PERFORMANCE

EcoStruxure Building Operation 2023

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The world of your building

~40% of the world's CO_2 emission comes from buildings[1]

>350 natural + man-made disasters in the world in 2019[2]

>30% of the energy is wasted in buildings[3]

~90% of our time is spent indoors[4]

Source:
[1] Architecture 2030, 2020
[2] Facts + Statistics: Global catastrophes, Insurance Information Institute, 2020
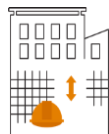[3] U.S. Environmental Protection Agency, 2020
[4] Joseph G. Allen, Healthy Buildings Program, Harvard University, 2019

The Foundation of Buildings of the Future

Hyper-efficient
Maximize performance by optimizing system and workflow

Resilient
Recover quickly and bounce back

Sustainable
Consume less, extend life of assets, and spend wisely

People-centric
Ensure a comfortable and productive setting for all people

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Building Operation enables the Buildings of the Future

Hyper-efficient

Maximize performance by optimizing system and workflow

- Automate Operations
- Monitor and Analyze Performance in Real-Time
- Integrate Data Across Platforms and Systems

Resilient

Recover quickly and bounce back

- Operate Remotely
- Visualize Entire Building OT
- Reduce Risk with Cybersecure Platform

Sustainable

Consume less, extend life of assets, and spend wisely

- Maximize Electrification
- Drive Energy Efficiency Building Certifications
- Integrate EV Charging & Renewable Energy Sources

People-centric

Ensure a comfortable and productive setting for all people

- Ensure Comfort
- Improve Service Level Response
- Make Buildings More Healthy

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Hyper-efficient

Automate operations

- Advanced alarms and SMS notifications
- Integration with analytics and third-party data
- IP-based and easy to manage

Achieve better insights

- Flexible, easy to create and use dashboard
- Advanced trend logs, alarms, and alerts
- Access to historical data and graphics

Open integration

- Truly open, vendor-neutral, bi-directional system
- Scalable, flexible integrations via API
- Open platform structure means your data isn't locked into a proprietary format
- Multiple database options for external log storage

People-centric

Drive comfort and productivity

- Tighter control of assets for comfort
- Needs-based HVAC and advanced scheduling
- Scalable to fit evolving occupant needs

Improve service levels and response time

- Advanced, proactive alarms
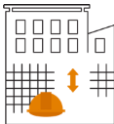- Rich graphics
- Integrates with analytics platforms

Optimize building health

- Indoor environmental quality management
- Accurate people-counting sensor for fine-tuned, precise HVAC control
- Integration with SE and 3rd party sensors and Occupant Well-Being software

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Resilient

Faster deployment

- Scale up projects faster than ever with software-only Edge Server
- Increased resilience and security

Remote operations

- Secure and web-based remote login
- Mobile-friendly access from any device
- Leverage cloud-based infrastructure
- Centralize remote monitoring across portfolio with scalable architecture

Power reliability

- Easy to use dashboards with reporting and trend analysis for simple use cases
- Integration with Power Monitoring Expert for complex use cases

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Sustainable

Maximize electrification

- Monitor your electrical system
- EBO data can be fed into anything from dashboards to complex power monitoring
- Insights & real-time usage on EV charging points

Actively manage energy

- Proactive energy reduction with demand response system integration

Move towards decarbonization

- Optimize how and when you use energy
- Achieve energy certifications like LEED
- Software only (no hardware) new Edge Server
- Reduce embodied carbon with Green Premium connected devices

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EcoStruxure Building Operation achieves outcomes that deliver more value to owners and facility managers and drive better experiences for occupants

Access More Information
Enable better, more informed decision making to reduce energy use

Performance & Efficiency
Faster engineering, better software performance, and easier upgrades

Cybersecurity & Compliance
Protect your infrastructure and stay current with standards

Occupant Comfort & Satisfaction
Create productive, comfortable, healthy spaces for tenants

How do you solve this today, what is your strategy?

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EcoStruxure Building Operation improves building performance with connected, real-time tools that are purpose-built for your needs

EBO is a modern building management system with unmatched power to:

- **Provide better data visibility** with customizable dashboards and rich graphics

- **View more data in one place** with Building Operation's open integration approach

- **Increase energy and operational efficiency** by monitoring, maintaining & controlling building ops in one network

- **Achieve visibility at scale** with views at the device, floor, building, campus & portfolio level

- **Enable on the go and remote viewing** with mobile friendly design

- **Better serve occupants** with custom kiosk displays and occupant app integrations

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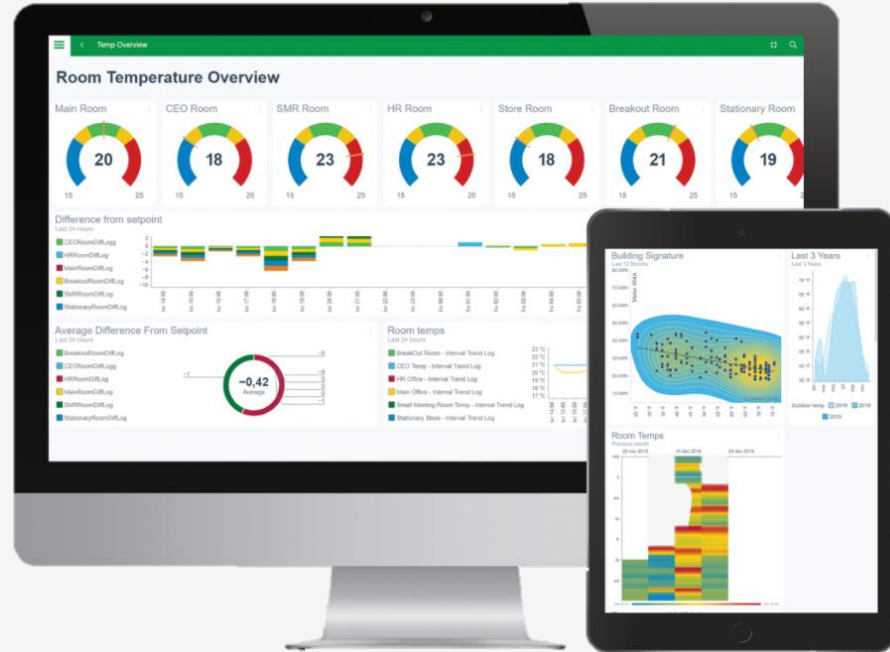
EcoStruxure Building Operation

Optimize buildings, reduce energy use, and move towards net-zero carbon

Dashboards
Role-specific personalized dashboards providing data visualization and increased understanding

Reporting and Trends
Create powerful custom reports sharing building trends and performance directly from EBO

Webstation UI
Gain secure full building system access from a PC browser on the go from tablets and mobile devices

Alarm Management
Best in class alarm management to keep you on top of building issues

Tools
System tools designed for the Integrator maximizing engineering efficiency

Cybersecure
Reduce cyber threat risk as technology evolves

Open
Diverse integration possibilities driving complete single control center experiences

Upgradeable
System flexibility to upgrade and expand on your terms

Scalable
Fully modular and scalable architecture to meet buildings of any size and complexity

Semantic Tagging
Access to information and insights in human-readable form

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EcoStruxure Building Operation: Flexibility with Scalability

Fully modular and scalable architecture to meet buildings of any size and complexity

- **Edge Level Servers for Buildings of Any Size**
  Enterprise Central, Enterprise Server, and Automation Servers for scalable, configurable system deployments

- **Web Based Clients**
  View any system level with customizable persona-based views on PC, tablet, or phone through the web-based browser, Webstation

- **Powerful Engineering Clients**
  Engineer, configure and view any level of the system on a PC with the Workstation client

- **IP Based Architecture**
  Robust, secure, and flexible IP connectivity down to the room level

- **Multi-version Support**
  Run servers at different version numbers for improved expansion and upgrade possibilities on your schedule
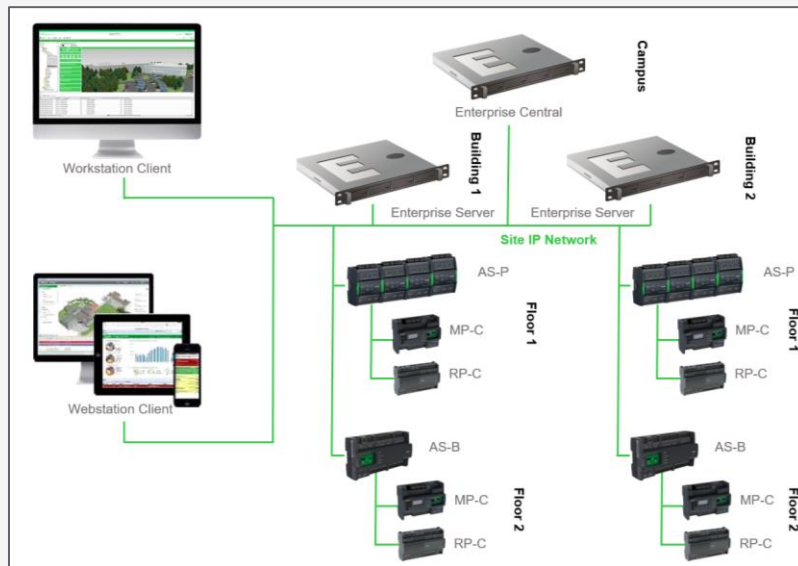
Did you know: 1 EC supports up to 50 ES servers, for a total of 2500 AS in one system

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EcoStruxure Building Operation: Edge Server

Deliver projects faster with the new software-only automation server

- **Minimize Hardware & Cost with a Streamlined Approach**
  Software-only version of AS-P deployed as a docker container, perfect for settings where hardware functions aren't needed, and minimal costs/equipment is desired

- **Reduce Embodied Carbon in a Building**
  No hardware or power supplies means significantly less embodied carbon (Scope 3) vs a standard install

- **Faster Project Delivery**
  Install in seconds instead of months; No need for electricians or waiting for hardware delivery

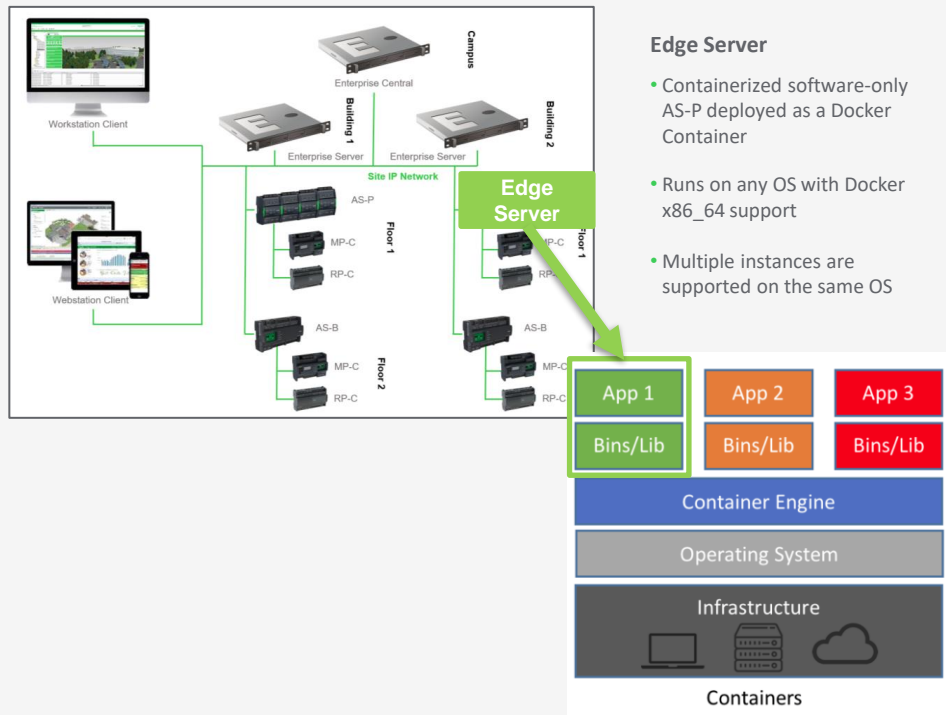- **Increased Resilience**
  Faster disaster recovery, fewer physical components

- **Increased Availability**
  Faster upgrades – less downtime, fewer components

- **Increase Resilience and Cybersecurity**
  Better isolation, fewer ports, easier to orchestrate & monitor

Edge Server

- Containerized software-only AS-P deployed as a Docker Container

- Runs on any OS with Docker x86_64 support

- Multiple instances are supported on the same OS

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EcoStruxure Building Operation: Open Integration

Diverse integration possibilities driving complete single pane of glass experiences

- **Standard Protocols**
  Native support for common standard protocols including BACnet, LonWorks, Modbus, and Web Services

- **Modbus Device Integration**
  Speed up onboarding and integration with library of Modbus devices, including power meter data

- **MQTT**
  Native compatibility for publishing & subscribing to IoT sensors via MQTT protocols & brokers

- **Open Databases**
  Open-source format databases with optional time-series database tools allow for database access from EBO as well as 3rd party tools

- **Smart Connector APIs**
  Enable new capabilities, apps, and solutions with open-source developer framework for 3rd party integration

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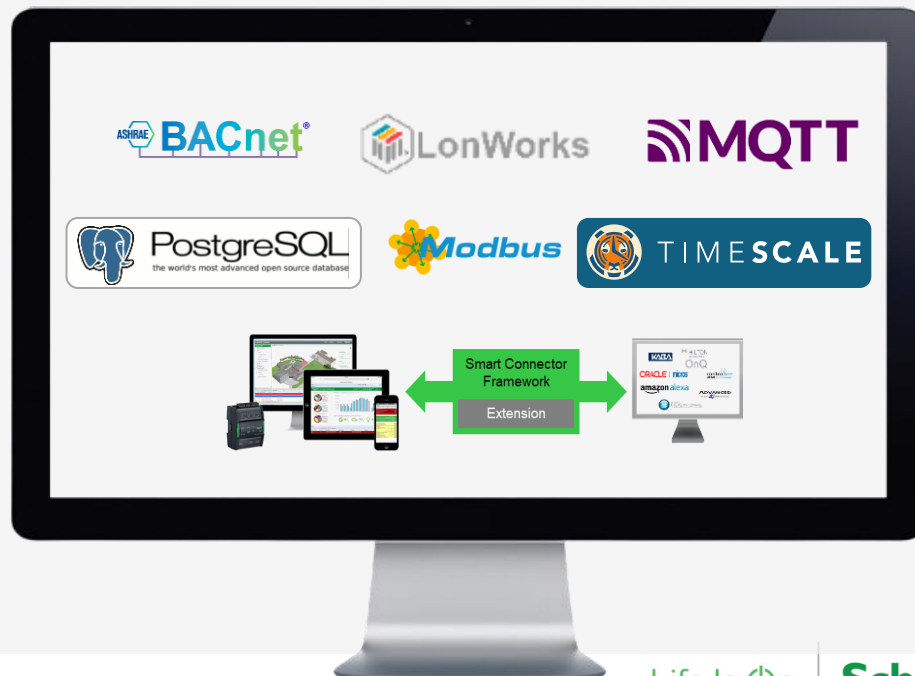
EcoStruxure Building Operation: Tools

System tools designed for the Integrator maximizing engineering efficiency

- **Workstation**
  Dedicated integrator platform for EBO system design and configuration customization while maintaining engineering workflows and efficiency

- **Modernized Programming**
  Visual object-oriented system streamlines programming, and lowers personnel requirements and project costs while keeping customizability

- **Automated Engineering Tool (AET)**
  Streamline creation & deployment of reoccurring system elements via standards creation, duplication, configuration

- **Project Configuration Tool (PCT)**
  Integrators can engineer and test entire solutions remotely prior to installation of HW on site

- **Building Commission Tool**
  Commission SpaceLogic MP/RP controllers with your favorite Android, Apple iOS, or Windows 10/11 devices
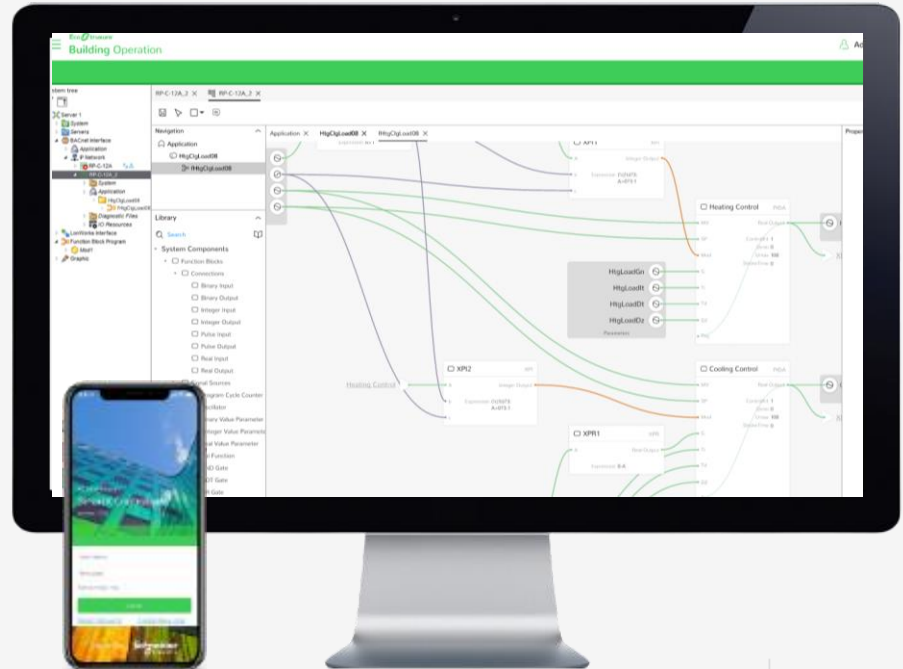
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EcoStruxure Building Operation: WebStation

Gain secure, full-building system access from PC browsers, tablets, and mobile devices

Mobile Friendly
Secure web-based access from any device providing complete system access for FMs and technicians working throughout the building

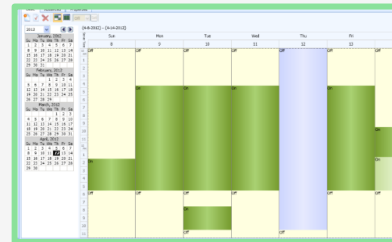**Customizable Graphics**
Scalable 2D and 3D vector graphics with live updating data overlays providing easy contextual views of equipment or spaces

Alarm Management
Graphical alarms, integrated email & SNMP notifications, and management tools for acknowledgement, tracking, notes, and checklists

Scheduling
Campus wide automation through calendar schedules and special event configurations pulled from Outlook or other external sources

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EcoStruxure Building Operation: Dashboards

Role specific personalized dashboards providing data visualization and deeper insights

- **Data Visualization**
  Don't just collect data, understand it. Access and visualize building data to provide context, make it easy to digest, and understand what it is telling you.

- **Customizable**
  Quickly and easily create dashboards with out of the box widgets or create custom dashboards with customer-specific graphics or chart types

- **Role Specific**
  Show the right level of data to those that need to see it by creating user or role-specific views of dashboards with their preferences in mind

- **Mobile Friendly**
  Browser-based logins and automatic scaling mean dashboards can be properly viewed from small screen smartphones to large screen network operation monitors

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EcoStruxure Building Operation: Trends & Reporting

Create powerful custom reports sharing building trends and performance directly from EBO

- **Trends – Historical Data**
  Give context to live data by showing its relation to the past. Can be overlayed with other data on separate axis to show relations and processed within EBO before plotting (i.e., net variable energy usage)

- **Trends – Export Logs**
  EBO databases are open and will allow for native exporting of the data itself as well as trend logs and other information into .csv and .xml

- **Reports – Flexible Reporting Tool**
  Create out-of-the-box reports for common data such as energy consumption or alarms or create fully custom reports, complete with customer logos, based on imported templates

- **Reports – Configuration**
  Highly customizable reports using pre-configured or ad hoc criteria including date range, cost, consumption, and CO_2 emissions to ensure your data supports the message your reports are working to convey

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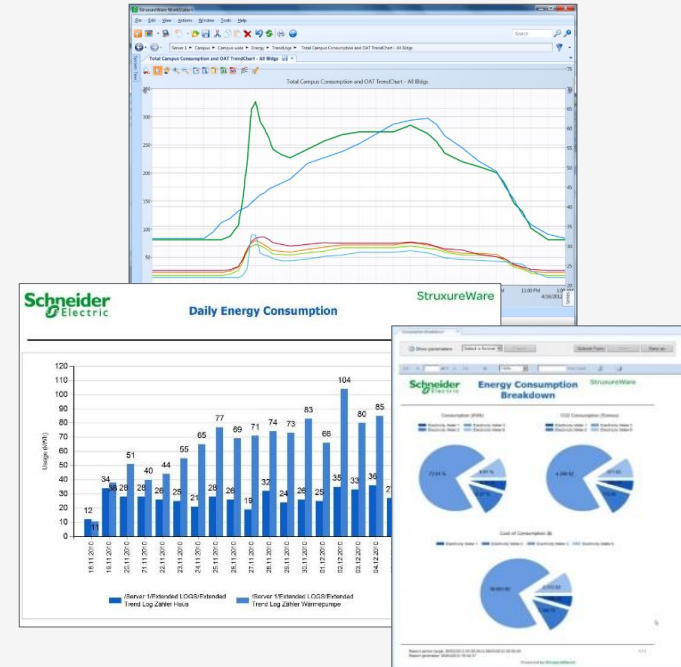
EcoStruxure Building Operation: Alarms

Best in class alarm management to keep you on top of building issues

- **Alarm and Event Management**
  Integrated email & SNMP notifications with management tools for acknowledgement, tracking, notes, and checklists that make FM teams more productive and responsive

- **Alarm Recognition**
  Flexible and configurable suite of "alarm decoration rules" allows users to change alarm presentation based on conditions or criticality. Parameter-based sorting and custom notifications enhance visibility on smaller issues.

- **Graphical Alarms**
  Attach graphics to alarms for easy reading by the user for system status during and leading up to the alarm at hand

- **Alarm Protection**
  Additional options to require single or double acknowledgment of alarms ensure specific critical scenarios are responded to according to company policy

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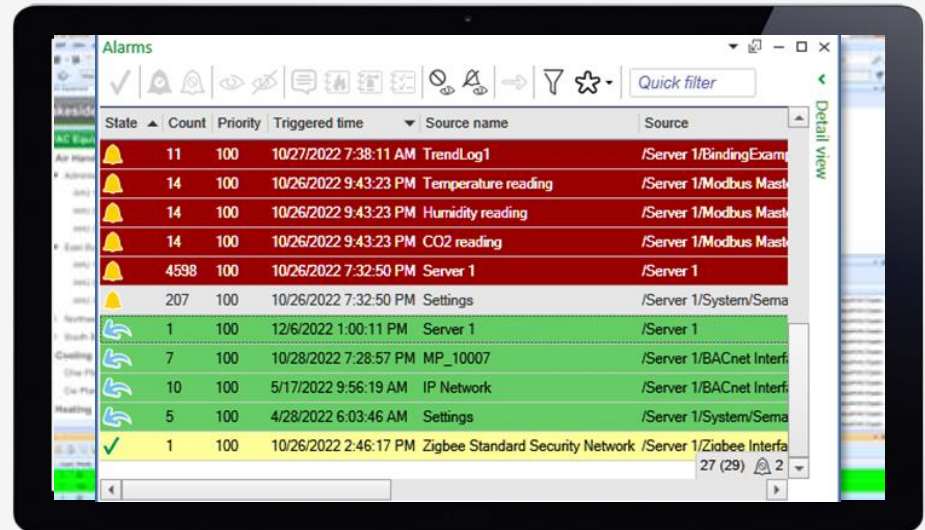
EcoStruxure Building Operation: Enhanced Cybersecurity

Reduce cyber threat risk as technology evolves

- **Secure Development Lifecycle (SDLV2) Policy**
  Following IEC62443-4-1 and Schneider Electric polices, SDLV2 brings security awareness throughout the entire start to finish development lifecycle

- **IPv6 Support**
  EBO servers support IPv6 for server-to-server & client-to-server communication, allowing IT personnel to meet application specifications & reduce costs

- **Advanced Encryption and Authentication and Secure by Default Features**
  Secure communications via standard protocols alongside conservative default settings means instant protection and a high baseline for security

- **BACnet /SC (Secure Connect)**
  ES, AS-P, and AS-B fully support BACnet /SC node, hub, and router functions, securing BACnet traffic over IP networks and devices on BACnet /SC networks

- **Secure Boot Automation Servers**
  Available secure boot AS-Ps mean only digitally signed trusted software will run protecting facilities against software alteration

Technology highlights:

- SSO SAML 2.0 Compatible
- TLS 1.3 support
- CA Certificates
- Secure email
- Password policies
- Change password on first use
- Auto logoff timers
- Role-based access control (RBAC)
- Object level security
- Active Directory integration
- Audit logs
- System information and event monitoring (SIEM) integration
- Full system backup, recovery and reconstitution

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