintenance, CAFM and accounting systems[2)]

Technical description

- Alarm management
- Data point management
- Management of measurement data
- Aggregation (compression) of measurement data
- Forecast and reference module
- Comprehensive formula module
- Manual and automatic correction of measurement data
- Presentation of measured values
- Benchmarking
- Standard reporting (daily/weekly/monthly/yearly energy report)
- Creation and automatic export of the reports
- User administration
- Data export and import
- Configurable heating degree days

Technical data

Hardware		
	Processor	Dual-Core CPU 64-bit / x64-compatible
	Clock rate	> 2 GHz
	RAM	At least 4 GB RAM if the server is being used for EMS on a dedicated basis (2 GB must be used for VMware)
	Memory capacity	40 GB free HDD space for VM partition
Software		
	Operating system[3)]	VMware ESX(i) Server from 4.0 (recommended) or MS Windows 7 (x64), Windows 8.1 (x64), MS Windows Server 2008 (x64/from standard), Windows Server 2012 (VMware Workstation is required for MS OS)

EMS basic licence packages and user licences

Products	
Type	Description
EMS100F011	Basic system package including 10 data points (DP), 1 simultaneous user, 5 portal clients and an SDC for novaPro Open
EMS100F012	Basic system package including 10 DP, 1 simultaneous user, 5 portal clients and an SDC for EDL
EMS100F015	Basic system package including 10 DP, 1 simultaneous user, 5 portal clients and an SDC for novaPro Web
EMS100F016	Basic system package including 10 DP, 1 simultaneous user, 5 portal clients and an SDC for novaPro Entreprise
EMS120F011	(Sys) 1 additional simultaneous user (local user on EMS server)
EMS120F012	(Sys) 5 additional portal clients for accessing EMS Mobile and the Standard EMS Portal
EMS110F001	(Sys) each with 10 EMS DP from 11 to 30 DP
EMS110F002	(Sys) each with 10 EMS DP from 31 to 100 DP
EMS110F003	(Sys) each with 10 EMS DP from 101 to 200 DP

1) *The development of the function is*
2) *The development of the function is charged separately.*
3) *The SAUTER EMS server is supplied as a virtual machine (VMware)*

Products	
EMS110F004	(Sys) each with 100 EMS DP from 201 to 1000 DP
EMS110F005	(Sys) each with 200 EMS DP from 1001 to 2000 DP
EMS110F006	(Sys) each with 500 EMS DP from 2001 to 6000 DP
EMS110F007	(Sys) each with 1000 EMS DP from 6001 to 20000 DP
EMS111F008	(Sys) each with 5000 EMS DP from 20001 to 100000 DP
EMS420F001	(Sys) software maintenance contract (18% per year)
EMS110F999	Current software on DVD

Software Data Connector (SDC) options for data acquisition for various BMS, e-mail, FTP, SQL and SNMP systems

Options	
Type	Description
EMS140F001	(Sys) SDC for novaPro Open
EMS140F002	(Sys) SDC for novaPro Web
EMS140F005	(Sys) SDC for novaPro Enterprise
EMS140F009	(Sys) SDC for EDL
EMS140F020	(Sys) SDC for generic SQL for 10 data points (DP)
EMS140F021	(Sys) SDC for SNMP for 10 DP
EMS140F022	(Sys) SDC for e-mail (CSV, MSCONS, LPEX) for 10 DP
EMS140F023	(Host) SDC for FTP (CSV, XML, MSCONS, LPEX) for 10 DP
EMS140F025	(Sys) update DP for SDC e-mail, each with 10 DP from 11 DP to 100 DP
EMS140F026	(Sys) update DP for SDC e-mail, each with 100 DP from 101 DP to 1000 DP
EMS140F027	(Sys) update DP for SDC e-mail, each with 1000 DP from 1001 DP to 5000 DP
EMS140F028	(Sys) update DP for SDC SNMP, each with 10 DP from 11 DP to 100 DP
EMS140F029	(Sys) update DP for SDC SNMP, each with 100 DP from 101 DP to 1000 DP
EMS140F030	(Sys) update DP for SDC SNMP, each with 1000 DP from 1001 DP to 5000 DP
EMS140F031	(Sys) update DP for SDC SQL, each with 10 DP from 11 DP to 100 DP
EMS140F032	(Sys) update DP for SDC SQL, each with 100 DP from 101 DP to 1000 DP
EMS140F033	(Sys) update DP for SDC SQL, each with 1000 DP from 1001 DP to 5000 DP
EMS140F034	(Sys) update DP for SDC FTP, each with 10 DP from 11 DP to 100 DP
EMS140F035	(Sys) update DP for SDC FTP, each with 100 DP from 101 DP to 1000 DP
EMS140F036	(Sys) update DP for SDC FTP, each with 1000 DP from 1001 DP to 5000 DP

EMS basic hosting packages and user licences

Products	
Type	Description
EMS200F001	Basic hosting package including 10 data points (DP), 1 user and 1 SDC for novaPro Open
EMS200F002	Basic hosting package including 10 DP, 1 user and 1 SDC for EDL
EMS200F005	Basic hosting package including 10 DP, 1 user and 1 SDC for novaPro Web
EMS200F006	Basic hosting package including 10 DP, 1 user and 1 SDC for novaPro Entreprise
EMS210F001	(Host) each with 10 EMS DP from 11 to 30 DP
EMS210F002	(Host) each with 10 EMS DP from 31 to 100 DP
EMS210F003	(Host) each with 10 EMS DP from 101 to 200 DP
EMS210F004	(Host) each with 100 EMS DP from 201 to 1000 DP
EMS210F005	(Host) each with 200 EMS DP from 1001 to 2000 DP
EMS220F001	(Host) 1 additional simultaneous user (user access on host)
EMS220F002	(Host) 5 portal clients for accessing EMS Mobile and the Standard EMS Portal

Larger numbers of data points for hosting on request.

Software Data Connector (SDC) options for hosting for data acquisition for various BMS, e-mail, FTP and SQL systems

Options	
Type	Description
EMS240F001	(Host) SDC for novaPro Open
EMS240F002	(Host) SDC for novaPro Web
EMS240F005	(Host) SDC for novaPro Enterprise
EMS240F009	(Host) SDC for EDL

Options	
EMS240F020	(Host) SDC for generic SQL for 10 data points (DP)
EMS240F022	(Host) SDC for e-mail (CSV, XML, MSCONS, LPEX) for 10 DP
EMS240F023	(Host) SDC for FTP (CSV, XML, MSCONS, LPEX) for 10 DP
EMS240F025	(Host) update DP for SDC e-mail, each with 10 DP from 11 DP to 100 DP
EMS240F026	(Host) update DP for SDC e-mail, each with 100 DP from 101 DP to 1000 DP
EMS240F027	(Host) update DP for SDC e-mail, each with 1000 DP from 1001 DP to 5000 DP
EMS240F031	(Host) update DP for SDC SQL, each with 10 DP from 11 DP to 100 DP
EMS240F032	(Host) update DP for SDC SQL, each with 100 DP from 101 DP to 1000 DP
EMS240F033	(Host) update DP for SDC SQL, each with 1000 DP from 1001 DP to 5000 DP
EMS240F034	(Host) update DP for SDC FTP, each with 10 DP from 11 DP to 100 DP
EMS240F035	(Host) update DP for SDC FTP, each with 100 DP from 101 DP to 1000 DP
EMS240F036	(Host) update DP for SDC FTP, each with 1000 DP from 1001 DP to 5000 DP

Accessories	
Type	Description
EDL50F001	Energy Data Logger 50 for max. 50 DP, incl. M-Bus Master for 25 devices, without software
EDL50F002	EDL 50/55 software licence for 10 DP each for the EDL50 and EDL 55 GSM models, incl. driver for BACnet/IP, M-Bus and Modbus (IP/RTU), KNX IP
EDL55F001	Energy Data Logger 55 GSM for max. 50 DP with GSM module, incl. .....(same as EDL50..)
EDL1000F001	Energy Data Logger 1000 including 10 data points (DP) for data acquisition and drivers for BACnet/IP, M-Bus and Modbus (IP-RTU), KNX IP and DIN mounting kit
EDL1000F002	EDL 1000 update for each 10 data points (DP) from 11 to 100 DP
EDL1000F003	EDL 1000 update for each 100 DP from 101 to 1000 DP
EDL1000F004	EDL 1000 update for each 1000 DP from 1001 to 10000 DP

Summary of functions

EMS Mobile

EMS Mobile provides access to portals, alarms and a menu for entering meter values manually, optimised for smartphones and tablets. The access is activated via portal clients (PCL).

- Diagrams of the portals are based on Highcharts
- Alarms are displayed and can be acknowledged by entering information
- Manual entry option with time stamp and information for meter reading rounds, with direct data transfer to the EMS server
- Offline functionality for manual entry to temporarily save data when there is no GSM or Wi-Fi connection

Forecast and reference module

These modules can be used to create forecasts based on reference values (static or dynamic). These future values can be assigned different colours in the diagram to distinguish clearly between historical and forecast values.

Geographical maps

Geographical maps provide an overview of a company's individual buildings or premises. You can skip directly to detailed information on the maps, or the maps display information on unacknowledged alarms or particular KPIs.

Analysis functions

Scatter plot and carpet plot are analysis functions that enable energy managers to check schedules and user habits, for example, or the heating and cooling valve positions according to temperature. These functions are part of up-to-date and energy-efficient building operation.

Logbook function

The logbook records errors and irregularities and has a function for entering your own comments. Also, the definition, planning and implementation of measures can be recorded in the logbook. This information can also be assigned directly to diagrams or individual data points in order to build up a complete documentation history. These are very useful functions to support the process of certifying companies according to ISO 50001 and for auditing according to ISO 50002 / EN 16247-1.

Energy performance certificate

SAUTER EMS can be used to automatically calculate the energy performance certificate for the measured energy consumption and present it graphically. The necessary parameters for this, such as energy consumption areas, primary energy factors and emission coefficients, are saved as time-based reference variables
for a building or type of use. The SAUTER EMS server considers the specified different usage categories in a building. The energy performance figure and the greenhouse emissions (CO_2 emission) are calculated from the consumption measurements for each usage and each building.

Benchmarking

In the graphical evaluations, the values displayed can be simultaneously displayed and compared with official benchmark values.

Alarm management

A central website allows you to present the alarms and malfunctions for your properties within SAUTER EMS. This provides the hotline or the technical staff with a quick overview of the state of the technical installations on all properties.
Other functions:

- Displaying current or finished unacknowledged alarms
- Displaying the alarm history
- Acknowledgement of alarms/malfunctions by authorised users
- Documentation of comments and measures
- Time-related suppression of alarms

Data point management

Time-dependent reference variables such as areas, operating and opening times and usage can be stored for each property. Key figures are automatically calculated for the properties from the measurement data and its reference variables.

- Assignment to freely definable hierarchical data models
- Automatic uploading of data points of the SDCs with filter criteria
- Current status indication for data points
- Definition of manual entries
- Assignment of a manually entered value to a data point defined in a building management system (novaPro Open)
- Definition of virtual data points (a licence is not required) using formulas with basic mathematical operations
- Generation of formulas for all locations
- Definition of aggregation algorithms
- Configurable heating degree days

Management of measurement data

The consumption meters are mapped in hierarchical structures for each medium. It is also possible to set up logical links. The consumption values are calculated based on pre-defined formulas. However, the measurement data model is not only designed for mapping meters: any operating statuses of installations (e.g. temperatures, pressure, switch actions) can be managed. The measurement data is checked automatically based on the previous year’s values and predefined rules. Conspicuous outliers can be corrected manually. A change log is maintained for corrections.

- Automatic adoption of the measured values of the SDC or the EDL
- Manual entries with predefined sequence
- Plausibility check of manual entries by displaying and comparing the last entries
- Calculation of virtual data points
- Plausibility check of measuring ranges
- Entry of measured value corrections individually or over a time period
- Recording of causes for corrections

Aggregation (compression) of measurement data

The measured values are automatically compressed to daily, weekly, monthly and yearly values. Various algorithms, such as average-values, minimum, maximum, integration, are available for the compression.

- Compression to daily values
- Compression to weekly values
- Compression to monthly values

- Compression to yearly values
- Automatically or manually starting the compression

Presentation of measured values

- Tabular presentation of measured values
- Direct comparison of measured values
- Graphical presentation of measured values
- Diagrams with multiple curves
- Simultaneous presentation of multiple diagrams
- Zooming within diagrams
- Interactive display of measured values and times in a graphic
- Predefined or self-defined portal pages
- Special diagrams, such as a carpet plot, load curve, traffic light view

User administration

In the user administration, groups and users are defined with their access rights. The access rights are very flexible and can be divided among the individual modules and sub-functions. Access can also be assigned to different locations. Additionally, user administration includes the definition of the minimum requirements for the complexity of the user passwords.

Data export

The data export to CSV and Office files, such as an XLS file, is possible and is included in the basic package.
Interfaces for asset, CAFM and ERP systems are optionally available on request.

Portal-based and advanced reporting

Defined EMS portals can be sent directly as reports at any time. Additional evaluations can be generated with an integrated reporting tool (BIRT), which enables both graphical and tabular custom presentations of measured values and key figures. This tool also enables drill-down functions. Both portal-based reports and reports created with BIRT can be sent automatically by e-mail via an SMTP server with or without authentication.

Time series

Measurement data, reference variables and key figures can be presented as time series in diagrams for any desired periods. For example, load profiles for the power consumption can be presented for individual or multiple properties.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the «Summary of functions» section.
All related product documents must also be adhered to. Modifications to the product are not permitted.

Disposal

Data media must be disposed of in accordance with the relevant laws, separately from domestic waste. Please take them to an official collection point.
SAUTER is keen to ensure that all health and environmental regulations are complied with during recycling.

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