EcoStruxure
Innovation At Every Level

Edge Server
EcoStruxure Building Operation

EcoStruxure™ Building

Introduction

As part of a scalable EcoStruxure Building Management System (BMS), Edge Server provides key functionality, such as control logic, trend logging, and alarm supervision, and supports communication and connectivity to IP based field buses. The distributed intelligence of the EcoStruxure BMS helps ensure fault tolerance against detected faults and provides a fully featured user interface through WorkStation and WebStation.

Edge Server has the same role in an EcoStruxure BMS as the automation server, such as SpaceLogic AS-P, but is software only using modern deployment and orchestration technologies.

Features

Edge Server is a powerful software component for customers who prefer use of container technologies for hosting software applications. In a small installation with IP based field controllers, Edge Server acts as a standalone server. In medium and large installations, functionality is distributed over multiple Edge Server instances that communicate over TCP/IP with Enterprise Server as the Operational Technology (OT) orchestrator.

Edge Server has the following features:

- Communications hub
- Container
- Authentication and permissions through powerful systems

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Edge Server

- WorkStation/WebStation interface
- Native BTL-listed BACnet support
- BACnet/SC node, hub, or router
- Native Modbus support
- Web Services support based open standards
- EcoStruxure Web Services support
- MQTT IoT protocol support
- External log storage option
- Reporting
- Text and graphics-based programming tools
- I/O expansion option
- IT friendly networking based on the TCP/IP suite of communication protocols
- TLS support

Communications hub

Capable of coordinating traffic from above and below its location, Edge Server can deliver data directly to you or to other servers throughout the site. Edge Server can run multiple control programs, manage alarms and users, handle scheduling and logging, and communicate using a variety of protocols. Because of this, most parts of the system function autonomously and continue to run as a whole even if communication is interrupted or individual EcoStruxure BMS servers or devices go offline.

Container support

Edge Server can be seen as a software-only version of SpaceLogic AS-P, enabling very fast and more secure deployment, a high level of resiliency, and ultra-fast disaster recovery. Edge Server can be deployed on operating systems with Linux container support and in large installations, and orchestration infrastructure such as Kubernetes can be used.

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 or, if used with Enterprise Server, against Windows Active Directory or a SAML 2.0 identity provider. The built-in account management system allows an administrator to establish password policies that meet stringent cybersecurity guidelines. When Windows Active Directory is used, the administration costs are lower because users do not have to be managed in multiple directories.

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 Edge Server to engineer, commission, supervise, and monitor the server as well as the IP based field bus controllers that the server hosts. See the WorkStation and WebStation specification sheets for additional information.

Open building protocol support

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

Native BTL-listed BACnet support

Edge Server communicates directly to BACnet/IP networks. Edge Server is BTL-listed as BACnet Building Controllers (B-BC), the most advanced BACnet Device Profile. This capability provides access to an extensive range of BACnet devices from Schneider Electric and other vendors. See the BTL Product Catalog for up-to-date details on BTL listed firmware revisions on BACnet International's home page. Edge 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

Edge Server supports BACnet/SC applications as a BACnet/SC node, hub, and router. This allows Edge Server to be in BACnet/SC networks and support applications that connect BACnet/IP 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.

Native Modbus support

Edge Server natively integrates Modbus TCP client and server configurations. 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

Edge 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 system directory browsing, read/write of current values, alarm receipt and acknowledgement, and historical trend log data. EcoStruxure

Edge Server

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.

External log storage option

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.

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.

I/O expansion

For applications that require remote I/O resources, the SpaceLogic IP-IO modules provide a versatile mix of I/O points for any application. For more information, see the SpaceLogic IP-IO Specification Sheet.

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.

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
- DNS for simple lookup of addresses
- HTTP/HTTPS for Internet access through firewalls, which enables remote monitoring and control
- SMTP or SMTPS with support for SSL/TLS based authentication, enables sending email messages triggered by schedule or alarm
- SNMP enables network supervision and 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.

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Specifications

Edge Server	
Communications	
BACnet	BACnet/IP, port configurable, default 47808 BACnet/SC, port configurable, no default port
BACnet profile	BACnet Building Controller (B-BC)
BACnet certification a) See the BTL Product Catalog for up-to-date details on BTL listed firmware revisions on BACnet International's homepage.	BTL Certification (BTL Listing[a], WSPCert)
Modbus	Modbus TCP, client and server
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
SMTPS	Email sending, port configurable, default 587
SNMP	version 3 Network supervision using poll and trap Application alarm distribution using trap
Part numbers	

In the following description, a Connected Product is a communicating device directly connected to a BACnet/IP or Modbus TCP network driven by Edge Server. A device connected to an RP or MP controller is not a Connected Product.

Edge Server – Standalone SW Support for 10 Connected Products and Modbus TCP.	SXWSWEBU0000SA
Edge Server – Standard SW Support for 25 Connected Products, Modbus TCP, and Enterprise Server communication.	SXWSWEBU0000SD
Edge Server – Enhanced SW Support for 100 Connected Products, Modbus TCP, and Enterprise Server communication.	SXWSWEBU0000EN
Edge Server – Full SW Support for 300 Connected Products, Modbus TCP, and Enterprise Server communication.	SXWSWEBU0000FU
Edge Server License Upgrade – Standalone to Standard Upgrades from 10 to 25 Connected Products and adds Enterprise Server communication.	SXWSWEUP00SASD
Edge Server License Upgrade – Standalone to Enhanced Upgrades from 10 to 100 Connected Products and adds Enterprise Server communication.	SXWSWEUP00SAEN
Edge Server License Upgrade – Standalone to Full Upgrades from 10 to 300 Connected Products and adds Enterprise Server communication.	SXWSWEUP00SAFU
Edge Server License Upgrade – Standard to Enhanced Upgrades from 25 to 100 Connected Products.	SXWSWEUP00SDEN
Edge Server License Upgrade – Standard to Full Upgrades from 25 to 300 Connected Products.	SXWSWEUP00SDFU

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Edge Server License Upgrade – Enhanced to Full Upgrades from 100 to 300 Connected Products.	SXWSWEUP00ENFU

Add-on options	
SW-EWS-1, EcoStruxure Web Services (run-time) option Consume only for one automation server	SXWSWEWSXX0001
SW-EWS-2, EcoStruxure Web Services (run-time) option Serve & Consume for one automation server	SXWSWEWSXX0002
SW-EWS-3, EcoStruxure Web Services (run-time) option Serve & Consume, plus Historical trend log data for one automation server	SXWSWEWSXX0003
SW-GWS-1, Web Services (Generic Consume) option For one automation server	SXWSWGWSXX0001
SW-SNMP-1, Alarm notifications via SNMP option For one automation server	SXWSWSNMPX0001
EcoStruxure Building Operation SmartDriver option For one AS-P server, Edge Server, or Enterprise Server	SXWSWSDRVX0001
Building Operation Personal Dashboards option, 1 per server required for users logging on to that server to have Personal Dashboard capabilities For one automation server	SXWSWDASHX0001
SW-ASDBTS-1, TimescaleDB connection option For one automation server (not required if the parent Enterprise Server has a license)	SXWSWASDBXS001
EcoStruxure Building Operation, Microsoft SQL Server connection option For one automation server (not required if the parent Enterprise Server has a license)	SXWSWASDBMS001
SW-ASMQTT-1, MQTT option For one automation server (not required if the parent Enterprise Server has a license)	SXWSWMQTTXRW01

Hardware requirements	
Processor frequency	1 GHz
Processor architecture	AMD64 or x86-64
Processor cores	2
Memory	1 GB
Storage capacity	4 GB

Software requirements	
Operating systems	OCI compliant container runtime on Linux x86-64
Quality assurance testing has been performed on, and support is provided with, Ubuntu 20.04 and 22.04 with Docker Engine version 20.10.00. Other deployment scenarios have not been tested by Schneider Electric. Product Support Services may require that potential issues can be reproduced in tested and supported environment for full support.	
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	Microsoft SQL Server 2016 SP1 and later
The following Microsoft SQL Server editions are supported: Enterprise, Standard, and Express.	

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