

Controlling Your Green Building



Higher Energy Efficiency

Lower Operating and Maintenance Costs

Better Indoor Air Quality

Greater Occupant Comfort and Productivity



Why Go Green?

Why Green Is Good

Green, the iconic color of plants, is the symbol for sustainability in buildings. Green is good for the triple bottom line (people, planet, and profit). Green buildings are:

- Good for **occupants** (healthier and more comfortable working space)
- Good for our **environment** (reduced resource depletion and higher sustainability, which helps preserve the earth for future generations)

- Good for **business** (higher employee productivity, lower energy and life cycle costs, higher client attraction/retention, higher resale value, and enhanced public relations)

A significant goal for “greener” buildings is reducing energy and water usage while enhancing the quality of indoor air. This goal is attainable largely by optimizing the building’s automation system.



Controls and Building Certifications

Although any building may be built or retrofitted with various enhanced green characteristics, **significant advantages exist in obtaining building certification by one of the “green” organizations**, such as ENERGY STAR® and the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) Green Building Rating System. A building's certification provides proof of its triple bottom line.

KMC Controls has been a member of the U.S. Green Building Council (USGBC) since the early days of the organization. The USGBC is a non-profit organization committed to a prosperous and sustainable future for our nation through cost-efficient and energy-saving green buildings. According to the USGBC, buildings in the United States are responsible for 39% of CO₂ emissions, 40% of energy consumption, 13% water consumption, and 15% of the gross domestic product per year, making green buildings sources of significant economic and environmental opportunity.

Green buildings are found in many sectors, and KMC products have been minimizing energy use while optimizing occupant comfort in many government, school, hospital, hotel, office, and other commercial buildings for decades. To help you obtain green certification as well as ensure that your facility operates as it was initially designed, KMC provides a comprehensive approach to automating systems within commercial and institutional facilities. Our systems can manage heating, ventilating, and air conditioning as well as smoke control, lighting control, daylight harvesting, rainwater harvesting and landscape irrigation, monitoring/management of power use and (alternate energy source) generation, data collection with logging and trending, and a host of other applications.



**Merry Lea Environmental Learning Center,
Wolf Lake, Indiana (Platinum LEED Certified)**

Whether your green building is small or large, KMC's products can play critical roles in attaining certification in the LEED, ENERGY STAR, or other ratings systems. For example, KMC controllers, sensors, and software can play key roles in satisfying the prerequisites and credits in the Energy and Atmosphere (constituting 25% of the total points) and Indoor Environmental Quality (22% of the total) categories for LEED New Construction and Major Renovation.

When attaining (the highest) LEED Platinum certification, the **Merry Lea Environmental Learning Center of Goshen College** had KMC direct digital controllers, sensors, and software working together to monitor and log building system performance factors such as heat pump fluid temperatures, current generated by photovoltaic arrays and a wind turbine (to get credit from the utility company), as well as other environmental conditions.

When attaining the ENERGY STAR label, the **Wachovia Bank Building in Tampa Florida** used software and over 300 BACnet controllers manufactured by KMC Controls. The HVAC controls retrofit, which replaced an obsolete system, provided an additional monthly energy savings of 10% over the previous system. In addition to energy savings, it also included CO₂ monitors to enhance the air quality and help meet qualifications to pursue LEED Gold certification.

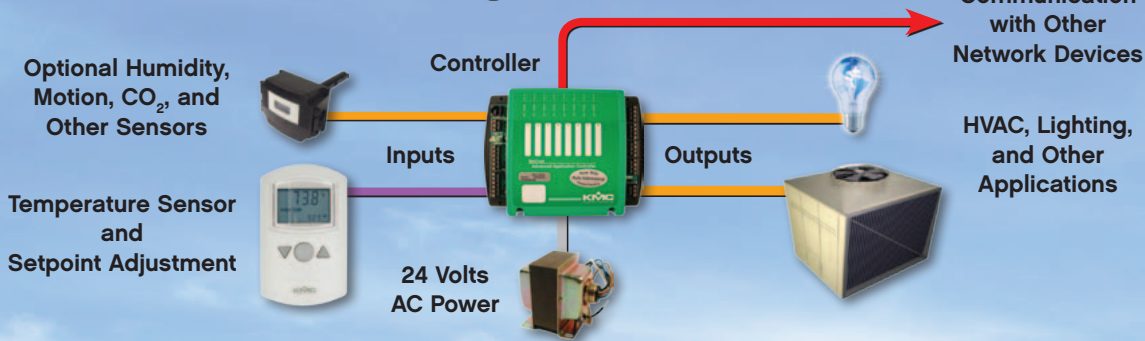
On the following two pages are visual examples of KMC's controls used within different networks of a large building automation system.



**Wachovia Bank Building, Tampa, Florida
(ENERGY STAR Labeled and pursuing LEED Gold)**

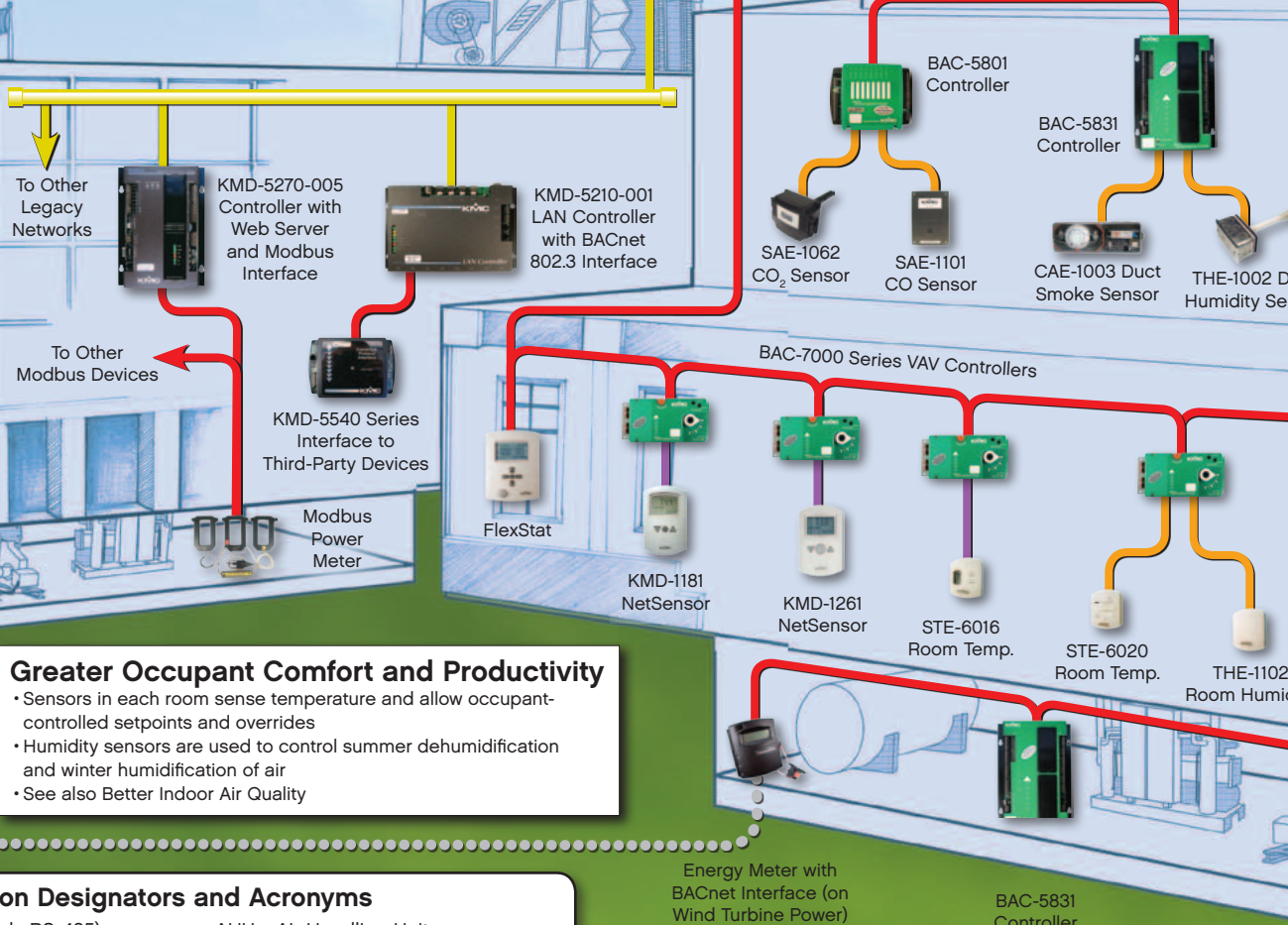
Building Automation Behind the Scenes

Basic Building Automation Controls



(Output devices not shown include actuators, valves, relays, triacs, and variable frequency drives. Configurations shown are only a few of many possible options.)

Mixed Networks



Greater Occupant Comfort and Productivity

- Sensors in each room sense temperature and allow occupant-controlled setpoints and overrides
- Humidity sensors are used to control summer dehumidification and winter humidification of air
- See also Better Indoor Air Quality

Connection Designators and Acronyms

- | | |
|---|--|
| — EIA-485 (formerly RS-485) | AHU = Air Handling Unit |
| — Ethernet TCP/IP | FCU = Fan Coil Unit |
| — General wiring to terminals | LAN = Local Area Network |
| — KMC modular cables/connectors | OAT = Outside Air Temperature |
| — Modem/EIA-232 (formerly RS-232) | PID = Proportional, Integral, Derivative |
| — USB (temporary connection to PC) | RTU = Roof Top Unit |
| ••••• (Wind or solar power) | VAV = Variable Air Volume |

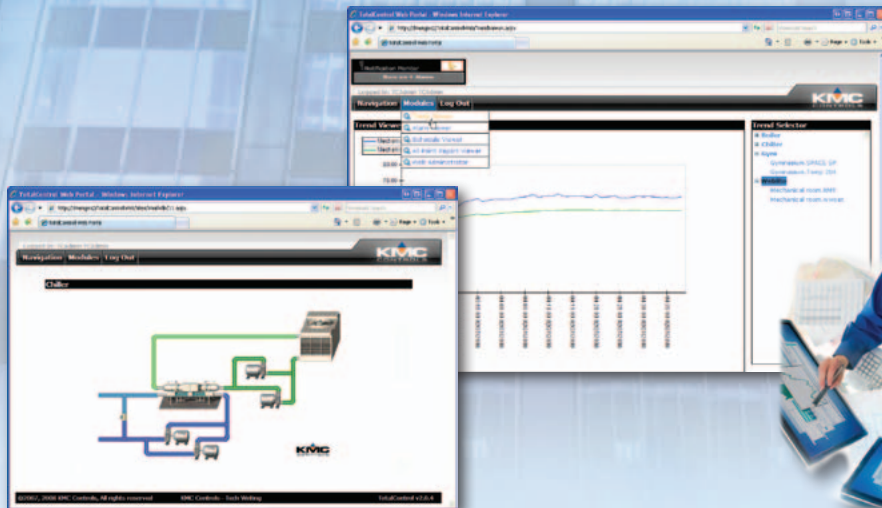
For brief explanations of terms, see KMC's Green Building and Controls Glossary (SB-046)



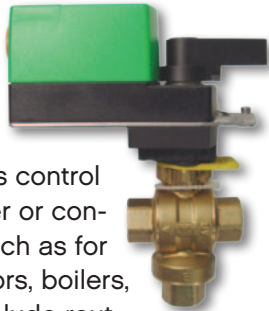
What KMC Can Do for You

Putting Control at Your Fingertips

Whether you want to just adjust the setpoint in your office or manage the entire building automation system, we have the products for you. For building automation applications, our digital hardware controls (as shown on the previous spread) include our proprietary KMDigital and our interoperable, open-systems BACnet controllers. (For support of older systems, we also offer analog electronic controllers and pneumatic controllers.) Software for the digital control systems includes WinControl® for our proprietary line of controllers and BACstage® for the BACnet controllers. Our TotalControl™ software integrates control and monitoring of these and other systems.



For monitoring thermal comfort, air quality, lighting requirements, and energy usage, the “eyes and ears” of controllers are switches and sensors that detect temperature, humidity, pressure, air flow, CO₂, CO, smoke, occupancy, and electrical current. Actuators, valves, relays, and other output devices (not shown on the previous spread) perform necessary electronic, electrical, and mechanical actions (as directed by the controllers). These actions control the flow of air or hot/chilled water or control external electrical circuits such as for lighting, fans, pumps, compressors, boilers, and chillers. Other KMC tools include routers, repeaters/isolators, surge suppressors, computer interfaces, transformers, power supplies, enclosures.



For stand-alone applications and small buildings, a “Tier 2” network can sustain operations without a dedicated computer or LAN, but for networking capabilities, controllers can be interconnected via economical wiring. When needed, technicians can use convenient on-site network connections or use dial-up modem connections to check status or change programming. Larger commercial building installations typically use networks of Tier 2 controllers within each zone and also interconnected zones of “Tier 1” controllers. For campus-type or geographically dispersed applications, Internet solutions connect systems and workstations. Operators can monitor and control the system with either browser-based or directly connected workstations.

About BACnet

Building automation controls are increasingly using BACnet, the only communications protocol that was designed for open-system interoperability and specifically intended for building systems. Interoperability means that products from different manufacturers can communicate with each other and work together. The concept of interoperability blends well with the integrated project design of LEED and other green approaches.

An open system helps reduce future risk. If a vendor for an installed proprietary BAS goes out of business, future maintenance and upgrades might require the old BAS to be torn out and entirely replaced by something new. Interoperability, however, means that new can build on old, helping future-proof life-cycle costs.

For more information about how KMC BACnet products can help you, see the Native BACnet Building Automation Solutions Brochure (SB-008).



Buying KMC Products

Depending on your situation, you can purchase and arrange for installation and service through a variety of channels:

- **Authorized Installing Contractors (Dealers)**—These independent controls contractors have access to the complete line of KMC products. They can design, install, and service new construction or modernization projects as well as provide operational training.
- **HVAC Wholesalers**—They have access to the analog electronic and pneumatic portions of our product line, including controls, actuators, and valves. They offer the convenience of numerous locations and available inventory.
- **Authorized System Distributors**—They offer all the advantages of standard wholesalers but also offer our BACnet product line. They typically offer in-house design services, training, and expert advice.
- **Original Equipment Manufacturers (OEM)**—Even if a product has another name on it, it could still be one of ours. We have partnered with the biggest names in equipment manufacturing. They come to us because of our decades of reliable service and user-friendly processes.

For additional information about contacting a supplier, see the KMC Controls web site.

About KMC Controls and Additional Resources

KMC Controls, an ISO-9001 registered company, is the only privately held manufacturer of a full line of HVAC and building automation controls in the USA. At KMC Controls, people and the planet matter, and in the long-term, what's good for people and the planet profits everyone. Join us in the sustainability revolution!

For more information about KMC Controls, see our Corporate Capabilities Brochure (SB-052).

For definitions of green building terms, see our award-winning and very popular pocket-sized Green Building and Controls Glossary (SB-046).

For the latest information about KMC Controls and sustainable buildings as well as downloadable PDFs of the mentioned documents, see the award-winning KMC Controls web site (www.kmcccontrols.com).





19476 Industrial Drive
New Paris, IN 46553, U.S.A.
Telephone: 877.444.5622 (574.831.5250)
Fax: 574.831.5252
Web: www.kmccontrols.com
Email: info@kmccontrols.com

This brochure (Rev. B) won awards in the 2011 APEX Awards for Publication Excellence, sponsored by Communications Concepts, as well as in the 2010-2011 publications competition sponsored by the West Michigan Shores Chapter of the Society for Technical Communication (STC).

BACstage, FlexStat, and TotalControl are trademarks and KMC Controls, KMDigital, WinControl, and NetSensor are registered trademarks of KMC Controls, Inc. All other products or name brands mentioned are trademarks of their respective organizations. Page 3a image is courtesy of Merry Lea Environmental Learning Center of Goshen College, Goshen, Indiana (www.goshen.edu/merrylea/). Page 3b image is courtesy of Wachovia Bank, Tampa, FL (www.wachovia.com).

© 2011 KMC Controls, Inc. 09/11 **SB-048C**

This document is printed, using ink that is environmentally friendly, on recycled (30% PCW and 55% total recycled fiber) paper.

