

A low-angle, upward-looking photograph of several modern skyscrapers with glass facades. The image is overlaid with a semi-transparent red filter. The buildings are arranged in a way that creates a sense of height and architectural scale. The sky is a clear, pale blue.

Automated  
Logic

# CHOOSING THE CORRECT BAS SYSTEM



# INTRODUCTION

In today's rapidly evolving building landscape, the choice of a Building Automation System (BAS) is more critical than ever. Did you know that according to a U.S. Department of Energy report, the implementation of well-designed building controls can lead to significant energy savings, potentially reducing commercial building energy consumption by approximately 29%? <sup>1</sup> Choosing the right platform is not just about efficiency and reliability; it's a strategic investment crucial for ensuring long-term operational performance, occupant comfort, and significant cost savings. The following are some key items to consider when selecting a BAS system to avoid common pitfalls and maximize your building's potential.



## Beyond 'Open': Ensuring BAS Professionalism and Accountability

While some manufacturers claim their BAS products are "open," genuine openness goes beyond just supporting an open protocol. In addition, open does not preclude some BAS manufacturers for charging licensing fees to the end user. It means end users can procure products from various seasoned suppliers with proven installation and service expertise. Dependence on inexperienced or fragmented suppliers can result in costly disputes and delays, disrupting operational continuity.

**Ask the following questions when evaluating a BAS System and contractor:**

1. Is the BAS contractor a BAS professional with years of BAS installation and service experience?
2. Does the BAS system allow the installing contractor to restrict or control access after installation?
3. When selecting a BAS system and using multiple "suppliers," which "supplier" gets the blame when there is an issue with the BAS system?

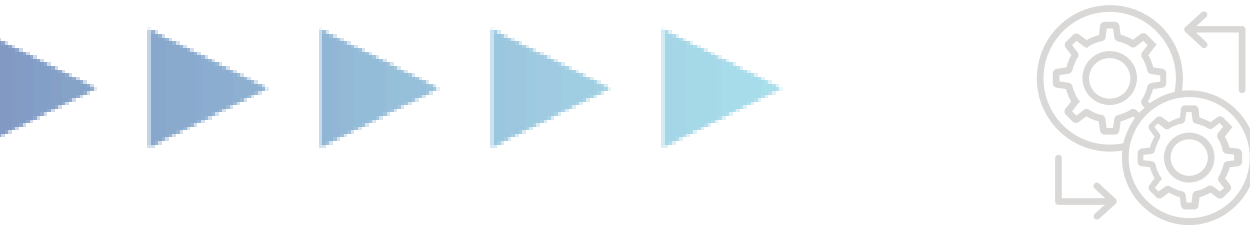
<sup>1</sup> Report Delves Into the Impacts of Commercial Building Controls on Energy Savings. (2017). Energy.gov. <https://www.energy.gov/eere/buildings/articles/report-delves-impacts-commercial-building-controls-energy-savings>

## Implementation of BACnet Protocol

BACnet is an open protocol supported by ASHRAE through ASHRAE Standard 135. The purpose of the BACnet protocol is to promote interoperability between devices and systems. A BAS system that fully implements the BACnet protocol throughout its architecture ensures an owner's ability to integrate with other systems.

**Ask the BAS vendor the following question:**

1. How will the BAS contractor provide proof that the BACnet protocol is implemented throughout the system from the field level controllers all the way up to the server level?

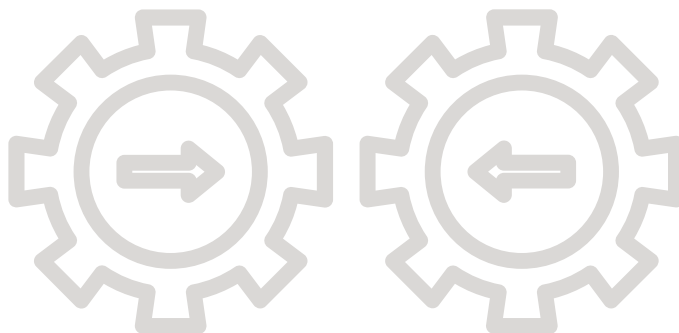


## Backward Compatibility

Backward compatibility allows users to integrate older devices and systems without requiring extensive modifications or upgrades. This feature is essential for maintaining operational continuity and reducing upgrade costs.

**Consider the following to determine BAS vendor backward compatibility:**

1. Which older/legacy controllers does the BAS vendor's current platform/user interface work with? Is any additional hardware or software required for this interface?
2. How many platforms/user interface versions have there been over the last 15 years?



## Unlimited Point/Devices Capability



Unlimited point and device capability enables users to scale their systems without constraints. Some BAS vendors may impose limitations on the number of points and/or devices, potentially hindering scalability. Limited scalability can force costly system replacements or hinder future expansion, impacting your building's agility and value.

**Ask the following questions to determine the BAS system point/device capability:**

1. How many points can the BAS system support?
2. How many controllers/devices can the BAS system support?
3. What is the cost for adding additional points and/or controllers to the BAS system?

## Self-serve Ability

Empowering your team with robust self-serve capabilities can significantly reduce reliance on external support, leading to faster issue resolution and substantial cost savings over time. This functionality allows users to configure, monitor, and manage their systems independently of the BAS vendor and/or contractor, ultimately enhancing operational efficiency.

**Evaluate the following items to determine self-serve capability:**

1. Are all the programming/software/technician tools required to work on the BAS system included with the installation?
  - a. Are there any recurring costs for these tools?
  - b. Are these tools seat-based? If so, what is the cost per seat?
2. What training on the tools is available to the end user?
3. What is the cost of the training?
4. Does the BAS system include a library of equipment graphics and equipment/system programs?

## Licensing Framework

A simple licensing framework typically leads to reduced life cycle costs and fewer headaches for the end user. Transparency is a key benefit of a simple framework.

**Ask the BAS vendor the following:**

1. How many concurrent users are included with the installation?  
What is the cost for additional users?
2. Is any type of software maintenance plan/agreement required to keep the BAS system software updated?
3. Are there any additional annual fees required to keep the system and/or technician tools operational?
4. Does the end user own the license to the BAS system?



## Standard and Uniform Intuitive User Interface

A BAS system with a standard and uniform intuitive user interface ensures ease of use and reduces the learning curve for inexperienced users. A truly intuitive and uniform user interface is essential for maximizing operator efficiency, reducing training time, and fostering greater system engagement.



**When evaluating BAS vendors ask the following questions:**

1. Who owns the user interface design?
  - The BMS manufacturer/vendor?
  - The BMS contractor?
  - Another third party?

## Built-In Diagnostic Capabilities

The BAS system should provide built-in diagnostic capabilities to enable users to quickly troubleshoot issues and easily visualize system performance and trends over time. Rapidly identifying and resolving issues through built-in diagnostics minimizes downtime, prevents equipment damage, and ensures optimal energy performance.

**Does the BAS system user interface have the following capabilities:**

1. Time-Lapse Graphics to view a graphic or graphics over a historical period
2. Ability to view live control logic in the controller
3. Built-in alarm triage capability.

## Reporting Capabilities

Comprehensive reporting capabilities allow users to generate detailed reports on system performance, energy usage, and more.

**Consider the following reporting capabilities of a BAS system:**

1. What is the reporting capability of the BAS system?
2. What standard reports are included with the BAS system?
3. How many custom reports can be created?
4. Can the reports be set up to run and emailed automatically at a pre-determined frequency?



## Pre-Programmed ASHRAE/NIST Standard FDD Rules

ASHRAE and NIST have developed standard fault detection and diagnostics (FDD) rules that can be implemented to improve operational efficiency by providing operators with possible solutions to an FDD type alarm. These features translate directly into enhanced energy efficiency, proactive maintenance, and reduced operational costs.



**Ask the following questions about FDD capabilities:**

1. Does the BAS vendor include a library of FDD rules based on ASHRAE and NIST standards for enhanced monitoring and alarming?
2. Do the FDD rules reside in the cloud or in the controller?

## Bench Tested ASHRAE Guideline 36 Programs

ASHRAE Guideline 36 provides high-performance sequences of operations for airside and waterside equipment/systems to enhance both energy and operational building system efficiency.



**Consider the following ASHRAE Guideline 36 questions when evaluating a BAS vendor:**

1. Does the BAS vendor have a library of both airside and waterside programs capable of meeting the latest edition of ASHRAE Guideline 36?
2. Will the BAS vendor provide a letter of attestation that the ASHRAE Guideline 36 programs have been bench tested to comply with the latest edition of the guideline?

## Is BAS Vendor Dependent on Third Parties to Patch/Repair Software Vulnerabilities?

A BAS vendor/manufacture that owns the source code enhances the security posture of the system because the system is not dependent on third parties for bug fixes and patches. A self-contained, proprietary system, where the vendor controls the source code, often allows for faster, more reliable updates and patches. This direct control minimizes reliance on external parties, significantly reducing vulnerability windows and enhancing your system's overall security and risk mitigation.

**Ask the BAS vendor/manufacture for the following:**

1. Do you own the source code? If not, what entity does?
2. How do you monitor and notify cybersecurity threats and vulnerabilities?





# CONCLUSION

Choosing the right Building Automation System is a significant strategic decision that impacts your building's operational efficiency, energy consumption, and long-term value. By carefully considering these key factors, from the professionalism of your BAS contractor to the security and scalability of the system, you can make an informed choice that maximizes your building's potential and ensures a robust, reliable, and future-ready infrastructure.

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