1 System Description

1.1 Management Level Requirement

1.1.1 General

All information comes together at the management level. The management level is the graphical, interactive interface for the operator to the automation station and the integrated plants and plant parts. System operation must be based on a simplified approach. The operator can display, query, process, save, or print any plant information via the peripheral units at the management level.

The plants are displayed in synoptic images and the values and states are presented and displayed dynamically. Special programs are used for higher control, optimization functions, maintenance and energy management.

Specified products: Siemens / Desigo CC or similar

1.1.2 Smart System for Smart Building

The building management system must be an accredited solution according to the following programs to be used as a Smart System for Smart Buildings.

- WiredScore, Accredited Solution
- UL SPIRE - Smart System Rating Program, Certification

Specified products: Siemens / Desigo CC or similar

1.1.3 Scada Platform

The building management system must be based on a SCADA platform that is compatible with the BACnet revision 20 and the B-XAWS (Cross-Domain Advanced Operator Workstation) profile. It must permit integration of any building installation including HVAC and lighting.

Specified products: Siemens / Desigo CC or similar

1.1.4 Multi-discipline

The building management system must be able to handle natively different disciplines in a building: Building Automation, Power Management, Fire Safety, Industrial PLC’s, Access Control, Intrusion, Video…

The disciplines must allow distribution across independent servers if required. Scope of access for controlling and monitoring discipline data must allow customization per user in every client station.

Each management station of the system must be able to be assigned one or more disciplines, allowing customizable single or multiple discipline access mode.

Specified products: Siemens / Desigo CC or similar

1.1.5 Drafted for Use by Fire Detection and Security Systems (UL certified)

The building management system must have passed Underwriters Laboratories (UL) performance and environmental tests.

The management station must offer all relevant functions to connect comfort and fire detection systems:

- Display and handle events
- Graphically monitor and control the fire detection system
- Highlight the highest priority events.

- Direct navigation to the element triggering an event.
- Quickly go to user-defined instructions and graphically display event locations.
- Save and query activity data from the fire detection system.
- Distribute fire monitoring and control capabilities.
- Provide operating instruction checklists for operators during stressful situations for handling fire events.
- Send automatic remote messages of impacted device per e-mail.
- Display and plan automatic history reports.

Specified products: Siemens / Desigo CC or similar

1.1.6 System Openness

The building management system must support standard protocols used in building technology, including:

- BACnet and BACnet/SC
- OPC DA (Data Access) and OPC UA (Unified Architecture)
- Modbus TCP
- SNMP
- KNX and KNX Secure
- S7, S7 Plus and S7 secure communication
- IEC 61850

Specified products: Siemens / Desigo CC or similar

1.1.7 Long Term Storage

The building management system must be able to store and archive data for a period of more than 10 years, allowing as an option segregation of stored data in different groups that can be tuned individually with different recording frequencies. Remounting of offline archived data must also be allowed.

Specified products: Siemens / Desigo CC or similar

1.1.8 Validated and Critical Environments

The building management system must allow compliance to regional certifications for validated environments, such as GMP Annex 11, US FDA 21 CFR Part 11 or similar. A special technical document verifying the compliance of the system in critical environments must be available.

Specified products: Siemens / Desigo CC or similar

1.1.9 Building Information Modeling (BIM)

The building management system must natively support Building Information Modeling (BIM) technology to perform the following actions:

- Display visual and data information from Building Automation components such as room controllers, field devices etc., in a 3D view.
- Display the 3D model of the building:
  - Allow operators to rotate, zoom in and zoom out the mode
  - Allow manual navigation through the 3D model, using the mouse cursor
  - Support simplified navigation with single mouse click to enter through doors, windows, and up/down staircases
  - Allow navigation from a system object via the browser to the associated equipment in the BIM view and vice versa
  - Allow selection of a BIM equipment and provide current (runtime) values and status properties. Commanding of objects shall be supported as well via the operating pane (such as switching on a light)

- Display 2D floor plan(s) of the building
  - Show the selected room in focus (zoom view)
  - Show various rom statuses as colored carpets
  - Show current room values (runtime values) directly on the floor plan
  - Allow selection of a room or a segment
- Display* room status in the 3D building view
  - Display the room operating mode (such as comfort, pre-comfort, etc.)
  - Display the presence detectors statuses
  - Display window states (open or closed) in a clear graphical format
  - Display the temperature status of a room
  - Display the lights' state
  - Display the positioning state of the blinds
- Provide a summary of all active events that are present on a selected area (such as a floor)
- Show the location of the building in Google maps (where applicable)
- Display the datasheet(s) and/or documentation of the selected equipment or field device, if relevant properties are present in the BIM data.
- Supported Data formats:
  - IFC4
  - IFC2x3

* Optimized for Desigo Room Automation

Specified products: Siemens / Desigo CC or similar

1.1.10 Automate Recurring Tasks

The building management system must take care of recurring tasks to lower the operator's workload.

This includes, for example, cyclical report generation triggering, plant release at various conditions, or automatic adjustment of setpoints or alarm limits.

Specified products: Siemens / Desigo CC or similar

1.1.11 Reactions

The building management system must allow automatically executable actions to be programmed at the management station when set conditions are verified.

Conditions can be time-based, event-based, on change of values or on a combination of some or all. When conditions are met, the system shall execute a pre-configured list of commands.

Specified products: Siemens / Desigo CC or similar

1.1.12 Scripting

The building management system must provide a Script Editor to create scripts based on a known scripting language. The script engine must allow the manual execution of scripts manually by the operator, or automatic execution triggered by the system based configurable conditions. Among others the scripts must support:

- Commanding of objects
- Reading attributes of object
- Subscription to value changes
- Read/Write text files
- Loading of external DLLs
- Mathematical / logical operations

Specified products: Siemens / Desigo CC or similar

1.1.13 System-wide Self-monitoring

The building management system must be capable of monitoring running applications, printers, and all connected subsystems. The system must report an event in case of an exceptional state.

Specified products: Siemens / Desigo CC or similar

1.1.14 System Analysis

Detailed analysis on system and user activities must be available in chronological order.

Specified products: Siemens / Desigo CC or similar

1.1.15 Help Function

The software must include an online help, context sensitive as well as indexed, a glossary, and can be searched by terms or sentences. The help content must be structured according to the following format: Engineering or Operating help.

Specified products: Siemens / Desigo CC or similar

1.1.16 Migration

The building management system must allow a smooth migration of an existing management station. Via its embedded software utilities, it must be able to accumulate existing graphic pages and Trend Objects or datasets, from a legacy management station to the new software.

Specified products: Siemens / Desigo CC or similar

1.2 Operating System for the Building Management System

All data servers, operator stations, etc., for the building management system must be compatible with the most current, generally available Microsoft Windows 64-bit operating system.

As a result, the current version of Windows (at least 6 months after release by Microsoft) as well as a minimum of the last Version is supported. Modifications to the customer network must be possible. The building management system must therefore be installable on any common PC or on tested embedded/industrial hardware and offer a multitasking environment where a user can run multiple applications simultaneously.

Specified products: Siemens / Desigo CC or similar

1.3 Product Lifecycle

The system provider must offer a transparent product lifecycle to ensure the required consistency. All equipment offered for this project must be contained in the current product portfolio.

The existing system environment must allow for easy and smooth integration of various devices and extensions.

Specified products Siemens / Desigo System or similar

1.3.1 Software Updates and Upgrades

The building management system must offer the possibility of software upgrades to the latest available version, in order to benefit from new features and from enhanced protection against possible cybersecurity threats.

This can be achieved by enabling a subscription to a software upgrade service, which must offer:

- Permanent protection against cybersecurity threats
- Availability of the latest software features (system and limits upgrade)
- Compatibility with the latest version of supported operating systems
- Support of the latest versions of the integrated subsystems

The building management system must support a centralized management of software updates and upgrades. It must provide a mechanism which allows for:

- Distributing the software from the server to all the connected machines (e.g., clients and FEPs)
- Running the software update and monitoring the progress of the update from the server on all the connected machines

Specified products: Siemens / Desigo System or similar

1.4 System Continuity

Products used must have a label for a global standard that ensures interaction with products from various manufacturers. Products with these labels can also be combined if manufactured at intervals of more than 10 years.

Specified products: Siemens / Desigo System or similar

1.5 Hardware Requirements

Embedded Hardware

Installation on an embedded hardware must be supported for small and / or mid-sized sites (1 server, up to 10,000 system objects). The hardware and software environment must fulfil the following minimal requirements:

- Type: Embedded
- Processor: Intel Celeron 6600HLE @ 2.10 GHz or equivalent
- Memory: 16GB
- Storage: 256GB SSD
- Network Card: Gigabit speed
- Graphics Card: Onboard graphics adapter with integrated processor
- Minimum Software environment:
- Win10 IOT Enterprise LTSC
- Microsoft SQL Server 2022 – Express Edition
- Network Requirements:
- Local network
- Single subnet
- 100 Mbps up/down
- Support Wake on LAN

Specified products:

- Siemens / Desigo CC Compact or similar
- Siemens SIMATIC IPC BX-32A or similar

Standard Hardware for small or medium plants

(Approximately 500-2000 data points)

One client/server system for mid-sized sites (up to 50,000 system objects, total: 1,500,000 in a distributed architecture) with a high data transfer rate is required. The hardware environment must fulfill the following minimal requirements:

- Type: Workstation Tower Format
- Processor:

  - Intel (e.g. Core Ultra 5 225, or equivalent) or
  - AMD (e.g. Ryzen AI Max Pro 385, or equivalent)
  - CPU Mark >= 13,000
  - Single Thread Rating >= 2,300
  - 4 cores on typical sites, 4 cores per running project in distributed systems on a single server (Segmented topology)
- Memory: 16GB
- Storage: 1 * 1024GB SSD
- Network card: Gigabit speed
- Client or Server stations that display video streams need to have a Graphic card (GPU) with min. 2GB RAM that supports hardware acceleration (e.g. Nvidia A400 or equivalent)

Network requirements:

- Local network
- 1000 Mbps up/down
- Latency less than 10 ms
- For the integration of XNET Fire Safety Systems, the server hardware needs to have a PCI slot for the NCC-2F card

Specified products: Siemens / Desigo CC or similar

Standard Hardware for large plants

(Approximately 2000-35,000 data points)

One client/server system is required for large sites(up to 150,000 system objects, total: 1,500,000 in a distributed architecture).
The hardware environment must fulfill the following minimal requirements:

- Type: Server 19” rack
- Processor:
  - Server-grade CPU like Intel Xeon (e.g. Xeon 6337P or equivalent) or AMD EPYC (e.g. EPYC 4244P or equivalent), designed for handling heavy workloads and multitasking, which meet the Windows Processor Requirements for the operating system installed
  - CPU Mark >= 13,000
  - Single Thread Rating >= 2,300
  - 4 cores on typical sites, 4 cores per running project in distributed systems on a single server (Segmented topology)
  - 6-8 cores on sites running large numbers of Advanced Reports (>1,000 daily), 6-8 cores per running project in distributed systems on a single server (Segmented topology)
- Memory: 32GB
- Storage: 1 * 1024GB SSD
- Network card: Gigabit speed
- Client or Server stations that display video streams need to have a Graphic card (GPU) with min. 2GB RAM that supports hardware acceleration (e.g. Nvidia A400 or equivalent)

Network requirements:

- Backbone Gigabit
- 1000 Mbps up/down
- Latency less than 10 ms
- For the integration of XNET Fire Safety Systems, the server hardware needs to have a PCI slot for the NCC-2F card
- IPV6 supported (NOTE: IPV6 for BACnet networks not supported)

- Standard secure mechanisms for DMZ, such as port forwarding, tunneling and redirection, PAT, NAT supported
- Hosting of the server in DMZ

Specified products: Siemens / Desigo CC or similar

1.6 Software Requirements

1.6.1 Operating System

The software must be compatible with the following Microsoft operating systems and editions:

- Microsoft Windows 10 64-bit (Enterprise and IoT Enterprise LTSC editions)
- Windows 11 (Pro, Enterprise and IoT Enterprise)
- Microsoft Windows Server 2019
- Microsoft Windows Server 2022
- Microsoft Windows Server 2025

1.6.2 SQL Server

The software must be compatible with the following Microsoft SQL products:

- Microsoft® SQL Server 2019 (Express, Standard and Enterprise)
- Microsoft® SQL Server 2022 (Express, Standard and Enterprise)

1.6.3 Microsoft Office

The software must be compatible with the following Microsoft Office products:

- Microsoft Office 365 (Standard, Small Business, Professional, Enterprise)
- Microsoft Office 2019 (Standard, Small Business, Professional, Enterprise)

1.6.4 Microsoft Power BI

The software must provide a connector that can share building data directly with MS Power BI, to support flexible data visualization, interactive dashboards, and reports.

1.6.5 Virtualization

The software must be compatible with the following virtualization software packages:

VMware®:

- vSphere 8.0 or higher

Stratus®:

- EverRun Enterprise v7.9.x or higher
- ztC™ Edge 250i: v2.3x or higher

Microsoft

- Microsoft Hyper-V 2019, 2022 and 2025

Nutanix

- Virtualization platform: Nutanix v6.5.x or higher

2 User Profiles

2.1 Individual Views

Individual, specific or user defined views must be adjustable for the plant overview. The views must cover various electrical and mechanical installations or follow geographic or organizational criteria and permit a customized, hierarchy view that depicts the management station, control systems, plant geographic layout as well as relationship of the mechanical facilities.

Specified products: Siemens / Desigo CC or similar

User Privileges

The building management system must allow users to define, change, or delete predefined reactions as per their user privileges.

Specified products: Siemens / Desigo CC or similar

Simplified Operator Interface

The building management system must allow operators to efficiently maneuver the controlled equipment. The navigation within system applications and components is achieved by tiles and via grouping of functionalities.

A simplified operator interface must be assigned to system users that require a simplified approach. The interface can be applied to more than one user. The following functionalities must be by default available for the system Operator:

- Managing of System Events (alarm management)
- Operate the installation via graphic application
- Navigate via tiles
- Time Scheduler
- Trend Viewer
- Log Viewer
- Report Application
- Document Viewer
- Notification

The operating interface must be documented by a workflow driven documentation that helps the operator to use the management station. The document shall be provided in PDF or online help format.

Specified products: Siemens / Desigo CC or similar.

2.2 Multilingual

Multiple languages must be supported in the same project configuration. Project data, as well as user interface texts shall be displayed in the language of the user who is logging on the system.

The user interface must support a minimum of 3 languages at the same time.

Specified products: Siemens / Desigo CC or similar

3 Graphics

3.1 Operating interface to CAD system

The user interface must allow users access to various system diagrams and floor plans using graphical depictions, menu selections, and data point assignments.

The graphics software must also permit the import of CAD symbols (DWG, DXF format) or scanned images for use in the system.

Specified products: Siemens / Desigo CC or similar

3.2 Operating Messages

Operating message must be able to be displayed and evaluated on the management level. Graphics must be able to display data point states that are overwritten by a local priority switch. This applies to data points designed for local override.

Specified products: Siemens / Desigo CC or similar

3.3 Full Graphics Mode

A fully graphics-based management level with ergonomic and freely scalable images must be available. The system must be developed to operating, monitor, optimize, and log all connected automation stations in real time.

Specified products: Siemens / Desigo CC or similar

3.4 Graphics Generation

Operators must be able to add, delete, and edit system graphics and state texts for digital data points from the standard user interface without external or special tools.

Specified products: Siemens / Desigo CC or similar

3.5 Navigation

A hierarchy tree can support as an option navigation to the various graphic images. Graphic displays must include the ability to dynamically zoom and switch among various layers with different information.

Specified products: Siemens / Desigo CC or similar

3.6 In-graphics Commanding

The building management system must offer graphic objects, which can be used to command or control the system. At a minimum, sliders, buttons, text boxes, drop-down lists and radio buttons must be included

Specified products: Siemens / Desigo CC or similar

3.6.1 Visualize the Quality State in the Plant Graphics

A violation of energy efficiency limit values for measured values of primary plants (e.g. centralized air handling, energy generation) must also be displayed in the plant graphic directly on the application components or function.

The parameters for monitoring, evaluating and forming the quality state can be set directly in the plant graphic based on read and write access rights. As an alternative: Make possible the simple navigation to an appropriate user program.

Specified products: Siemens / Desigo CC or similar

3.7 Graphic Symbols and Standards

Plant graphics must meet the ergonomic needs of the operator. The displayed graphic symbols must correspond to the generally valid standard for HVAC symbols (DIN EN 62424 (VDE0810-24)) and ASHRAE guidelines. The symbols must be supported as two- and three-dimensional graphics.

The ability is required to create colored floor displays and system diagrams for each mechanical facility including AHU, chilled water plants, hot water boiler systems, and room operator units. Associated printouts of standardized plant images must be added to the bid.

Specified products: Siemens / Desigo CC or similar

3.8 Object-oriented Graphics

The building management system must offer dynamic, high-resolution graphics. The graphics must be object-oriented. Each symbol must be able to display several states in the same, consistent format. At the same time, several views must be able to be open concurrently, and all views must be updated dynamically.

Specified products: Siemens / Desigo CC or similar

3.9 Continuous Update and Display

Measured values, setpoints, user settings, and alarms must be displayed immediately and continuously. State changes must be indicated via symbol, e.g. using animation or changing the color, in general, however, graphic presentation, or text.

Specified products: Siemens / Desigo CC or similar

3.10 Room Management

The building management system must provide a dynamic room re-assignment functionality according to the building needs. HVAC, lighting and shading functions can be re-assigned from the building management system directly in order to fit the new needs.

The following functionality is provided:

- HVAC functions, such as, FCU, VRV etc.
- Lights/blinds push-buttons
- Brightness/occupancy sensors
- Collision detectors, etc.

No other engineering or commissioning tools must be used to finalize the assignments.

Specified products: Siemens / Desigo CC or similar

3.11 Fire Brigade Maps

The building management system must provide a functionality for generating Fire Brigade Maps based on existing floor plans of the system. These maps must be designed to assist fire brigades by providing clear visual representation of fire detection zones, access routes, and evacuation paths. It must be possible to customize the maps with specific symbols and styles to meet various regional standards and requirements.

Specified products: Siemens / Desigo CC or similar

4 Energy Management

Energy and Power Management (EPMS) must be part of the Building Management System (BMS) software. More specifically:

- Operational and engineering data from EPMS must be in the same database as those of the BMS
- The energy management system must be certified in accordance with ISO 50001 and thus meet the international standard for energy management systems
- The following functions must use the same workflow, not requiring separate training or additional login:
  - Trending
  - Custom Graphics generation
  - Alarms management
  - Logs
  - User management with various authorization levels
  - Scripting
  - Help

Specified products: Siemens / Desigo CC or similar

4.1 Integration of Meters

The Energy and Power Management (EPMS) must be capable of integrating any meter or circuit breaker that has a known Modbus registry map.

The EPMS must be capable of integrating all types of meters like heating-, cooling, gas-, water-meters via protocols like Modbus, BACnet, OPC, SNMP, KNX .

The EPMS must allow the bulk import (integration) of many devices as well as import of individual devices.

The end user or engineer must be able to select for each meter or circuit breaker, which data points should be polled, displayed and, archived. Searching/filtering of the data point list must be available in order to help the process above to be more efficient.

For each data point there must be the option to have a high or low limit that will create an alarm if exceeded.

The EPMS must allow the organization of integrated devices in Hierarchical structure with areas and sectors where the devices belong.

Specified products: Siemens / Desigo CC or similar

4.2 Dashboards

The EMPS must have Dashboards that can show real-time data together with processed historical data. For example, real-time power demand and daily energy consumption of the last week on the same page.
Each device and each area must have its own dashboard and pre-made graphics showing basic characteristics and harmonics (if available from the device).

Specified products: Siemens / Desigo CC or similar

4.3 Virtual Devices and Calculations

The engineer/user must be able to create virtual objects and assign to them outputs of a calculation of existing datapoints. (For example, add power demand of device A and device B, and assign the output on a virtual point to get the total power demand of those devices.)

Specified products: Siemens / Desigo CC or similar

4.4 Libraries and Templates

The EPMS must use libraries to allow the easy transfer of data from one project to another. (For example, object models of custom-made meters or custom-engineered graphics.

The EPMS must have pre-made object models and graphics for measuring devices and circuit breakers as well as dedicated graphics symbols for other commonly used electrical components such as batteries, switches and UPSs.

Specified products:

- Siemens / Desigo CC or similar
- Siemens / SENTRON Measuring Devices 7KT/7KM PAC or similar
- Siemens / SENTRON Circuit Breakers 3VA/3WA/3WL or similar
- Siemens / SENTRON Embedded Micro Metering Module SEM 3 or similar
- Siemens / SICAM Power Meters P850/P855 or similar
- Siemens / SICAM Q100 Power Quality Recorder or similar
- Siemens / SICAM Q200 Power Quality Recorder or similar

4.5 Advanced Meter Management

The system must be able to detect energy meter rollover and react to it showing the real figure of the accumulated energy consumed. It must also support the exchange of energy meters and consider the latest reading of the replaced meter so that the energy values for the new meter continue adding up on it.

Specified products: Siemens / Desigo CC or similar

4.6 Energy and Power Reports

The EPMS must have reporting capabilities to process the acquired data.

The reporting engine must allow the scheduling of the report generation and emailing it as an attachment.

The following report templates must be available:

Load Duration

- Showing in Y axis the power and in X axis the time this power has been exceeded.
- Also showing the 50 highest reading in separate graph against the time of the day they occurred.

Top10

- Showing details about the top 10 energy consumers in the system.

Total Energy

- Showing the total energy consumption for selected points and period in Pie or Bar chart and compare across periods.

Standard

- Showing the readings in table format for the selected points from various devices.

Power Peak

- Showing the peak value per interval for a selected period against a predefined limit.

Load Variance

- Showing for the selected meter and time-period the power demand variation for all time intervals included in the period (overlay) as well as a separate graph the min, max and average values.

Energy Analysis

- Showing the Power demand for one whole year per month.

Cost Center

- Showing total energy and cost per cost center and medium with user definable cost per unit values.

Absolute Energy

- Showing the total energy consumption and its individual contributors in the stacked Bar or Area chart.

Sankey

- Showing the flow and distribution of energy

The system must be able to provide energy and power reports to visualize in addition:

- Load profiles
- Maximum power
- Energy consumption
- Comparison of consumptions
- Analysis of the data must be done at the local workstation and not in a cloud-based solution.

Specified products: Siemens / Desigo CC or similar

4.7 Hierarchical Reporting and Filtering

The system must allow the creation of a hierarchical structure for report generation. Every element belonging in the selected node must be included in the relevant report.

The system must allow every meter to be assigned into a category (e.g. electricity) and the report generation must allow filtering based on these categories.

Specified products: Siemens / Desigo CC or similar

4.8 Power Quality Meters

The system must allow the integration of power quality meters with the IEC61850 protocol.

In case a device generates a fault based on the waveform capture, the system must be able to download the file from the device for further analysis and storage. The system must be able to visualize Power quality data in reports according to the EN 50160 standard.

Specified products:

- Siemens / Desigo CC or similar
- Siemens / SICAM Power Quality Recorder Q100 or similar
- Siemens / SICAM Q200 Power Quality Recorder or similar

5 Scheduler Programs

5.1 Management via central Scheduler Programs

Operate all scheduler programs online from the management level to achieve consistent, transparent operation of all integrated systems and subsystems.

Specified products: Siemens / Desigo CC or similar

5.2 Scheduler Programs

The system must offer the ability to operate schedulers on automation stations as well as support management station-based time scheduling.

Each currently used plant image must offer user-friendly scheduler operation.

Specified products: Siemens / Desigo CC or similar

5.3 Scheduling and Override

Providing calendar type formats to simplify time and data planning and override building operation is required. Time definitions must be located on the PC workstation and building controller to ensure scheduling even if the PC is offline.

Providing override access through menus, graphical mouse, of function keys. Providing the following operations at a minimum:

- Comprehensive support of all BACnet objects for scheduler, calendar, and commands.
- Daily and weekly schedules
- Ability to compile multiple data points into a logical command group to simplify scheduling (e.g. Building 1 Lighting)
- Planning predefined reports.
- Ability to plan at least 10 years in advance.
- Provide filters for schedulers by name, time, frequency, and schedule.
- Provide sorting schedulers by name and schedule type.

Specified products: Siemens / Desigo CC or similar

5.4 Customized Scheduler Program

The user can customize the schedule defining the operating mode for each plant. Switching times are defined via weekly schedule. Overriding recurring weekly schedules via local or global exceptions as well as operation via any operator unit must be possible.

Specified products: Siemens / Desigo CC or similar

5.5 Customized Calendar

Local or global calendar exceptions must be able to override the plant-specific weekly scheduler program. Equal calendars must be assigned priority over each other. Calendar operation must be possible via all operator units.

Specified products: Siemens / Desigo CC or similar

5.6 Create Calendar online

Calendar programs must be able to be remotely created online to provide service personnel with a high level of flexibility.

Specified products: Siemens / Desigo CC or similar

5.7 Create Scheduler online

Scheduler programs must be able to be remotely created online to provide service personnel with a high level of flexibility.

Specified products: Siemens / Desigo CC or similar

5.8 Create Offline and Online Trends

Trend log objects, both offline and online, must be able to be remotely created in order to provide service personnel with a high level of flexibility. This action must be performed directly from the building management system, without accessing directly the automation layer.

Specified products: Siemens / Desigo CC or similar

5.9 Multiple, concurrent Users

Multiple users must be able to work concurrently on various workspaces on the building management system for efficient and comprehensive work. Plants must simultaneously be analyzed and e.g. monitored or operated via a remote station.

Specified products: Siemens / Desigo CC or similar

6 Security

6.1 Cybersecurity certification

The building management system must be implemented in accordance with the internationally recognized standards for industrial security ISA/IEC 62443, developed by the International Society of Automation (ISA) and adopted by the International Electrotechnical Commission (IEC).

- The provider organization must have secure development processes certified to IEC 62443-4-1 Maturity Level 3 (ML3) or higher.
- The building management system must be certified to IEC 62443-4-2 Security Level 2 (SL2) or higher.

Specified products: Siemens / Desigo CC or similar

6.2 Cybersecurity Guidelines

Cybersecurity guidelines must be available to support secure commissioning and deployment of the building management system. The guidelines must describe how the system needs to be configured to foster secure operation of the products and solutions in the intended operating environment. The cybersecurity hardening guidelines must be maintained throughout the product lifecycle.

Specified products: Siemens / Desigo CC or similar

6.3 Cybersecurity Penetration Test

Cybersecurity penetration test results based on Open Web Application Security Project (OWASP) Application Security Verification Standard for systems with sensitive data (OWASP ASVS Level 2) must be available.

Specified products: Siemens / Desigo CC or similar

6.4 Access Protection

Different people maintain and operate the plant. For this reason, passwords must be assigned to authorized persons to guarantee transparency for tracking or authorization purposes. A minimum of four different rights must be assignable.

- Administrator.
- Program and graphics creation.
- Operation to change or adjust setpoints.
- Guest.

Specified products: Siemens / Desigo CC or similar

6.5 Windows Authentication

The building management control system password management must meet the customer's IT guidelines. In other words, the customer's corporate standard also applies to the BAC system. Therefore, password management and the associated properties must comply with standard Windows log on and "track" the operator on each workstation.

Specified products: Siemens / Desigo CC or similar

6.6 Operating Functions

Central setpoint shift

The setpoints in the rooms must be adjustable and can be shifted for effective and clear room operation for the rooms as a whole and individually via the building management system.

Specified products: Siemens / Desigo System or similar

6.7 Alarm Function

The building management station contains an image of the physical data points. Each data point must be alarmable. Parameterization via operator units must be possible. The alarms either do not require acknowledgment, i.e. they come and go without acknowledgment, or must be acknowledged or reset and acknowledged.

Specified products: Siemens / Desigo System or similar

6.8 Alarm Message

Alarms from the automation station must be displayed on the operator units within 1 second. Alarms must be acknowledged or acknowledged and reset dependent on access rights. Delay times (e.g. feedback supervision, triggering of differential pressure monitor, filter) must be changeable via operator units.

Specified products: Siemens / Desigo System or similar

6.9 Alarm Suppression

During commissioning, plant servicing or automation station startup, it must be possible to suppress alarms and events from single objects or from entire plants. The suppression must include corresponding undesired reactions.

The building management system shall provide a clear indication in case of an active alarm suppression, and it shall easily be possible to list the suppressed objects.

Specified products: Siemens / Desigo System or similar

6.10 System Safety

High availability is expected from the building management system. This results in greater data availability, greatly reducing any down times.

Specified products: Siemens / Desigo System or similar

6.11 Alarm Generation

The building management system must be able to generate alarms based on events that are reaching the management station directly from the field level. The system must also provide a functionality for creating management station alarms that are configurable and satisfy the needs of event management, even for devices that are not supporting alarming natively.

Specified products: Siemens / Desigo System or similar

6.12 Message Handling

The building management system must support alarms generated at the automation level (substations).

Specified products: Siemens / Desigo CC or similar

6.13 Notification of Alarms

6.13.1 Media independent Formats

Current alarms may need to be routed independent of media at certain times to a central service (Email, SMS, pagers, and mobile apps).

The number of data points that can be configured for remote messaging of alarm conditions as well as the number of remote devices that may receive system messages may not be limited. The system must support the sending of encrypted e-mails.

Specified products: Siemens / Desigo CC or similar

6.13.2 Multi-level Alarm Escalation

It shall be possible that unacknowledged notifications can be forwarded to additional devices of the same person and/or different groups of people to ensure that notifications are received on time to react properly.

Specified products: Siemens / Desigo CC or similar

6.13.3 Exclude Recipients

The building management system must be able to exclude recipients, for example, when they are on vacation, so that when excluded, they do not receive any notifications.

Specified products: Siemens / Desigo CC or similar

6.13.4 Deactivate Notifications

Users can set Notifications to active/inactive to avoid e.g. sending out notifications from buildings where a subsystem change is ongoing, generating alarms which do not need to be forwarded by Email, SMS or Pager.

Specified products: Siemens / Desigo CC or similar

6.13.5 Import Recipients from Active Directory

It shall be possible that recipients can be imported/exported from/into CSV or XML formatted files. A regular automatic import of Active Directory import into the recipient DB shall be supported too. This helps to reduce the maintenance effort for recipients, when mobile numbers or email addresses change.

Specified products: Siemens / Desigo CC or similar

6.13.6 Message Optimization

In the situation of event related alarm bursts, the system shall avoid generating notification bursts to allow users to keep the overview in exceptional situations.

Specified products: Siemens / Desigo CC or similar

6.13.7 Enhanced Message Tailoring

The building management system must allow to tailor the notification message content and layout according to customer needs, using Java scripts for flexible tailoring.

Specified products: Siemens / Desigo CC or similar

6.13.8 Unicode UCS-2 Text Support

It shall be possible to use UCS-2 coding to send SMS texts for non-latin 2-byte characters used for Chinese-, Korean-, Cyrillic-, Arabic- and other -languages.

Specified products: Siemens / Desigo CC or similar

6.13.9 Dynamic Email Attachments

It shall be possible to add attachments to notifications sent out via email. The attachments can be static or dynamic. In the case of dynamically attachments, the attachment is dependent of the data point in alarm. For example, if a fire alarm needs to be notified, the corresponding email can have an attached graphic of the ground floor with the fire detector in alarm.

Specified products: Siemens / Desigo CC or similar

6.13.10 Graphical easy Buttons to trigger Notifications

The building management system must allow to send out notifications manually, using graphical buttons for triggering. These graphical buttons must be part of normal graphic pages (for example, campus, building and ground floor graphics).

Specified products: Siemens / Desigo CC or similar

6.14 Acknowledgment

Operator units for acknowledgement

All alarms (alarms and faults, errors) must be acknowledgeable after issue of individual rights from all connected workstations. For tracking reason, a time stamp and assignment (based on user account) is required.

This includes:

- Local acknowledgement (control cabinet, automation station)
- Management level
- Remote operating equipment

Specified products: Siemens / Desigo CC or similar

6.15 Alarm Management Strategy

The software must permit configuration of alarm management strategy for each data point. The editor provides a way to edit data points directly, online via the building management system.

The software for the user interface is also able to make batch changes to data point definitions and attributes to one or more data points selected by the user.

Specified products: Siemens / Desigo CC or similar

6.16 Colored Display of Alarms and Events

Incoming alarms must be colored for quick and easy interpretation. Both order and state, as well as alarm priority must be recognizable. The alarm window must be displayed as per operator needs. Alarm window displays must be added to the bid.

Specified products: Siemens / Desigo CC or similar

6.17 Alarm Message Content

The message texts must contain all information necessary to allocate and resolve the error. This includes at least the following attributes:

- Clear text
- Control cabinet name

- Plant name
- Priority
- Timestamp
- Time
- Status (acknowledged, unacknowledged).

Instructions on how to resolve the problem must be available in the background.

6.18 Informational Text and Object Memo

For each system object it shall be possible to configure texts with object specific information and instructions that must be displayed in case of an alarm. In addition, a memo can be attached to any system and used as a reminder or a note to operators.

Specified products: Siemens / Desigo CC or similar

6.19 Filter Alarms

The building management system must offer alarm filtering. Filtering must be possible by alarm lists or priorities.

Step-by-step instructions on handling each alarm help the building management system operator to find a solution.

Specified products: Siemens / Desigo CC or similar

6.20 Event Management

6.20.1 Event Routing and Sorting

Event messages can be displayed on each workstation in a table application and must include the following information: Name, value, event time and date, state, priority, acknowledge information, and alarm counter. The system must also be able to send out an acoustic message appropriate to the event category.

Specified product: Siemens / Desigo CC or similar

6.20.2 Even Message

Event messages can be displayed on each workstation in a table application and must include the following information on each event: Name, value, event time and date, state, priority, acknowledge information, and alarm counter. Each event must also be able to send out an acoustic message appropriate to the event category.

Specified product: Siemens / Desigo CC or similar

6.20.3 Event Acknowledgement

The user can acknowledge each event directly from the list, suppress the acoustic notification, print or delete it. The interface must also have an option to delete active, acknowledged events until it is reset to the normal state.

The user must be able to navigate to information associated with a data point, start an associated graphic or trended graphic diagram, or run a report for a data point selected directly from the event list.

Specified products: Siemens / Desigo CC or similar

6.21 Event Treatment

The building management system must provide multiple alarm-handling options. These are to be configured in alignment with the standard operating procedures.

Specified products: Siemens / Desigo CC or similar

6.21.1 Fast Treatment

The user must be able to acknowledge each event directly from the event list, suppress the acoustic notification, print or delete it. The interface must also have an option to delete active, acknowledged events until it is reset to the normal state.

The user must also be able to navigate to information associated with a data point, start an associated graphic or trended graphic diagram, or run a report for a data point selected directly from the event list.

Specified products: Siemens / Desigo CC or similar

6.21.2 Investigative Treatment

From the event list, operators shall have the ability to quickly focus on the source of the event, and all information (live and recorded video streams, recent history, schedules, and so on) related to the event source.

Specified products: Siemens / Desigo CC or similar

6.21.3 Assisted Treatment with Operating Procedures

The building management system must have the ability to program operating procedures consisting of a sequence of steps or actions, which the operator must perform. For each step of a procedure, the system shall provide instructions and operating tools. With appropriate permissions, a user shall have the ability to create, view, edit, or delete operating procedures.

Each operating procedure shall be composed of steps - some of which may be mandatory - for the user to complete (for example, view the graphic of the object in alarm, view live and recorded video streams, or complete an event handling form) while some others shall have the ability to be configured to be executed automatically by the system (for example, send emails to recipients or print on paper the information of the event).

Specified products: Siemens / Desigo CC or similar

7 Reports

7.1 Report Generation

The building management system must support the generation of spontaneous or predefined reports to provide important plant data at any time. The reports must be printable and exportable as a PDF file. The data must be able to be edited in other programs (Microsoft Excel or Microsoft Access) for further analysis.

Specified products: Siemens / Desigo CC or similar

7.2 Standard Report Templates

The building management system must support templates to generate detailed reports at little effort. At least three different report templates must be available by default.

For example:

- Report of records at given user defined time intervals
- Reports to record alarm and fault states
- Reports to record log entries
- Reports to record plant and control cabinet states.
- List of all current data points in an override state
- List of all disabled data points
- List of alarm strategy definitions
- Overall data point report
- Data point trend data listing
- Initial value report
- User activity report
- Event history report
- Generic report table

Specified products: Siemens / Desigo CC or similar

7.3 Customized Report Templates

The building management system must permit generated, specific reports as well as individual report templates that may include graphics and trend views.

Specified products: Siemens / Desigo CC or similar

7.4 Reports for project hand-over

The building management system must be able to create reports which provides the user with an overview of the project configuration. The reports must contain information about the most important system configuration like, basic project settings, data points and alarm configuration, networks, drivers, trends, macros, reactions, users, user groups and access rights, etc.

Reports must allow easy navigation between different sections e.g. navigate from users report to user’s groups and vice versa. It must be possible that these reports can be refreshed, backed up and viewed directly in the client application so that the users always have access to the most recent project configuration snapshot.

For change tracking purposes, it must be possible to run reports periodically by reactions and stored in a time-stamped Report Default Folder.

Specified products: Siemens / Desigo CC or similar

7.5 Reports and dashboards generation with Microsoft Power BI

The building management system must offer a connection to Microsoft Power BI with a set of reports templates and a dedicated editing functionality supporting reports creation and modification.

Specified products: Siemens / Desigo CC or similar

8 Remote Operation

8.1 User Requirements on Operation

It must be possible to remotely operate and engineer the building management system regardless of the location by means of different types of clients.

Remote clients must offer the same functionality as those on other workstations. All user functions must be available on installed clients, Windows desktop Apps, or HTML5-based clients via browser.

Appropriate Cybersecurity measures must be in place for remote operation.

Specified products: Siemens / Desigo CC or similar

8.2 Dedicated Desktop Installed Client

User must be able to remotely operate and engineer plants regardless of location. The client must operate as a fully installed software installation, locked with a desktop and prevents in this manner software from being minimized or hidden by other applications.

Specified products: Siemens / Desigo CC or similar

8.3 Windows App Client

User must be able to remotely operate and engineer plants regardless of location. Of course, this openness cannot place the plant security at risk. A Windows App must be loadable by the server PC on the client that operates like an installed application and is automatically updated as soon as new apps are available on the server.

Specified products: Siemens / Desigo CC or similar

8.4 HTML5-based Client

An HTML5-based client must be available to remotely operate the building management system. It must be able to run in a standard HTML5 web browser, on different devices, operating systems and browsers supporting keyboard and mouse operation as well as touch operation.

The HTML5-based client must be identified on the building management system via certificates. It must support the following login mechanisms to the building management system:

- Integrated user accounts, or
- LDAP users, or
- External OIDC provider(s)

The HTML5-based client must provide at least the following functionality for operation:

- Event management supporting fast and investigative treatment
- Notifications about new events or important system messages
- Monitoring and operation via graphic pages
- Commanding object properties
- Creation and analysis of trend data/trend records
- Configure and view schedulers
- View documents of types PDF, RTF, TXT and URLs.
- Generate and review reports
- View and filter historical log data

- Manage recipients for remote notifications
- Dark mode to ease work at night or provide higher-contrast display in artificial light.

User-specific and/or customized workspace settings must be automatically saved per user and for various screen sizes. Those settings must be automatically re-applied at the next session.

Specified products: Siemens / Desigo CC or similar

8.5 HTML5-based Desktop Application

An HTML5-based desktop application client must be available to remotely operate the building management system. It must be easy to download, install, and update, and must run on the supported Microsoft Windows operating systems of the building management system.

The HTML5-based desktop application must support multi-monitor environments and a closed mode based on the Microsoft Windows Kiosk Mode, which allows to create stations that are dedicated to the operation of the building management system.

Specified products: Siemens / Desigo CC or similar

8.6 Mobile App

An App, optimized for smart phones and tablets, must be available for the management. The App shall contain tools to see and command events as well as a System Browser to read and command all objects based on the security privileges of the operator as defined at the management station. The App shall be available for both Apple and Android operating systems.

Specified products: Siemens / Desigo CC or similar

9 Trend data

9.1 Trend Data Collection

The system must support the collection of trend log objects. Logging of those objects must be achieved according to the following principles:

- Using COV (change of value): every time the value is changing, a record is logged into the database
- Using time intervals: the record is logged into the database, given a specific and user defined time parameter (time filter).

The following time parameters must be supported:

- Default (no time filter applied)
- 30 seconds
- 1 minute
- 5 minutes
- 10 minutes
- 15 minutes
- 30 minutes
- 60 minutes
- 24 hours

Specified products: Siemens / Desigo CC or similar

9.2 Simultaneous, Multiple Trends

Multiple trend views must be possible simultaneously to provide a comprehensive plant overview. Standard plants from medium to higher complexity (as in this project) require a simultaneous display of up to 10 trend curves on the current page view to assess the plants. Multiple trend curves must thus be recorded at the same time.

Specified products: Siemens / Desigo CC or similar

9.3 Freely assign Trend Data

For the greatest possible flexibility, operators must be able to assign and thus record max. 4 additional data points individually for each plant.

The assignment must be carried out from the management station.

Specified products: Siemens / Desigo CC or similar

9.4 Decentralized Data Storage

None of the trend data may be lost during communications failure to achieve gap-free trend documentation. For this reason, all trend data must be created and saved to the automation station. After communications are restored, all values saved on the management station must be updated automatically.

Specified products: Siemens / Desigo CC or similar

9.5 Record History Data, Trend

Vital data points and setpoints must be saved for each building services plant. The polling time is oriented to the signal type, i.e. analog values are recorded cyclically while digital or multistate values are recorded by event.

Specified products: Siemens / Desigo CC or similar

9.6 Intermediate Storage of History Data

Trend data are collected in the automation station and transferred to the management level after a specific time has expired or a specific amount of data has been recorded. Trend data may not be lost if the management station is unavailable temporarily.

Specified products: Siemens / Desigo CC or similar

9.7 Trend Comparison

The system must offer a time adjusted trend view to run analysis of changed conditions at various times.

Specified products: Siemens / Desigo CC or similar

9.8 Trend Calculations

The system must allow simple calculations between trend data. A special trend calculation workspace must be used to configure the necessary elements for the calculations. The calculation workspace must at least offer:

- User defined descriptions for the trend calculation objects
- Fixed names for each individual trend object
- Mathematical operations, such as + , - , / , * , (), sqrt(), ^
- Align the trend data in a common timestamp with interpolation

The calculations must be presented in the form of reports or can be extracted in XLS for further analysis with external tools.

Specified products: Siemens / Desigo CC or similar

10 Communication

10.1 Interfaces

The building management system must be extendible to ensure long-term operation and provide all standard interfaces commonly available on today's market.

Specified products: Siemens / Desigo System or similar

10.2 Fire Detection System, BACnet-based

BACnet-based fire detection systems supporting BACnet BIBB AE-LS-B as well as objects LifeSafetyPoint and LifeSafetyZone as per the PICS (Protocol Implementation Conformance Statement) document must be able to be integrated for best deployment of a building management system. The following functions must be supported:

- Alarms and events from the fire detection system must be identified clearly and unambiguously.
- Signaling device states must be displayed as per the BACnet standard.
- Instruction texts must be able to be added to detectors and zones.
- Situational and floor plans as well as dynamic symbols must be used for visualization.
- A technical hierarchy, e.g. building, building part, zone, detector, must be provided to the operator for ease of operation.

Specified products: Siemens / Desigo System or similar

10.3 OPC

The building management system must be able to integrate and edit OPC data, and yet supply real time OPC data as an OPC server. System processing must include alarming, trend, scheduler, reporting, and be able to communicate with other devices.

The OPC interface must be tested and certified by the OPC Foundation certification program.

The system must support the OPC specification:

- OPC Data Access (DA)
- OPC Unified Architecture (OPC UA)

Specified products: Siemens / Desigo CC or similar

10.4 IEC 61850

A native integration with an electrical power network via IEC 61850 protocol must be supported.

Specified products: Siemens / Desigo CC or similar

10.5 Modbus

The management station must support communication to Modbus TCP/IP devices and sub systems directly from the management station.

Specified products: Siemens / Desigo CC or similar

10.6 KNX

The management station must support native communication to KNX devices, via KNX/IP protocol through KNX IP Routers, or KNX IP interfaces and gateways.

Specified products: Siemens / Desigo CC or similar

10.7 Standard BACnet / AMEV

10.7.1 DIN EN ISO 16484-5 / AMEV

AMEV (Management station) AMEV Profile MBE-A and MBE-B

The management station must meet AMEV profiles MBE-A and MBE-B as per AMEV guideline "BACnet 2011" V1.1.

Specified products: Siemens / Desigo CC or similar

10.7.2 BACnet Standardized Device Profiles

The building management system must be BTL certified for the following BACnet standardized device profiles:

- BACnet Cross-Domain Advanced Operator Workstation (B-XAWS)
- BACnet Advanced Operator Workstation (B-AWS)
- BACnet Advanced Life Safety Workstation (B-ALSWS)
- BACnet Advanced Access Control Workstation (B-AACWS)
- BACnet Router (B-RTR)
- BACnet Broadcast Management Device (B-BBMD)

They must also support BACnet data points and BACnet personal safety security zone functionality. The BACnet protocol revision must be at least 20.

The building management station must support seamless integration of alarming with BACnet devices, full support for commanding, writing and COVs to provide control and command functionality.

Finally, the system must support discovery and display of BACnet devices and all object types of BACnet protocol revision 20.

Specified products: Siemens / Desigo CC or similar

10.7.3 BACnet Secure Connect (BACnet/SC)

The building management station must support the BACnet/SC standard and allow:

- Support for any type of BACnet vendor using BACnet Secure Connect
- Support for dual network deployment (e.g., both SC networks and BACnet standard networks can be deployed)
- Handling of certificates for BACnet/SC
- Support for certificate notifications (e.g., Certificate expiry)

Specified products: Siemens / Desigo CC or similar

10.7.4 BACnet Engineering Data Exchange (EDE)

The building management station must support the import of engineering data, such as data point types, data point addresses and special data point presentation information from an EDE file that complies with the format described in the document “Description of the EDE Data Fields“, Version of Layout: 2.3, from the BACnet Interest Group Europe (BIG).

Specified products: Siemens / Desigo CC or similar

10.7.5 Video Status and Commands

The building management station shall be able to provide video controls with:

- Remote Control of Video Monitors
- VMS triggers for controlling logic in the VMS and triggering reactions in the building management system
- Video Events and Video Event Treatment including video tagging with alarm information
- Diagnostic information of Video Devices
- Video as Operating Procedure step

Specified products: Siemens / Desigo CC or similar

10.8 Building Automation and Control System – Industrial Devices

Integration of Simatic systems

A native integration of Siemens SIMATIC (S7 300/400/1200/1500) and S7 PLUS must be supported, including S7 secure communication.

Specified products: Siemens / Desigo CC or similar

10.9 Northbound Interfaces

10.9.1 Expose Information via OPC

The system must be able to supply real time data from the management layer, as an OPC server, and to integrate with third-party applications when necessary.

The system must support the OPC specification:

- OPC data access (DA)

Specified products: Siemens / Desigo CC or similar

10.9.2 Expose Information via BACnet/IP

The system must be able to supply real time data from the management layer, as a BACnet/IP server, enabling communication and integration with third-party applications and systems, when necessary.

The following specifications must be met:

- The system must expose a system object as Analog, Binary and Multistate BACnet object
- The system must support of read, write and change of value (COV)
- The system must be able to expose management station trends as BACnet trend log objects
- The system must be able to expose BACnet alarms
- The system must be able to expose at least 20’000 objects per running server

A BACnet Protocol Implementation Conformance Statement (PICS) must also be available.

Specified products: Siemens / Desigo CC or similar

10.9.3 Expose Information via SNMP

The system must be able to supply real time data from the management layer, as SNMP agent, allowing Network Management Systems (NMS) to monitor all Building Automation, Danger Management, Energy and Control System devices connected to the management platform.

The system must support:

- SNMP V2 protocol
- SNMP V3 protocol
- SNMP traps
- SNMP get

Specified products: Siemens / Desigo CC or similar

10.9.4 Expose Information via Cloud

The system must be able to connect to a cloud-based BMS platform, that allows cloud-based SaaS applications to access data of the on-premises system and execute the following tasks:

- View the high-level status of a single or multiple sites
- View the current value of datapoints
- Command/override on-site datapoints
- Visualize events/alarms coming from one or multiple sites in a unified and consolidated view
- Visualize aggregated information at different levels based on datapoints values or event information
- Visualize energy consumption information based on meter data
- Access the BMS user interface with single sign-on and simplified security deployments
- Onboard BMS sites as an application to get an understanding of what is installed on-premises

The systems cloud connectivity must include the following features:

- **Site onboarding process and configuration**
  The system must provide a simple engineering workflow to onboard the server hosting the system as a device and register the application represented by the systems project.
- **Selection of data to expose to the cloud-based SaaS application**
  As not all data of the system are relevant for a cloud overview, the system must provide a mechanism to do a selection of data to be uploaded and gives visibility from the cloud-based SaaS application only to the required data.
- **Data points and events from the cloud-based SaaS application**
  Datapoints and equipment that are uploaded to the cloud for a given site can be monitored, and for some of them, depending on the datapoint's nature, commanding / override is also possible. Datapoint values previously uploaded can be consulted using a Trend View. Events associated with the uploaded datapoints are reflected in the cloud-based SaaS application as well and aggregated to the level of equipment and site.
- **Remote tunnel access to the systems**
  If the overview given in the cloud-based SaaS application is not enough and the user needs to drill down into more details for a specific site, it must be possible to establish a tunnel to the system and use the local Client UI for more advanced operations.

Specified products:

- Siemens / Desigo CC or similar
- Siemens / Building X Operations Manager or similar
- Siemens / Building X Energy Manager or similar
- Siemens / Building X 360° Viewer or similar

10.9.5 Expose Information via Web Services

The system must allow external applications to read and write real-time data as well as access events or historical values, by using the provided REST (Representational StateTransfer) web service interfaces.

Web Services can be used for applications such as Enterprise Software, Energy Management services, Facility Management systems or Mobile Apps.

Specified products: Siemens / Desigo CC or similar