Reliable controls ®

Better by design™

THE ART of
BUILDING
SUSTAINABILITY

A green building requires a high level of integration between HVAC, lighting, and security systems. The art of building sustainability skillfully combines this integration with nine other technological and supporting elements that must endure over the long term.

reliablecontrols.com

The ART of Building Sustainability

Regardless of how new technologies may impact the evolution of our building automation industry, the goals of industry stakeholders remain largely the same—to achieve sustainability in the built environment.

Those who have completed green building design certification, such as Leadership in Energy and Environmental Design (LEED), National Australian Built Environment Rating System (NABERS), or other green building certifications know an important first step towards certification is to understand the owner's needs and the goals for their building. This understanding can be clarified by participating in design charettes which result in high level discussions between the major design disciplines, who historically may have operated in varying degrees of isolation. The collaboration advocated by LEED, NABERS, or other green building certifications during the design charettes is mirrored when it comes to designing the building automation (BAS) for a green building. The safe, productive, and energy efficient operation of the facility (typically the owner's goal), requires a high level of integration between the major Heating, Ventilation, and Air Conditioning (HVAC), lighting, and security systems (which requires collaboration between historically isolated networks).

A green building requires a high level of integration – the ability to detect who is in the building, where they are permitted to go, and how to optimize the lighting, HVAC and other systems based on occupant preference. Although it is necessary for every green building to achieve a high level of integration between HVAC, lighting, and security systems, it is not a sufficient condition for sustainability. To become a sustainable building, a green building needs more. *It needs to pursue nine elements of The ART of Building Sustainability.*
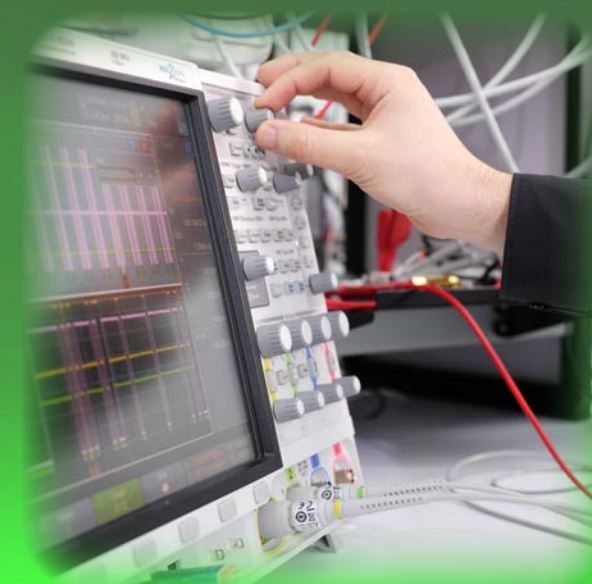
Open protocols allow different vendors to supply components of a control system that can effectively share information and services – to interoperate as a single system. To ensure a strong level of interoperability some open protocol associations use third-party listing laboratories to test and verify adherence to a protocol's form and function. Yet, a number of control vendors still refuse to adopt a common communications protocol, despite the existence of broadly-supported, open, and interoperable building automation control standards, such as BACnet®.

Since 1995 the BACnet protocol has delivered the promise of interoperability for building owners all around the world. Developed under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), BACnet is an American national standard, a European standard, an ISO global standard, and a national standard in more than 30 countries. BACnet International complements the work of the ASHRAE standards committee and BACnet-

Is your IoT vendor making appropriate efforts and investments to have their products certified by a third-party laboratory?

related interest groups around the world. The association facilitates the successful use of the BACnet protocol in building automation and control systems through interoperability testing, educational programs, and promotional activities. Of equal importance, BACnet International also oversees the operation of the BACnet Testing Laboratories (BTL) and maintains a global listing of tested products. A virtual "who's who" of the building automation industry have certified product listings on BACnet International's BTL website with interoperability details for over 900 controls products which span almost every aspect of building control.

2 TECHNOLOGY THAT SUPPORTS SCALABLE AND SECURE DATA COMMUNICATIONS.

3 TECHNOLOGY THAT SUPPORTS REAL-TIME FDD USING EXISTING NETWORK ARCHITECTURES.

Perhaps more poignant than ever before in our industry is the need for improved information security and improved integrity of scalable network infrastructure. Highly integrated HVAC, lighting, and security solutions from a single vendor have the inherent advantage of being able to benefit from a consistent security-hardening strategy across all building systems. Multi-vendor designs, on the other hand, may introduce unintended systemic security weaknesses implemented in work-arounds used to bridge independent or isolated credentialing and encryption methods - silos of inconsistent security and credentialing processes. Improved solutions employ a single sign on (SSO) architecture with good compliance to IT best practices and scalable credentialing architectures such as LDAP and SAML. Although new efforts such as BACnet's Secure Connect (BACnet/SC), are actively being developed to provide a standardized means to create secure communication connections across the internet and within buildings, other vendors have already developed and implemented effective solutions which resolve this connection issue today. These solutions create scalable and secure private networks which tunnel through public networks, using BACnet Virtual Private Networks (B/VPN).
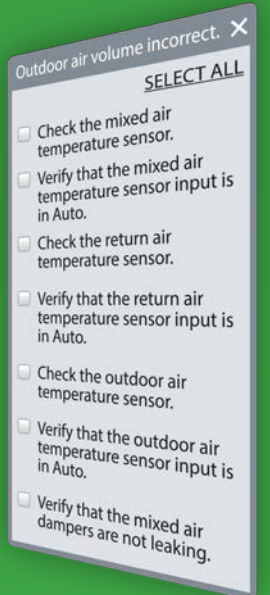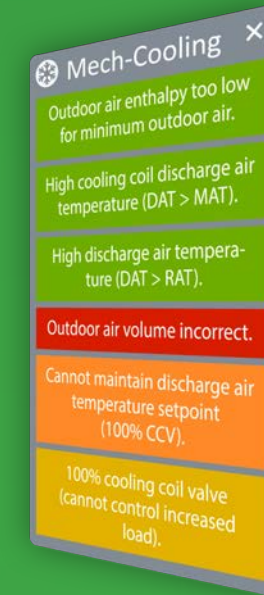
How will you enforce scalable and secure data communications with multiple isolated IoT vendors?

HARDENING GUIDE
BEST PRACTICES FOR INFORMATION TECHNOLOGY SECURITY

SAML
Single Sign On

LDAP

BAS suppliers who deliver a high level of integration between HVAC, lighting, and security systems are ideally positioned to implement effective real-time fault detection and diagnostics (FDD), without third party involvement. The ability for building operators and energy managers to have real-time FDD integrated directly into existing networks is a significant and empowering step towards root-cause analysis and continuous commissioning. Sustainability-minded controls suppliers have already developed and released integrated FDD (IFDD) solutions which help maximize ROI by allowing stakeholders to have real-time fault reporting while using all their existing cabling structures, including twisted-pair networks. Real-time IFDD saves time by avoiding the delayed reporting which may exist with third-party reporting services and extends the expertise of your human capital to help you care for and improve your facility. The depth of system knowledge cultivated by building operators empowered by a real-time IFDD solution will likely be far greater than a third party who only has cursory knowledge of your facility. Using existing cabling structures saves money by avoiding potentially costly cabling upgrades required to meet the specifications of vendors whose architectures will not perform acceptably on twisted-pair networks. Real-time IFDD is available from BAS suppliers today, using existing network architectures and onsite servers, avoiding unnecessary cabling upgrades and third-party analytics service providers.

MECH-COOLING w/Min-OA Diagnostic

Mech-Cooling ✕
- Outdoor air enthalpy too low for minimum outdoor air.
- High cooling coil discharge air temperature (DAT > MAT).
- High discharge air temperature (DAT > RAT).
- Outdoor air volume incorrect.
- Cannot maintain discharge air temperature setpoint (100% CCV).
- 100% cooling coil valve (cannot control increased load).

Outdoor air volume incorrect. ✕   SELECT ALL
- ☐ Check the mixed air temperature sensor.
- ☐ Verify that the mixed air temperature sensor input is in Auto.
- ☐ Check the return air temperature sensor.
- ☐ Verify that the return air temperature sensor input is in Auto.
- ☐ Check the outdoor air temperature sensor.
- ☐ Verify that the outdoor air temperature sensor input is in Auto.
- ☐ Verify that the mixed air dampers are not leaking.

Does your IoT vendor offer real-time FDD for devices on existing network infrastructure?

4. TECHNOLOGY THAT SUPPORTS ANALYTICS FOR ALL STAKEHOLDERS WITHOUT RELINQUISHING DATA OWNERSHIP.

Analyzing mountains of building data and delivering clear insights which speak appropriately to all stakeholder levels requires a tool that is accessible, easy to use, and responsive to a wide range of stakeholder expectations. The activities which result in effective building performance and occupant comfort are best prioritized and driven by building owners, portfolio managers, energy managers, and building operators, who cannot be effective if they are locked out from changing digital media or held back by vendor-restricted licensing or copyrighted sequence of operations. These stakeholders expect their analytics to be formatted appropriately for their unique needs and distributed in a timely manner according to their diverse schedules. They need to turn information into knowledge and actionable insights. BAS suppliers who provide a high level of integration between HVAC, lighting, and security systems are ideally positioned to distribute effective and timely analytics that speak to all stakeholder levels, delivering clear intelligence. This is especially true when the stakeholders themselves can retain full control of selecting the data being gathered, and formatting and scheduling the reports, while retaining full ownership and control of the data and the reports being generated.
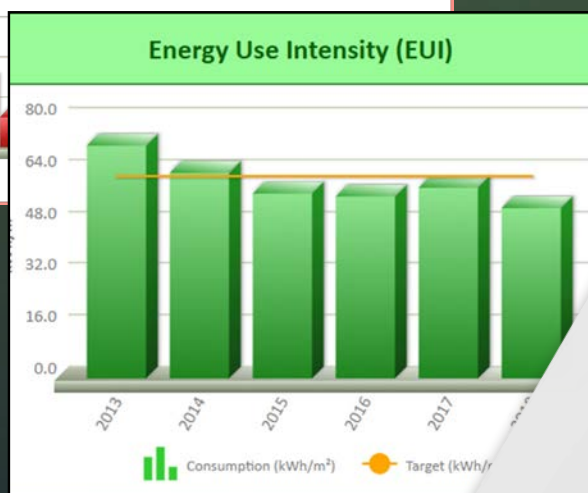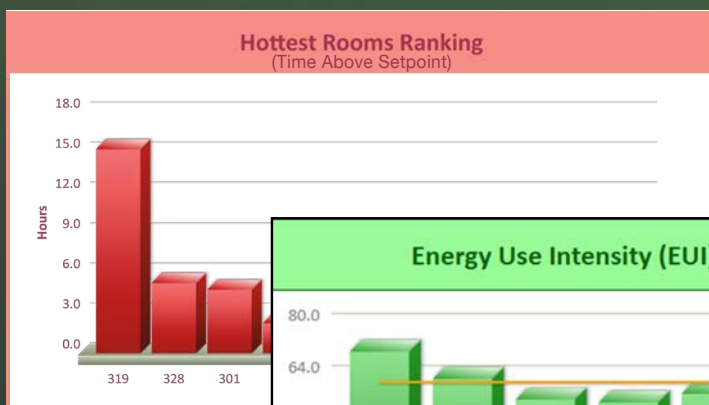
Does your IoT vendor deliver analytics which speak to all stakeholder levels, without relinquishing data ownership?

Hottest Rooms Ranking
(Time Above Setpoint)

Energy Use Intensity (EUI)

BUILDING ENERGY PERFORMANCE REPORT

5. TECHNOLOGY THAT SUPPORTS A MOBILE-CENTRIC BUILDING CULTURE.

Buildings are designed, constructed, and operated to facilitate a safe and productive environment for their occupants. The owners, operators, service technicians, and tenants of a sustainable building expect to be able to interact with the building using their mobile devices. Depending on their role, parameters such as equipment status, real-time occupancy, lighting, ventilation and thermal comfort levels, as well as actual or predicted consumption or costs, should be readily available on a stakeholder's mobile device. Ideally the user experience would be delivered as a holistic, single-app experience. By using their mobile devices, stakeholders can have a significant opportunity to become "better connected" with their building, and in turn, develop the confidence needed to take control of their built environment and foster improved accountability for their choices.

BAS suppliers who facilitate a high level of integration between HVAC, lighting, and security systems, are ideally positioned to create an effective mobile-centric building culture delivered on a single app that is simple, flexible, and sustainable.

Available on the App Store

ANDROID APP ON Google play
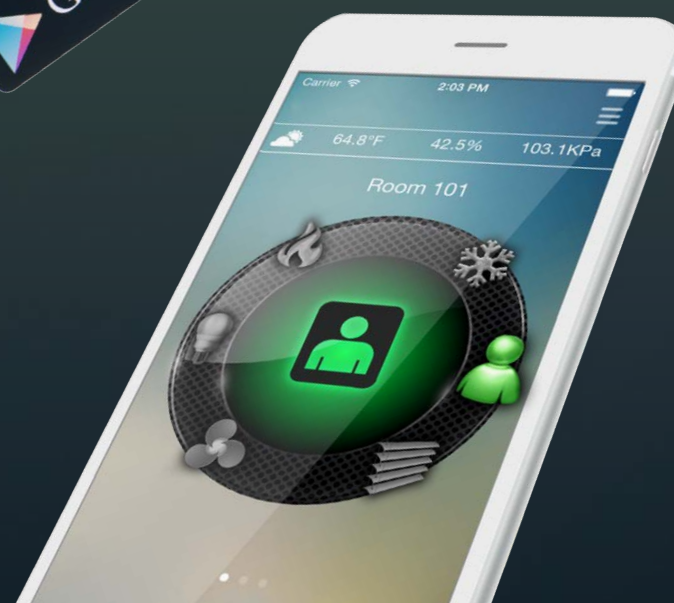
How many different IoT apps will it take to control the HVAC, lighting, and security systems in your building?

The perception of today's emerging IoT technology can all too easily be paired with a cavalier attitude towards product life cycle. Smart thermostats and IoT sensors along with other edge and cloud computing peripherals such as edge-centric gateways, routers, and data storage units can be regarded as trendy commodities which are expected to be readily and repeatedly replaced due to their rapid technical evolution, with perhaps little or no regard to the environmental impacts of their life-cycle or proper disposal. Vendors who are committed to sustainability understand that carefully engineered designs and meticulous component selection will result in high quality electronic sensors and controllers. Such devices will endure for many years, often outlasting the environment they monitor and the equipment controlled. This long-term, better-by-design approach not only provides excellent ROI, but also mitigates the negative impacts of waste management. When electronic components fail or become damaged in the field, life-cycle-centric manufacturers are in an ideal position to offer repair services for those products, even if they have been in the field for decades. Whether the products are under warranty or not, providing effective long-term repair services extends the ROI of the owner's investment and minimizes waste. For situations in which devices are not repairable, manufacturers who are committed to sustainability should participate in environmentally-sound practices such as Waste of Electrical Electronic Equipment (WEEE), Restriction of Hazardous Substances (RoHS), and Responsible Recycling (R2) Directives. This reduces the volume of waste by recycling materials from electronic products prior to disposal, while minimizing the negative impacts to the environment by engineering out toxic components in the product design.

5yr WARRANTY

RoHS COMPLIANT

R2 2013 Responsible Recycling

ISO 9001 14001 QUALITY ENVIRONMENTAL ASSURANCE

Does your IoT vendor offer long-term hardware warranties, repair services, and internationally-recognized cradle-to-grave disposal management?
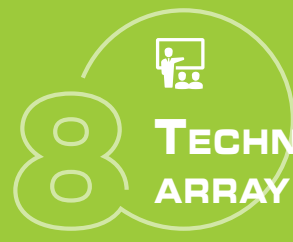
The way a vendor responds to new technologies might shine a light on a fundamental issue in our industry – planned obsolescence. Longevity in the controls industry can give rise to beneficial insights that might not be initially apparent to new stakeholders who are just beginning their careers. When the experience of a BAS supplier spans decades, it is likely the supplier will periodically be compelled to adopt emerging or fundamentally different technologies. The evolution from an older technology to a newer technology has implicit risks for all stakeholders. However, these transitions can present an important learning opportunity for end users and design professionals. It allows these stakeholders to observe how a supplier responds to the issue of backward compatibility with legacy systems and the migration path forward to new technologies. The decisions a BAS supplier makes at these vulnerable and cyclical periods, can be interpreted as a measurement of the "good will" that the supplier has or wishes to create, with its existing customer base. It can also be a key indicator of the fortitude the supplier has in its commitment to adhere to several key tenants of sustainability—resilience, waste reduction, and ROI. BAS suppliers who have a longstanding commitment to the benefits of backward compatibility should be able to minimize the negative impacts of planned obsolescence and provide a migration path forward to new technologies without relying on the tradeoffs associated with third-party gateways or hardware replacement.

Supporting over 35 YEARS of backward COMPATIBILITY

Will your IoT vendor orphan their legacy technology, or will they provide an equitable path forward that supports the benefits of backward compatibility?

GATEWAY

Workstation | 1ST GENERATION | 2ND GENERATION | 3RD GENERATION | 4th GENERATION | NEXT GENERATION

8 TECHNOLOGY SUPPORTED BY A BROAD ARRAY OF TECHNICAL SERVICES.

9 TECHNOLOGY SUPPORTED BY A GLOBAL NETWORK OF LOCAL, FACTORY-CERTIFIED SERVICE PARTNERS.

The computer industry continues to change with regularly occurring advances in performance, resolution, and applications. Within our controls industry, end user expectations are changing too. Many experienced facility managers are retiring, and with their departure, a good amount of expertise is leaving the industry. The next wave of industry operators has had the good fortune of growing up with the latest generations of computer technology, but are quite new to many fundamental concepts in the building automation industry. BAS suppliers who deliver a high level of integration between HVAC, lighting, and security systems are ideally positioned to help both the experienced and new end users alike, to keep up with the changes. BAS suppliers can provide end-users with a wide array of technical services hosted online, ideally accessible through secure web portals.

OPERATOR CERTIFICATION PROGRAM

Web portals could include links to services such as:

- Engineering materials such as hardening guides and open protocol resources.
- Official releases of software, software manuals, and authorization tools.
- Hardware user guides and troubleshooting tools.
- Operating certification programs which would include enrollment services to a variety of online educational videos and examinations, training manuals, and registration for advanced face-to-face classroom courses. The impact of educational videos would increase significantly when closed-captioned in multiple languages to accommodate a global technical audience.

Does your IoT vendor provide a broad array of online technical services?

Face-to-face class instruction.

Building owners and operators know the importance of having knowledgeable, local, service partners. Partners who are passionate about the quality of their services. Partners who understand that only repeat customers are true customers. Partners who are independently accountable for growing the integrity of their brand, and who understand the expectations of their local community. Great service partners invest in their people and ensure adequate training to maintain their technical knowledge and skill level. BAS suppliers who deliver a high level of integration between HVAC, lighting, and security systems, are ideally positioned to provide factory-certification and support to their authorized service partners. This results in long term, consistent, local support for you and your buildings.

DEALER CERTIFICATION PROGRAM
Reliable Controls® Corporation

Does your IoT vendor provide a world-wide network of local, factory-certified service partners?

A green building requires a high level of integration between HVAC, lighting, and security systems. The art of building sustainability skillfully combines this integration with other technological and supporting elements that must endure over the long term. When these elements are maintained over the life of your green building, true building sustainability emerges.

Will your IoT vendor provide effective technological support for the life of your building?

Choose from a global network of factory-certified service partners who are passionate about long term, consistent, local support for you and your buildings.

Stay on top of regular advances in technology with supplier-certified, multi-lingual online educational videos, technical documentation, software updates, and advanced face-to-face classroom courses.

9 FACTORY-CERTIFIED SERVICE

8 TRAINING & SUPPORT

Ensure a strong level of interoperability by using open protocols which have third-party listing laboratories to verify adherence to your protocol's form and function.
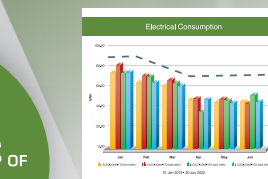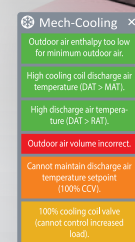
1 CERTIFIED OPEN STANDARDS

Enjoy the long-term benefits of suppliers who engineer a path forward to new technologies while remaining backward compatible without third-party gateways or hardware replacement.

7 BACKWARD COMPATIBLE

the ART of BUILDING SUSTAINABILITY

HVAC

Lighting

Security

Employ a single sign on (SSO) architecture with compliance to scalable credentialing architectures and secure tunneling methodologies such as BACnet secure networks (B/SC).

2 SECURE DATA

B/SC

B/SC

Select lifecycle-centric manufacturers who minimize the negative impacts of waste with long-term warranty and repair services while adhering to WEEE, RoHS and LEED directives.

6 MINIMAL WASTE

Specify integrated FDD (IFDD) that delivers real-time fault detection, step-by-step root-cause diagnostics while using all your existing cabling structures, including twisted-pair networks.

3 INTEGRATED FAULT DETECTION & DIAGNOSTICS

Mech-Cooling ×
Outdoor air enthalpy too low for minimum outdoor air.
High cooling coil discharge air temperature (DAT > MAT).
High discharge air temperature (DAT > RAT).
Outdoor air volume incorrect.
Cannot maintain discharge air temperature setpoint (100% CCV).
100% cooling coil valve (cannot control increased load).

4 OWNERSHIP OF ANALYTICS

5 MOBILE-CENTRIC EXPERIENCE

Create better-connected spaces with real-time access to occupancy, lighting, ventilation, and thermal comfort levels, using a holistic single app on the occupant's mobile device.

Insist on timely analytics for all stakeholders with complete control of formatting and scheduling while retaining full ownership of your data and the reports generated.

Better by design™

DELIVERING SUSTAINABILITY

Reliable Controls is a vertically-aligned building IoT vendor delivering innovative, quality products and services in all nine of the sustainability elements. More than just a highly-integrated HVAC, lighting, and security system, Reliable Controls and the Reliable Controls Authorized Dealer network have the products, the know-how, and the vision to help you stand at the helm of sustainability for generations to come.

Reliable® controls

9
Reliable® controls Authorized Dealer
FACTORY CERTIFIED SERVICE

8
OPERATOR CERTIFICATION PROGRAM
TRAINING & SUPPORT

1
ASHRAE BACnet®
CERTIFIED OPEN STANDARDS

HVAC

the ART of BUILDING SUSTAINABILITY

Lighting   Security

Gen-4

Gen-3

Gen-2

Gen-1

7
over 35 YEARS of backward COMPATIBILITY
BACKWARD COMPATIBLE

2
RCRemoteAccess®
SECURE DATA

B/SC

B/SC

6
5yr WARRANTY
MINIMAL WASTE

3
IFDD FlexTiles®
INTEGRATED FAULT DETECTION & DIAGNOSTICS

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4
RCReporter®
OWNERSHIP OF ANALYTICS

Electrical Consumption

5
myControl®
MOBILE-CENTRIC EXPERIENCE

The power, flexibility, and sustainability of the Reliable Controls®-system™ is demonstrated in buildings all around the world.

"The Reliable Controls-system is easy to understand. It controls better and tighter than the other products I've seen."

"Economizing is important. We're saving a lot on electricity. It has that flexibility where you can just keep adding onto it. You just have to monitor the system and it looks after all the details."

Rick Smith, West Pender Property Group

Designed and Manufactured in Canada