

YCS 320...325: Vision Services

Vision Services: Powerful, efficient energy and building management from the cloud

SAUTER Vision Services are comprehensive, powerful modules from the SAUTER Cloud for energy monitoring, building management and energy management and analytics. The centralised approach of cloud operation means that the latest functions and extensions are always available for all building and energy management applications, without the need for time-consuming installations and migrations.

Additionally, it saves the investment costs in hardware and software and shifts these investments and their support to the cloud. IoT clients are used to securely transfer local energy and automation data by means of the MQTT protocol with TLS encryption.



Features

- Vision Services Energy Monitoring with dashboards, diagrams, energy navigation, meter overview with correction and offset functions for meter replacement, alarms, reports and data import and export management
- Vision Services Building with dashboards, diagrams, alarms, object lists, scenario manager, reports and export function
- Vision Services Energy Management & Analytics with additional diagrams for energy and plant analysis such as SANKEY, carpet & scatter plots. Histogram plots with Gaussian distribution function and analytics functions for automatic detection of operating pattern deviations, setpoint deviations and oscillations. All Vision Services Energy Monitoring functions are included.

All Vision Services can be booked individually or in combination. For example, Vision Services Energy can be used to operate dedicated monitoring in the cloud that runs independently of the local building management. However, complete building and energy management with analytics from the cloud can also be booked as a subscription.

Overview of types

Type	Description
YCS320F200	Vision Services Building, subscription incl. 1 admin & 1 standard user, 1 MQTT client
YCS321F200	Vision Services Energy Monitoring, subscription incl. 1 admin & 1 standard user, 1 MQTT client
YCS321F210	Vision Services Energy Management & Analytics, subscription incl. 1 admin & 1 standard user, 1 MQTT client
YCS324F200	Object package 50 from 0...500
YCS324F201	Object package 100 from 500...1000
YCS324F202	Object package 100 from 1000
YCS324F220	Additional standard user
YCS325F010	Cloud Connection Service (project & user set-up) incl. 1 MQTT connection
YCS325F020	Additional MQTT connection per device
YCS325F400	Cancellation of project subscription; no option of single item cancellation

Description of operation

Dashboard

Dashboards are an entry page into the operation of the plant or as an overview page for key figures and graphics of different plants, buildings or combined premises. They can be configured individually. The energy dashboard in combination with the Vision Services Energy Monitoring module displays various key figures and graphics for the current and historical consumption display. Real-time values can be displayed by integrating Vision Services Energy Management & Analytics into the building management. Vision Services Energy Management & Analytics also adds a number of special widgets to the building library.

The layout of the design templates contained in the dashboard automatically adapts to the size of the screen or device (responsive design). Individual widgets can be freely arranged via drag & drop.

Custom widgets can be used for the energy management:

- Widget for multiple curves
- Energy widget



- Performance widget – gas, CO₂

Diagrams

- Real time (only for quick charts)
- Historical
- Comparison of different time ranges

The following standard diagrams can be selected:

- Line diagram
- Step line chart
- Bar chart
- Pie chart
- Combinations of the above diagram types

The Vision Services Energy Monitoring module additionally allows the following diagram types:

- Stacked bar chart
- Pie chart with multiple objects

Multiple layouts are available for the arrangement of the diagram widgets. Up to 16 series (objects) can be displayed in a widget. Each widget can display the objects as a diagram or a table. The quick chart function can be called directly from lists and plant schematics without additional configuration via the object information board. In addition, a quick chart can be converted to a standard chart with a single click. Diagrams and/or tables can be manually exported as PDF and CSV files. All documents can be used in a report.

Alarm and notification management

Vision Services manage all process-specific alarms as well as Vision Center-specific alarms and system messages. Alarm lists can be customised and personalised. Notifications can be sent via email. Alarm events can generate and transfer complete reports. Alarms can also be visualised in plant diagrams, object lists, alarm lists, in the menu bar, and via pop-ups. When an alarm is terminated or reset, a comment can be entered for this.

Alarm types

The following alarm types are available:

- System alarms generated by the building management system
- Alarms generated by connected substations
- Alarms generated by SVC modules, e.g. by the energy monitoring module

Alarm lists

The alarm lists can be filtered completely and easily:

- Filter by alarm type (plant, module, bus etc.)
- Filter by alarm priority
- Filter by connected bus
- Intelligent, automatic filters depending on variable, dynamic parameters
- Automatic filter by image

This makes it possible to create an alarm list for a specific department or building with just a few clicks.

Without further configuration, alarm lists automatically contain the following data:

- Current data of the selected filter
- Historical data of the selected filter
- Statistical data connected to the alarm events (top 5, frequency)

Depending on the user's rights, the following functions can be activated from all alarm lists:

- Acknowledge all types of status changes, if required
- Add comments
- Display alarm details
- Display historical data of an alarm
- Display statistics for a specific alarm
- Download a help document for this alarm so the operator can quickly see how to resolve the problem
- View a quick chart of the object affected by the alarm to see, based on the curve, why and for how long the object is affected by the alarm

- Display all the other objects of the bus or project that are linked to the object

Actions

For each alarm, it is possible to generate the following actions:

- Send a configurable email with alarm information
- Send predefined reports without restrictions, providing information not only on the consequences of alarms, but also on their causes

Collective alarms

A collective alarm can be defined to combine the status of a building, floor or plant in a single alarm. This collective alarm is treated like a Vision Services alarm and benefits from all functions of an alarm. In addition, the acknowledgement of this alarm can confirm the active alarms of the group via a distribution command. Alarm statistics are automatically calculated and created for each alarm.

Energy alarms

In order to monitor energy consumption accurately, it is possible to add dedicated alarms. These alarms are related to the different aggregation levels. In this way, it is possible to simultaneously monitor hourly, daily or weekly consumption. The number of additional alarms that can be created is unlimited. These dedicated alarms contain all the features of the Vision Services standard alarms in terms of display or forwarding.

Scenario manager

Vision Services include a scenario manager integrated in the main system. This allows the system operator to configure sequential switching operations. This makes it possible, for example, to set rooms to Comfort or ECO mode at precise times according to the user's requirements. Starting, planning and changing scenarios or switching operations is carried out directly in the management and operating device and requires only basic PC skills.

The following functions are provided:

- Starting, planning, stopping and changing of scenarios
- Calendar overview of planned or executed scenarios
- Overview (history) with execution times and status information as well as detailed information in a separate log file
- Configuration of scenarios or switching sequences for an event date
- Switching times can be set between 24 hours before (preparation time) or 24 hours after the event
- Scenario modes such as ECO, Comfort or Normal can be freely defined
- The individual modes can be assigned a priority in scenarios
- A scenario can be stopped in the event of a malfunction

Vision Services Energy Monitoring

The Vision Services Energy Monitoring module enables the display and calculation of consumption values and shows both real-time and historical values. The energy dashboard displays various key figures for the energy consumption. The consumption values can be displayed as follows:

- Calendar, graphical and table views
- Line, bar or pie chart
- Numerical display

The "Data Management" menu gives you direct access to the following functions:

- Correct values
- Assign offset for meter replacement
- Start a recalculation, e.g. after correcting values. The corrections are made individually and for a previously selected area
- Import values and correct larger time ranges via CSV file import
- Task management module for an overview of various calculations

Other functions:

- Definition of meters for manually entering values and saving and displaying them
- Based on meter values, hourly, daily, weekly, monthly and annual consumption values are automatically calculated, stored and displayed
- Definition of alarm criteria for consumption values and custom alarm notifications
- Export of data for use in external systems (CSV/ PDF; manually or automatically by email)
- Recording and monitoring energy consumption
- Definition of limit values for notification

- Display of comparative diagrams for definable periods
- Mathematical calculations

Vision Services Energy Management & Analytics

The Vision Services Energy Management & Analytics module enables high-level analysis of the building's behaviour. The functions show the quality of the control and the energy losses, and display critical information in a simple form. In addition, real-time calculations trigger alarms that enable a quick response. It allows the use of analysis functions, special diagrams, and advanced calculation operators. It includes all the functions of the energy monitoring module.

The diagrams allow additional diagram types:

- SANKEY (flow chart)
- Carpet plot
- Stacked bar chart
- Scatter plot
- Pie chart with multiple objects
- Histogram

Calculations provide analytical functions and logical operators:

- Logical operators: AND, OR, NOR, XOR
- DEVIATION() (monitor signal deviation)
- COHERENCE() (monitor signal coherence to a pattern)
- Oscillation detection (count the oscillation over a predefined period)

Access to the data management and task management is a special function for this profile. It allows detailed management of the energy items.

- Force recalculation
- Add values manually
- Import files
- Replace meters

Reports

Reports can be created as follows:

- Manually
- Automatically in conjunction with a calendar
- At the beginning or end of an alarm

When creating reports, the following is possible:

- After creating a report, emailing it to predefined people
- Constant availability via the web interface for downloading

When downloading reports, it is possible to select one or more at a time and then download them together in a ZIP file. All documents in the system can be selected as part of a report. Reports exported by email or stored in the system memory are non-editable PDF documents.

Formula editor and calculations

Vision Services enable complex calculations. This option is available for the Vision Services Energy modules. Calculations can include all available objects and all aggregation levels can be used.

The following operators are available:

- Basic operators: +, -, ÷, ×, ()
- Logical operators: AND, OR, NOR, XOR
- Advanced operators: e.g. IF(), COS(), ...

The Vision Services Energy Management & Analytics module also includes the following analytical operators and objects:

- Operating pattern (Patterns)
- Deviation function (DEVIATION())
- Coherence function (COHERENCE())
- Oscillation detection

Lists of interactive objects

Vision Services provide lists of objects and display their current values. The following functions are available:

- The lists of data points are dynamic, thus the updated values are displayed automatically
- Binary and multi-state data points allow values to be displayed as states
- It is possible to open the historical curve of one of the data points

- It is possible to open a dynamic window (object information board) listing all documents and images for the respective data point, and to open these documents and images with one click
- For all data points for which a write operation is possible, manual control in overwrite mode and returning to automatic mode are possible via these lists
- Group filters for object lists are available for quickly finding one or more data points. For example, a pre-selection by object type, units or station is possible

User administration

The project has two groups of users:

- Administrator, who has the authority to administer the project
- User, who is a simple user of the applications

In addition, roles can grant access to some advanced functions such as the energy or scenario manager.

Export – import

Export

It is possible to export data in a neutral CSV format. Export rules can be defined for working with third-party tools. The export rules allow:

- Planned export via email

Import

The import function enables existing data to be integrated into Vision Services. It helps in the following cases:

- Transferring old data from previous systems or third-parties into Vision Services
- Correcting errors caused by incorrectly read data from meters

After importing this data, Vision Services calculate all aggregations in the past related to the imported data. Calculations that include this data are also recalculated to ensure data coherence over the entire period.

Invoicing model

The basic subscription includes two users, a project administrator and a standard user. However, it is possible to add additional users. It is possible to increase the size of the project to match the life cycle of the installation. Additional object packages can be added at any time. The packages are 50 and 100 additional objects. One MQTT connection is free in the basic package, but it is always possible to connect more devices by adding additional MQTT connections.

Schematic layout

To connect the existing devices to the Vision Services in the cloud, a gateway must be installed. This gateway uses the MQTT protocol to send and receive data. SAUTER ecos 504 and ecos 505 must be used to establish an MQTT connection to the Vision Services. Later, modulo 6 devices will also provide an MQTT connection.

Requirements

The gateway collects information about the existing devices from customers. This process is based on BACnet peer-to-peer communication and/or internal MQTT communication. Therefore, the plant information must be provided in BACnet/IP format or as an MQTT client. The SAUTER BACnet devices support a large number of peer-to-peer connections (200 per device), but this number must still be considered when refining the topology. In the case of internal MQTT communication, this limit is increased to 600.