

## SOLUTION BRIEF

Intel® IoT  
Smart Buildings



# An Open, Secure, and Scalable Smart Building Solution That Is Easy to Deploy

**KMC Controls delivers a strong ROI building automation solution with advanced technologies from Intel and Dell—providing customizable control of multiple buildings with diverse systems.**

“IoT connectivity is the future of building automation.”

**Nate Kehr**  
KMC Marketing Manager

### Addressing Operational Challenges

Systems integrators and building managers designing and deploying solutions to handle building operations, maintenance, and management face some significant challenges. The fragmented nature of the building equipment industry is the legacy left by countless closed and proprietary systems. No two building automation solutions are the same, and each deployment needs to address a unique set of legacy equipment requirements, from the tenant's industry to regional weather patterns. It often takes specialized hardware, software, and training to construct a solution.

With owners and tenants demanding greater insight and control of their buildings, systems integrators are under pressure to deliver a holistic automation system. The ultimate aim is to augment existing systems and bring them up to their full operational potential. In most cases, this means moving away from proprietary systems and avoiding unwanted dependency on a single service provider or long-term service contract.

What is needed is an open building automation platform capable of integrating the numerous building systems that today lack the connectivity and interoperability to work together. KMC Controls, partnering with Intel and Dell, helps systems integrators make this a reality through its easy-to-deploy hardware and software building blocks. The solution helps building managers conserve energy through improved building visibility and manageability, and provides a quick return on investment. KMC Controls uses Internet of Things (IoT) technologies to enable building systems to communicate and share data with each other in the cloud.



#### 1. OPEN

Hardware, software, and products that integrate seamlessly with the existing infrastructure.

#### 2. SECURE

Industry-leading data security technology to protect building systems and user networks.

#### 3. SCALABLE

The flexibility to create affordable solutions for single buildings to large campuses.



**Figure 1.** Business imperatives for systems integrators deploying smart building technologies

## End-to-End Building Automation

Building managers need to provide their customers with competitive management and automation services in order to provide best-in-class climate control, energy savings, and maintenance. Converting existing buildings to control systems can be extremely challenging and costly because of the variety of legacy equipment and customer expectations.

KMC Controls offers an entire IoT automation platform that makes it possible for systems integrators to quickly and efficiently install building controls for lighting, temperature, humidity, and CO<sub>2</sub>, while also managing equipment health and optimizing maintenance costs. This platform is an end-to-end solution that can be easily installed and quickly configured by system integrators.

According to Markets and Markets Inc., a business research firm, the total building automation and controls market is expected to reach US \$55 billion and increase at a compound annual growth rate (CAGR) of over nine percent through 2020.<sup>1</sup> Part of this growth will come from “the convergence of IoT with information technology and building automation, driving the building automation and controls market into new application areas.”<sup>1</sup>

## Remote Management from Edge to Cloud

KMC Commander\* is a complete IoT platform for building automation that forms an end-to-end solution, from sensors and controllers (edge devices) to cloud-based, remote management applications. Figure 2 shows an example of the remote visualization and control supported by a cloud-hosted, mobile application-based architecture with secure data access. The solution features embedded processing and security technology from Intel, engineering and design collaboration with Dell, and a tagging and visualization software framework from J2 Innovations.



Figure 2. Visibility and control for building owners

## Vertical Industry Use Cases

For nearly 50 years, KMC Controls has been helping facilities achieve higher levels of energy efficiency and indoor environmental quality by automating and controlling building systems.

With the development of KMC Commander, KMC Controls is even better able to address the needs of various facilities and vertical markets, including:

- **Education:** Remedy poor ventilation, inadequate and insufficient lighting, lack of centralized control, etc.
- **Healthcare:** Apply controls system upgrades, including start-stop device management, load shedding during peak hours, trending, and reporting.
- **Retirement Communities:** Provide access to energy consumption information via an easy-to-use Web interface.

See case studies at [kmccontrols.com/products/projectshome.aspx](http://kmccontrols.com/products/projectshome.aspx).

## Open, Scalable, Secure, and Cost-Effective

KMC Controls sets itself apart from other building automation solutions by offering systems integrators an open, scalable, and secure solution they can quickly deploy. A KMC Controls deployment will typically require less than half the resources of a competitor's system. Specially designed for the fast-changing building automation industry, the solution addresses three key demands:

- **Open platform:** Systems integrators can target a wide range of vertical markets by avoiding undue dependency on a single proprietary system or service provider. At the same time, KMC Controls supports multiple proprietary and standard protocols, like BACnet\* and Modbus\*. This enables quick network access to building system performance data.
- **Scalability:** Intel provides KMC access to a scalable roadmap of products that power devices at the edge of the network, from the energy-efficient Intel® Quark™ SoC to high-performance Intel® Xeon® processors. By seamlessly scaling up the Intel® processor family, KMC can protect existing applications and services, while also meeting changing market requirements at the right price point.
- **Security:** KMC integrates Intel's proven, innovative security solutions for systems, networks, and mobile devices. Through its hardware-enhanced security and a unique global threat intelligence network, Intel satisfies KMC's expanded requirements for trust, solution integrity, accountability, and privacy at every layer of IoT: device, connection, cloud, and data center.

### KMC Building Automation Architecture

A building automation application will typically require development in three areas, as shown in Figure 3. *Smart devices and sensors* are installed to manage building systems and collect data throughout the building. *Secure connectivity* from devices to cloud (or private data center) allows for the necessary data communications. *Control and visibility applications* running in the cloud provide the tools building engineers need to manage the building. KMC Controls supplies products in all these areas, enabling systems integrators to offer their customers a comprehensive and proven building automation solution.

KMC Commander is a building automation solution comprising a complete line of fully programmable digital hardware and intuitive software for local and remote Web-based facility management.

Key hardware and software components:

**KMC Conquest\***, a complete array of smart sensors, controllers, and devices, including:

- Smart sensors for temperature, humidity, occupancy/motion, and CO<sub>2</sub>
- Digital control products
- BACnet-to-Ethernet router and diagnostic tool
- Electronic actuators for damper and valve applications

**KMC Commander BX\***, an IoT gateway for device and system integration, featuring:

- Dell design based on the Intel® IoT Gateway reference architecture
- McAfee security software
- Multiple communication protocol support

**KMC Cloud\*** supports data storage, processing, and application hosting, providing:

- Device management
- NoSQL database
- Application integration and orchestration

**KMC Commander\*** incorporates solutions from edge devices to cloud with:

- Dashboards and reporting
- Work order and asset management
- Demand response and fault detection

### Open Platform

KMC and Intel are committed to providing the most open platform possible. KMC is a leader in open system thinking and design, which led them to choose Intel as a partner. Intel offers open, future-proofed solutions that can be flexibly adapted to meet varying application requirements.

Openness supports mobility, another important benefit. Intel technology frees KMC's systems to be more easily managed remotely from a kiosk or a mobile device, such as a phone or tablet. This gives owners faster access to maintenance data, which means greater system uptime, improved efficiency, and fewer service calls.

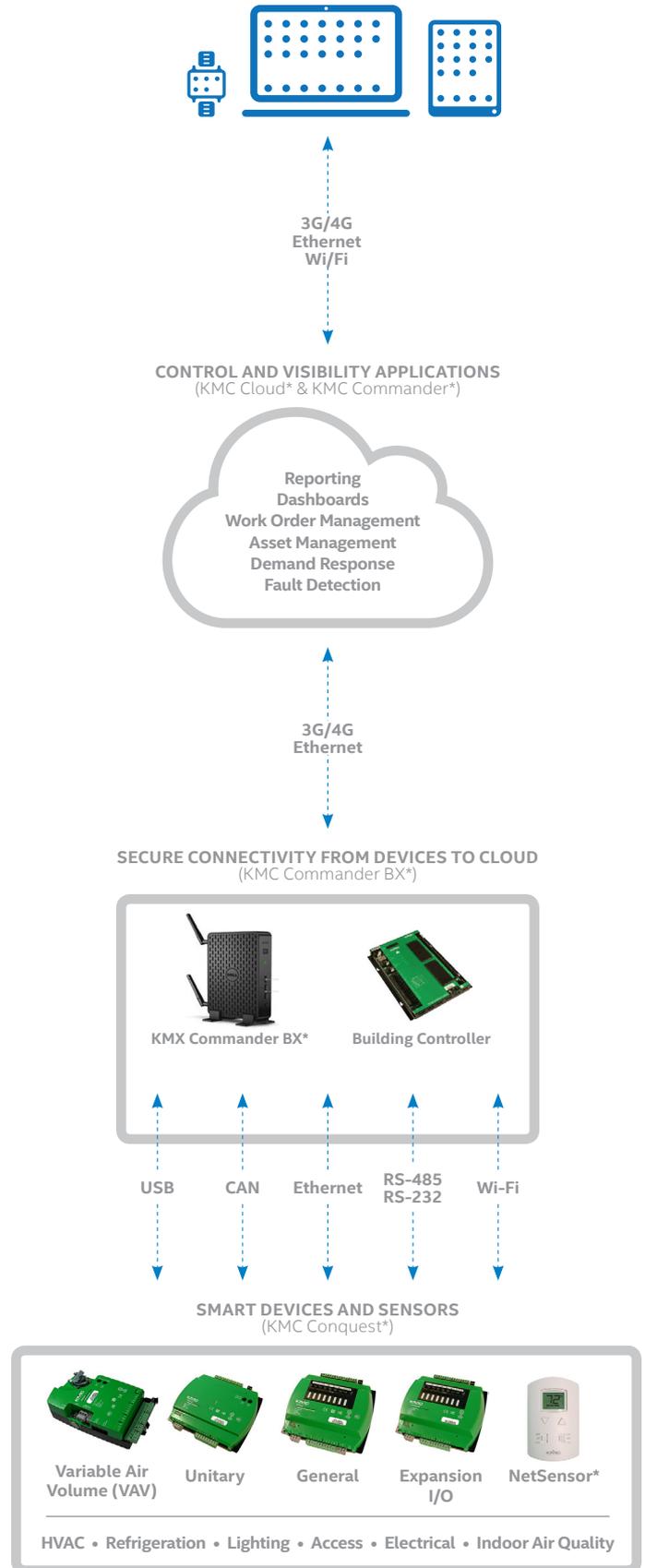


Figure 3. KMC Controls building automation architecture.

## Scalable

KMC system architecture has the ability to scale up within a building and scale out across and among disparate and remote properties and systems. This means KMC can easily integrate peripheral systems, including lighting, metering, building access, and others.

Through integrated, scalable hardware and software solutions from Intel, KMC is able to accelerate the development and deployment of IoT in its customers' buildings. As a result, KMC solutions have the power to capture, catalog, and analyze building data, which unlocks the possibilities of the smart building—without compromising existing infrastructure investments. KMC Commander offers a cost-appropriate solution for data collection and aggregation for buildings and portfolios of any size and type.

## Secure

Intel® Security solutions span hardware and software, making possible the true end-to-end security that IoT and smart buildings require. With KMC Commander BX based on the Intel IoT Gateway, KMC customers can securely and seamlessly connect, aggregate, filter, and share data from the edge to the cloud. The secure, scalable gateways enable building owners to easily manage assets and data from anywhere, anytime in a secure environment.

## Summary

The combination of IoT technologies, intelligent gateways, actionable data, and end-to-end security represents the foundation for a truly smart building, one benefiting from predictive analytics and preventative maintenance for building equipment. KMC, working with Intel and Dell, provides systems integrators a fast path to deployment and helps them cost-effectively bring new capabilities and savings to their customers. This solution improves building visibility and manageability, thus enabling building managers to conserve more energy and realize a substantial return on investment.

## For More Information

For more information about smart building solutions from KMC Controls, visit [kmccontrols.com](http://kmccontrols.com).

To learn more about Intel solutions for smart buildings, visit [intel.com/iot/smartbuilding](http://intel.com/iot/smartbuilding).



1. Markets and Markets Inc., "Building Automation and Controls Market by Product Segment (Lighting control, HVAC control, Security and Access Control), Application Vertical (Residential, Commercial, and Industrial), and Geography (North America, Europe, APAC, and ROW): Global Forecast to 2020," November 2014, <http://www.marketsandmarkets.com/PressReleases/global-smart-homes-market.asp>.

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## SMART SCHOOL PROMOTES LEARNING

Giséle-Lalonde Secondary School in Orléans, Ontario, Canada, is one of the first IoT-ready schools in North America. The school is looking to reduce energy consumption and improve student performance by:

- Metering water and natural gas
- Benchmarking kilowatt hours (kWh) per student
- Actively measuring and managing carbon dioxide levels
- Tracking occupancy in real time
- Creating a safer, more comfortable, and highly productive learning environment for students

### Bringing Together the Right Partners

KMC Controls systems integration partner Lar-Mex planned and executed the school's IoT upgrade. The existing building automation systems are being augmented with the addition of utility metering. Proprietary communication protocols are integrated with the KMC Commander BX\* gateway, based on the Intel® IoT Gateway reference architecture. Data on the health and performance of the building is then aggregated and analyzed in the cloud, and made available to building administrators via mobile applications, as well as to building occupants via educational dashboards displayed on kiosks within the school.

## HEALTHCARE FACILITY CONSERVES ENERGY

The Greencroft Community is a continuing-care retirement community residing in a new two-story building. In order to develop a strategy to conserve energy, the healthcare facility wanted to monitor:

- Energy delivered in the last: hour, week, and 30 days
- Energy cost per square foot
- Resident average: demand, consumption, and yearly cost
- Resident consumption versus the U.S. average

### Accessing Energy Reports

KMC Controls deployed its KMC Commander\* solution to control two rooftop units and around 110 variable air volume controllers. The on-site operator typically uses his PC to access HVAC and energy consumption information from the KMC-hosted cloud service.