

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 cost of investing in hardware and software and shifts these investments and their support to the cloud.

The communication protocols BACnet/SC, MQTT and OPC UA, which ensure a secure transmission of local energy and automation data through TLS encryption, are used for data communication to the cloud.

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, system images, diagrams, alarms, object lists, triggers, scenario manager, reports and export function
- Vision Services Energy Management & Analytics:
 - Additional energy and system analysis diagrams such as SANKEY, carpet plots and scatter plots with energy signature
 - Histogram plots with Gaussian distribution function and analytics functions for automatic detection of operating pattern deviations, setpoint deviations and oscillations.
 - Energy and system reports based on design templates and customer-specific specifications
 - Forecast data (manual, imported or calculated using historical data)
 - Energy reference line (baseline according to ISO 50001) and average calculations over specific years
- All Vision Services Energy Monitoring functions are included.

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

Overview of types

Type	Description
YCS320F200	Vision Services Building subscription, 2 groups, 2 users, one MQTT connection
YCS321F200	Vision Services Energy Monitoring subscription, 2 groups, 2 users, one MQTT connection
YCS321F210	Vision Services Energy Management & Analytics subscription, 2 groups, 2 users, one MQTT connection
YCS322F010	Vision Services subscription, a BACnet/SC connection
YCS322F020	Vision Services subscription, an OPC UA connection
YCS324F200	Vision Services subscription, 50 objects in the range of 0 to 500 objects
YCS324F201	Vision Services subscription, 100 objects in the range of 500 to 1000 objects
YCS324F202	Vision Services subscription, 100 additional objects in the range of over 1000 objects
YCS324F220	Vision Services subscription, 5 additional users
YCS324F221	Vision Services subscription, an additional group including 2 users
YCS325F010	Vision Services, cloud connection & setup service
YCS325F020	Vision Services, setting up an additional connection (BACnet/SC, MQTT, OPC UA)
YCS325F400	Vision Services, cancellation of subscription

Description of operation

Dashboard

Dashboards serve as an entry and overview page for key figures and graphs of various systems, buildings, floors and/or rental areas and rooms. They can be configured individually.



The energy dashboard, in combination with the "Vision Services Energy Monitoring" module, shows various key figures and graphs reflecting current and historical consumption, the resulting costs and CO₂ emissions. Vision Services Energy Management & Analytics provides additional graphs analysing system behaviour and energy flows. The analytics functions provide instant information about abnormal system behaviour, represented in dashboards with various widgets such as traffic lights, pointer instruments or alarm lists.

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 energy management:

- Widget for multiple curves.
Direct transfer of charts including axis labels and legends, as well as display of multiple line, bar or pie charts
- Energy widget.
Single widget for displaying individual energy values, calculations and aggregations
- Performance widget – gas, CO₂
Triple widget representing any three values of your choice, for example consumption, CO₂, last month, this week etc.

Charts

- 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

Selection of predefined time ranges, both fixed and relative.

Definition of time ranges (absolute or relative). Time ranges can be saved in the selection list for use in the entire system.

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 up directly from lists and 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 Services-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 system 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 (system, 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, sorted by frequency or alarm duration).

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 system 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.

Trigger function

The trigger function enables actions to be triggered automatically. The trigger conditions, such as time, values/thresholds or alarms, are monitored in real time. If a condition is met, one or more actions are performed, for example acknowledging or deactivating alarms, starting or stopping scenarios.

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 relating to the energy consumption. The consumption values can be displayed as follows:

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

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

- Correct values
- Delete 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 for an overview of various calculations
- Freely definable customer-specific time stamp format for use in data import

Other functions:

- Definition of meters for manually entering values and saving and displaying them
- Definition of meter types, including plausibility check and automatic deletion of incorrect values
- 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 of 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 detailed analysis of the building's behaviour. The functions illustrate the quality of control and energy consumption, 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 chart types and advanced calculation operators. It includes all functions of the energy monitoring module.

Additional chart types are also available:

- SANKEY (flow chart)
- Carpet plot
- Stacked bar chart
- Scatter plot
- Pie chart with multiple objects
- Histogram
- Forecast data (manual, imported or calculated using historical data)
- Energy reference line (baseline according to ISO 50001) and average calculations over specific years

Calculations provide analytical functions and logical operators:

- Logical operators: AND, OR, NOR, XOR
- DEVIATION() (monitor signal deviation)
- COHERENCE() (monitoring signal coherence to a pattern)
- Oscillation detection (counting the oscillation over a predefined period)
- Calculation and representation of energy signatures or regression lines in the scatter plot

Reports

Reports are created based on Vision Services documents. Predefined design templates can also be used with the Vision Services Energy Management & Analytics subscription.

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 functions and objects:

- Operating pattern (Patterns)
- Deviation function DEVIATION()
- Deviation from the operating pattern (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
- The symbols used to represent the priority array can be defined in a project-specific, manufacturer-specific (vendor) or device-specific manner. They are used in all views

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.

Multi-factor authentication

Authentication in Vision Services is carried out via a user name with password and a time-limited one-time password (OTP). This authentication method, which needs to be set up only once, significantly increases the security of your data and services in the cloud.

An authenticator app is required for multi-factor authentication (MFA), for example Microsoft Authenticator, Google Authenticator or NetIQ Advanced Authentication. The authenticator is installed on a separate user device, for example on their smartphone.

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.

Connectivity to Vision Services

The following protocols are available for connecting the local building automation, meter structures or individual sensors and meters:

- **BACnet/SC:** This protocol ensures encrypted data transmission at local sites. The modulo 6 automation stations and the modulo 6 BACnet router with integrated SC hub are available for the individual connections. The BACnet/SC protocol is ideal for building management and analytics applications, as it transfers full BACnet functionality with the appropriate properties (BACnet properties) to Vision Services.
- **MQTT:** When using this protocol, the modulo 6 or ecos 504/505 automation stations with MQTT client must always be selected. A cloud broker, available from various providers, is also required. The MQTT protocol is ideal for transferring meter values and connecting individual sensors.
- **OPC UA:** This protocol allows local OPC servers to be connected directly to Vision Services.

