

Enterprise Server

EcoStruxure Building Operation

EcoStruxure™ Building



Introduction

An EcoStruxure BMS server is the core of the system and performs key functionality, such as control logic, trend logging, and alarm supervision. The Enterprise Server is the Windows application version of an EcoStruxure BMS server that collects site-wide data for aggregation and archiving, yet is flexible enough to run stand-alone applications. The Enterprise Server also serves as a single point of administration through WorkStation or WebStation for the EcoStruxure BMS, Schneider Electric's intelligent Building Management System.

Features

The Enterprise Server is a central point in the EcoStruxure BMS architecture from which users can configure, control, and monitor the system.

Semantics

Enterprise Server and Enterprise Central come with built-in support for modelling of the “digital twin” of the building, site, campus, and region using Brick Schema. WorkStation and WebStation provide enhanced human understandability through the additional context that is given to alarms and points through the “digital twin”. The required graph database is included in the installation packages. WorkStation can be used to create the model, or it can be imported using the graph database user interface.

Enterprise Server

Networking powerhouse

The Enterprise Server can run multiple control programs using a variety of protocols. It can manage alarms, users, schedules, and trend logs. Data from the Enterprise Server can be delivered directly to the user or to other EcoStruxure BMS servers and field devices throughout the site or enterprise.

Global view of the system

The entire site, including all of the automation servers and their associated devices, can be accessed and configured through the Enterprise Server.

This overview of the site provides easier mass change engineering and data analysis. The Enterprise Server also aggregates the event and alarm data from all its associated automation servers. Trend logs can be aggregated through the use of extended trend logs.

Text and graphics-based programming tools

Unique to the industry, the EcoStruxure BMS servers have both Script and Function Block programming options. This flexibility helps assure that a suitable programming method can be selected for the application.

Centralized alarms and data management

Alarms from multiple devices throughout the site, including automation servers, are collected by the Enterprise Server for centralized logging, display, and management. Users can also view event logs and trend logs from multiple servers.

The Enterprise Server hosts the historical and configuration databases. These databases store current information, including trends, alarms, user activity, and property information. Alarms can trigger email, SNMP, file, or client notifications, which can include alarm, point value, or trend log data. Notifications can also be triggered periodically by schedules or other binary values.

EcoStruxure BMS servers can be configured to automatically store all historical data, trend log data, event log and audit trail data, in an external database. If data needs to be available for longer periods of time, an external log storage can be incorporated into the EcoStruxure BMS without the need for extensive engineering work. The supported databases are TimescaleDB, which is built on PostgreSQL, and Microsoft SQL Server. The data in the external log storage is available natively to the viewers built into the EcoStruxure Building Operation clients and to the built-in reporting functionality.

You can use the powerful Log Processor functionality for custom processing of trend data for viewing in charts, dashboards and for inclusion in reports. The Log Processor enables advanced calculations on one or multiple trend logs and point values.

Examples of advanced calculations:

- Energy usage normalization
- Virtual submeters and summaries
- Calculation of Mean Kinetic Temperature
- Unit conversions
- Average, maximum, and minimum over custom periods

The output of the Log Processor can be saved in the database, including the External Log Storage or calculated automatically on demand.

From EcoStruxure Building Operation version 5.0.3 and later, selected trend logs and the event log can be sent to AVEVA PI System directly without the need for intermediate storage or specialized PI System connectors.

Reporting

The EcoStruxure BMS servers provide built-in functionality for basic reporting that can deliver reports in any text format and XLSX, without any dependencies to other external software. Reports for XLSX can be enriched by using advanced functionality such as formulas, conditional formatting, charts and sparklines.

Reports can be generated on schedule, on an alarm event or other custom conditions, and you can get the output delivered via email or written to file.

Using Enterprise Server and Enterprise Central, reports can be converted to PDF, and you can elevate the data security and traceability even further by using the optional add-on for automatically signing PDF reports with a digital certificate upon generation. This validates that the content has not been altered after the report was generated.

Authentication and permissions

An EcoStruxure BMS provides a powerful permission system that is easy to manage, flexible, and adapts to all kinds of system sizes. The permission system provides a high standard of authentication. Authentication is done against the built-in user account management system, against Windows Active Directory Domains, or via SAML 2.0 single sign-on. The built-in account management system allows an administrator to establish password policies that meet stringent cybersecurity guidelines. When Windows Active Directory or SAML 2.0 authentication is used, the administration costs are lower because users do not have to be managed in multiple directories.

Advanced activity log

It is important to log more than basic activity. In an EcoStruxure BMS, every action is logged with a timestamp, the user who performed the action, and the values that were changed.

Enterprise Server

WorkStation/WebStation interface

Through any client, the user experience is similar regardless of which EcoStruxure BMS server the user is logged on to. The user can log directly on to an Enterprise Server to engineer, commission, supervise, and monitor the automation server as well as its attached Central IO modules and field bus devices. For more information, see the WorkStation and WebStation specification sheets.

Open building protocol support

One of the cornerstones of the EcoStruxure BMS is support for open standards. The Enterprise Server can natively communicate with three of the most popular standards for buildings: BACnet (including BACnet/SC), LonWorks, and Modbus.

Native BTL-listed BACnet support

The Enterprise Server communicates directly to BACnet/IP networks. The Enterprise Server is BTL-listed as a BACnet Building Controller (B-BC), the most advanced BACnet device profile, and as a BACnet Operator Workstation (B-OWS). This capability provides access to the full range of BACnet devices from Schneider Electric and other vendors. See the BTL Product Catalog for up-to-date details on BTL listed software revisions on BACnet International's home page. The Enterprise Server can also serve as a BACnet Broadcast Management Device (BBMD) to facilitate BACnet systems that span multiple IP subnets.

BACnet/SC (Secure Connect) support

The Enterprise Server and automation servers support BACnet/SC applications as a BACnet/SC node, hub*, and router. This allows the Enterprise Server and automation servers to be in BACnet/SC networks and support applications that connect BACnet/IP or MS/TP networks with BACnet/SC networks. A major benefit of BACnet/SC is that it allows more secure transport of BACnet traffic and information between BACnet/SC devices over private and public networks without the need for BBMDs, VLANs, and VPNs, because the BACnet/SC protocol uses WebSocket technology and TLS 1.3 encryption. In addition, BACnet/SC uses certificate management to help ensure only those devices authorized to be on a BACnet/SC network can operate on that network.

* EcoStruxure Building Operation version 4.0.3 and later.

Native LonWorks support

The Enterprise Server works with a range of LonTalk adapters to communicate to TP/FT-10 LonWorks networks. Integrated LonWorks functionality enables access to LonWorks devices from Schneider Electric and other vendors. LonWorks networks can be commissioned, bound, and configured from the Enterprise Server using the built-in LonWorks Network Management Tool. No third-party tools are needed. To increase ease of use, LNS device plug-ins are supported. This allows for easier engineering and maintenance of LonWorks devices from

Schneider Electric and other vendors. There are some limitations on how LNS device plug-ins can be used.

Native Modbus support

The Enterprise Server and automation servers natively integrate Modbus RS-485 client and server configurations, as well as Modbus TCP client and server. This allows full access to third-party products and the range of Schneider Electric products that communicate on the Modbus protocol, such as power meters, UPS, circuit breakers, and lighting controllers.

Web Services support

The Enterprise Server supports the use of Web Services based on open standards, such as SOAP and REST, to consume data into the EcoStruxure BMS. Use incoming third-party data (temperature forecast, energy cost) over the Web to determine site modes, scheduling, and programming.

EcoStruxure Web Services support

EcoStruxure Web Services, Schneider Electric's Web Services standard, is natively supported in the EcoStruxure BMS servers. EcoStruxure Web Services offers extra features between compliant systems whether within Schneider Electric or other authorized systems. These features include access to semantic model, system directory browsing, read/write of current values, alarm receipt and acknowledgement, and historical trend log data. EcoStruxure Web Services requires user name and password to log on to the system.

MQTT IoT protocol support

The Enterprise Server and automation servers support MQTT as an option for publishing data to, and receiving updates from, other systems. MQTT is a messaging transport protocol that with its small footprint, light bandwidth utilization, and simplicity, is ideal for M2M and IoT communication. The MQTT capability supports communication with any MQTT broker, for example, Amazon, Microsoft, Google or IBM.

IT friendly

The EcoStruxure BMS servers communicate using the networking standards. This makes installations easy, management simple, and transactions more secure.

Supported Protocols

- IP addressing
- TCP communications
- DHCP for easy network configuration
- DNS for simple lookup of addresses
- HTTP/HTTPS for internet access through firewalls, which enables remote monitoring and control
- NTP (Network Time Protocol) for time synchronization throughout the system

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- SMTP or SMTPS with support for SSL/TLS based authentication, enables sending email messages triggered by schedule or alarm
- SNMP enables reception of application alarms in designated network management tools
- WebSocket Secure (WSS) and TLS 1.3 encryption (BACnet/SC applications)

TLS support

Communication between clients and the EcoStruxure BMS servers, and between EcoStruxure BMS servers, can be encrypted using Transport Layer Security (TLS). The servers are delivered with a default self-signed certificate. Commercial Certification Authority (CA) server certificates are supported to lower the risk of malicious information technology attacks. Use of encrypted communication can be enforced for both WorkStation and WebStation access.

Specifications

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Hardware requirements

Processor power, memory, and storage capacity should be scaled upwards to accommodate targeted system size as impacted by the total quantity of automation servers and expected historical archiving. Enterprise Server is tested on many different servers with varying configurations. The typical configuration is an 8-core 3.6 GHz processor, 32 GB of memory, and SSD storage capacity of 1 TB.

Processor

Minimum: Intel Core i5 @ 2.0 GHz or equivalent
Recommended: Intel Core i5 @ 3.0 GHz or better

Memory

Minimum: 4 GB
Recommended: 8 GB or higher

Storage capacity

Minimum: 100 GB
Recommended: 1 TB

Storage device

Recommended: Enterprise Solid State Drive (SSD)
An Enterprise SSD is recommended to maintain the necessary speed and stability. The database and the binaries should both be installed on the Enterprise SSD.

Other devices

Microsoft mouse or compatible pointing device is required.

Software requirements

Operating systems

Microsoft Windows 10 (64-bit)
Microsoft Windows 11^a
Microsoft Windows Server 2012 R2 (64-bit)
Microsoft Windows Server 2016
Microsoft Windows Server 2019
Microsoft Windows Server 2022^a

The following Microsoft Windows 10 editions are supported: Pro and Enterprise.

The following Microsoft Windows 11^a editions are supported: Pro and Enterprise.

The following Microsoft Windows Server 2012 R2 editions are supported: Datacenter, Standard, Essentials, and Foundation.

The following Microsoft Windows Server 2016 editions are supported: Datacenter, Standard, and Essentials.

The following Microsoft Windows Server 2019 editions are supported: Datacenter, Standard, and Essentials.

The following Microsoft Windows Server 2022^a editions are supported: Datacenter, Standard, and Essentials.

a) EcoStruxure Building Operation version 4.0.2 and later

Required additional software

The Microsoft .NET Framework is required by Software Administrator.

Microsoft .NET Framework 4.7.2 and later

External log storage PostgreSQL option

TimescaleDB 1.2 and later
PostgreSQL version compatible with the TimescaleDB version

Quality assurance testing has been performed by Schneider Electric with TimescaleDB and PostgreSQL installed natively in Windows 10, Windows Server 2012, 2016, and 2019. Other deployment scenarios have not been tested by Schneider Electric.

External log storage Microsoft SQL option

The following Microsoft SQL Server editions are supported: Enterprise, Standard, and Express.

Microsoft SQL Server 2016 SP1 and later

External log storage AVEVA PI System option

PI Web API 2021 SP3 and database compatible with that version
Quality assurance testing has been performed by Schneider Electric with PI Web API 2021 SP3, and database compatible with that version, installed on Windows Server 2019. Other deployment scenarios have not been tested by Schneider Electric.

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Communication

TCP	Binary, port fixed, 4444
HTTP	Non-binary, port configurable, default 80
HTTPS a) Disabled by default.	Encrypted supporting TLS 1.3, 1.2, 1.1 ^a , and 1.0 ^a , port configurable default 443
WSS ^a a) BACnet/SC applications	Encrypted supporting TLS 1.3, port configurable
SMTP	Email sending, port configurable, default 25
SMTSPS	Email sending, port configurable, default 587
SNMP	version 3 Application alarm distribution using trap
NTP	Time synchronization
BACnet	BACnet/IP, port configurable, default 47808 BACnet/SC, port configurable, no default port BTL B-BC (BACnet Building Controller) ^a BTL B-OWS (BACnet Operator Workstation) ^a

a) See the BTL Product Catalog for up-to-date details on BTL listed firmware revisions on BACnet International's home page.

Supports the following LonTalk adapters:

NIC709-PCI
NIC709-USB
NIC709-USB100
NIC709-IP
NIC852

Other protocols may be used for particular additional functionality. See Technical Documentation.

LNS

LNS version Installed on WorkStation PC	OpenLNS
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LonMark

Resource files version	14.00
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Part numbers

Enterprise Server - 10, EcoStruxure Building Operation Enterprise Server license for a PC server, includes support for 10 automation servers, 3 concurrent clients, and 1 semantic database limited to 2 CPU cores	SXWSWESXX00010
Enterprise Server - 50, EcoStruxure Building Operation Enterprise Server license for a PC server, includes support for 50 automation servers, 3 concurrent clients, and 1 semantic database limited to 2 CPU cores	SXWSWESXX00050
Enterprise Server - 100, EcoStruxure Building Operation Enterprise Server license for a PC server, includes support for 100 automation servers, 3 concurrent clients, and 1 semantic database limited to 2 CPU cores	SXWSWESXX00100
Enterprise Server - 250, EcoStruxure Building Operation Enterprise Server license for a PC server, includes support for 250 automation servers, 3 concurrent clients, and 1 semantic database limited to 2 CPU cores	SXWSWESXX00250

Upgrade software bundles

Enterprise Server Upgrade – 10 or fewer automation servers Upgrades Enterprise Server, with 10 or fewer hosted automation servers, from EcoStruxure Building Operation software version 3.x to 4.0 or later.	SXWSWESUP30010
Enterprise Server Upgrade – 50 or fewer automation servers Upgrades Enterprise Server, with 50 or fewer hosted automation servers, from EcoStruxure Building Operation software version 3.x to 4.0 or later.	SXWSWESUP30050

Enterprise Server

Enterprise Server Upgrade – 100 or fewer automation servers
 Upgrades Enterprise Server, with 100 or fewer hosted automation servers, from EcoStruxure Building Operation software version 3.x to 4.0 or later. SXWSWESUP30100

Enterprise Server Upgrade – 250 or fewer automation servers
 Upgrades Enterprise Server, with 250 or fewer hosted automation servers, from EcoStruxure Building Operation software version 3.x to 4.0 or later. SXWSWESUP30250

Add-on options

ES Hosting AS Pack - 01, License to add 1 automation server in addition to the original Enterprise Server purchased size. SXWSWASES00001

ES Hosting AS Pack - 10, License to add 10 automation servers in addition to the original Enterprise Server purchased size. SXWSWASES00010

ES Hosting AS Pack - 50, License to add 50 automation servers in addition to the original Enterprise Server purchased size. SXWSWASES00050

ES Hosted Node Pack - 5, License to add 5 Non-SpaceLogic servers/controllers. SXWSWNDES00005

ES Hosted Node Pack - 10, License to add 10 Non-SpaceLogic servers/controllers. SXWSWNDES00010

ES Hosted Node Pack - 25, License to add 25 Non-SpaceLogic servers/controllers. SXWSWNDES00025

ES Hosted Node Pack - 50, License to add 50 Non-SpaceLogic servers/controllers. SXWSWNDES00050

ES Hosted Node Pack - 100, License to add 100 Non-SpaceLogic servers/controllers. SXWSWNDES00100

ES Hosted Node Pack - 300, License to add 300 Non-SpaceLogic servers/controllers. SXWSWNDES00300

ES Hosted Node Pack - 600, License to add 600 Non-SpaceLogic servers/controllers. SXWSWNDES00600

SW-EWS-1, EcoStruxure Web Services (run-time) option
 Consume only for one Enterprise Server or one Enterprise Central SXWSWEWSX00001

SW-EWS-2, EcoStruxure Web Services (run-time) option
 Serve & Consume for one Enterprise Server or one Enterprise Central SXWSWEWSX00002

SW-EWS-3, EcoStruxure Web Services (run-time) option
 Serve & Consume, plus Historical trend log data for one Enterprise Server or one Enterprise Central SXWSWEWSX00003

SW-GWS-1, Web Services (Generic Consume) option
 For one Enterprise Server or one Enterprise Central SXWSWGWSX00001

SW-SNMP-1, Alarm notifications via SNMP option
 For one Enterprise Server or one Enterprise Central SXWSWSNMP00001*
 * Enterprise Server allows hosted automation servers to inherit this license, so that the full Enterprise Server system only requires one license.

EcoStruxure Building Operation SmartDriver option
 For one AS-P server or Enterprise Server SXWSWSDRVX0001

SW-SMART-CONNECT, Smart Connector deployment license
 For one Smart Connector deployment SXWSWSCDL100001

Building Operation Personal Dashboards option, 1 per server required for users logging on to that server to have Personal Dashboard capabilities
 For one Enterprise Server or one Enterprise Central SXWSWDASH00001

SW-ESDBTS-1, TimescaleDB connection option
 For one Enterprise Server SXWSWESDBTS001*
 * Enterprise Server allows hosted automation servers to inherit this license, so that the full Enterprise Server system only requires one license.

EcoStruxure Building Operation, Microsoft SQL Server connection option
 For one Enterprise Server SXWSWESDBMS001*
 * Enterprise Server allows hosted automation servers to inherit this license, so that the full Enterprise Server system only requires one license.

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EcoStruxure Building Operation, AVEVA PI System connection option
For one Enterprise Server

SXWSWESDBPI001*

* Enterprise Server allows hosted automation servers to inherit this license, so that the full Enterprise Server system only requires one license.

SW-ESCMPLPK-1, Regulated Industries Compliance Pack option
For one Enterprise Server

SXWSWCMLPK001*

* SXWSWCMLPK001 includes SXWSWESDBTS001 and SXWSWESPDFSS01.

SW-ESPDF-1, Building Operation PDF signing option
For one Enterprise Server

SXWSWESPDFSS01

SW-ESMQTT-1, MQTT option
For one Enterprise Server

SXWSWMQTTSRW01*

* Enterprise Server allows hosted automation servers to inherit this license, so that the full Enterprise Server system only requires one license.

Building Operation Zoning option
For one Enterprise Server

SXWSWESSDZR001

SAML Authentication option
For one Enterprise Server

SXWSWESSAML001*

* Enterprise Server allows hosted automation servers to inherit this license, so that the full Enterprise Server system only requires one license.

Semantic DB Plus 2 CPU Cores
Additional concurrent queries for one semantic database

SXWSWSTDBAC002

Semantic DB Plus 6 CPU Cores
Additional concurrent queries for one semantic database

SXWSWSTDBAC006

Semantic DB External Use Plus 2 CPU Cores
Enables queries from external tools and additional concurrent queries

SXWSWSTDBEUAC2

Semantic DB External Use Plus 6 CPU Cores
Enables queries from external tools and additional concurrent queries

SXWSWSTDBEUAC6

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