

*Volume 1, Issue 1*

**Building  
Better with**

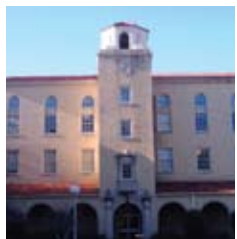


# **CORNERSTONES**

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**Building Better with**

A blue curved arrow graphic that starts from the left and points towards the right, ending in a series of three arrowheads.

**Make  
BACnet  
International  
The Cornerstone of  
YOUR SUCCESS**

A green curved arrow graphic that starts from the left and points towards the right, ending in a series of three arrowheads.

BACnet International encourages the successful use of the BACnet protocol in building automation and control systems through interoperability testing, educational programs, and promotional activities.

BACnet International community membership includes a who's who list of top tier companies involved in the design, manufacturing, installation, commissioning, and maintenance of control and other equipment that use BACnet for communication.

Does your company have a passion for controls excellence - Then join BACnet International. Visit our web site for a comprehensive list of membership benefits.

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A silhouette of four people standing on a balcony or walkway, looking out over a city skyline at night.

# Welcome!

Welcome to the inaugural issue of BACnet International's quarterly journal. Education is a core part of our mission so we hope to make this publication a regular source of information and inspiration for current and future members of the BACnet community. Through case studies, expert commentary and product information we will provide a high-level perspective on BACnet implementation. Our goal is to broaden the discussion about BACnet by moving beyond technical information and including "day in the life" examples of owners and operators who find value in the open, collaborative world of the BACnet community.

This is an exciting time to be a part of BACnet International. We added 17 new corporate members last year and over 1000 new individual members. To address their needs we launched several information and education initiatives in addition to this journal. We started up a web seminar series last June. The first, titled, "BACnet to the Future" focused on presenting BACnet to non-technical people in a way that they could understand its value as well as its limitations. The webinar described three levels of BACnet integration and highlighted specific case studies to clarify the BACnet value proposition. We also launched a new conference initiative last year as we embedded the annual BACnet International conference in the Facility Decisions Conference and Expo. Like the webinar, the conference was designed to present BACnet to people who are more interested in building value for their organizations than getting involved in the technical details of the BACnet specification. To round out our education agenda for the year, in October we co-sponsored the first BACnet China conference in Beijing.

BACnet International is committed to providing you with quality information that helps you stay connected and alerts you to opportunities for BACnet-related education and professional growth. If you are already a member, thank you for your support. If not, consider joining today. In either case, visit our website ([BACnetInternational.org](http://BACnetInternational.org)) for the latest updates and opportunities.

Sincerely,



Andy McMillan  
*President, BACnet International*  
*President, Teletrol Systems*



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## The AspectFT HVAC Energy Control Family Manufactured by American Auto-Matrix

Using open standards, such as BACnet, the AspectFT Energy Control family is designed to give users control of their facility through open web standards. Using most any standard web browser, users can access and make changes to their building from anywhere in the world. In addition, energy

control and manipulation can be accomplished with on-board integration through protocols such as BACnet IP, MS/TP, and Ethernet. Other features include access to data through RSS feeds, Twitter®, MySQL®, and other common protocols. For more information please visit [www.whatsyouraspect.com](http://www.whatsyouraspect.com).

### CASE STUDY:

#### Melbourne Cricket Ground

Redeveloped in time for the 2006 Commonwealth Games to seat more than 100,000 spectators, the MCG ([www.mcg.org.au](http://www.mcg.org.au)) is now one of the largest sporting stadiums in the world. With its renowned atmosphere, history of grand finals and test matches, the MCG is a sporting arena that has commanded the affection of generations since 1853.

Installing over 560 American Auto-Matrix Native BACnet controllers, AE Smith ensures MCG sport fans enjoying the amenities provided by the 180+ corporate boxes, sixteen dining rooms, ten bars, 157 cool rooms and freezers, six chillers and boilers can worry about the game and not the temperature of their beverages, bathrooms, or boxes.

#### Interesting fact:

At 210,000 people long, the waiting list for someone to become a member of the Melbourne Cricket Club is 12-15 years long.

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**Each edition of Cornerstones  
will explore the working world  
of facility professionals.**

## KEYSTONES

# AN INTEGRATED MISSION

Twenty acres of ornamental landscaping just 5 miles from downtown Dallas, Texas is home to the Dallas Theological Seminary ([www.dts.edu](http://www.dts.edu)). As its name implies, DTS is a Christian-based learning institution. Four words summarize their focus: "Teach Truth. Love well." More than 2000 students take advantage of DTS programs, mostly through the Dallas campus. Remaining students connect with DTS online or through one of 6 extension offices.

That's an aggressive mission to say the least. The campus consists of 15 buildings, the oldest of which dates back to 1927. The two largest facilities, totaling just under 300,000 square feet, serve housing purposes. From a building system perspective, the campus is comprised of distributed hydronic chiller/heating systems, managed by a Tridium Niagara framework. Housing units are climatized with a water source heat pump system and water-cooling towers for the condenser loop.



The mechanical systems do occupy much of a typical day's attention for Kevin and his team. These systems can also represent the biggest headaches his team encounters routinely. "My maintenance staff often begins their day by checking for alarms, before they ever leave home. We need to be able to diagnose any problems with the HVAC systems so issues can be resolved prior to everyone arriving. Our biggest challenge is the lack of reliable HVAC equipment. Most of our systems are over 20-years old and they are run very efficiently. That means that economically phasing them out is not possible."

Still, Kevin notes optimism in approaching both budgetary and mechanical challenges. "We are conducting long-term capital planning, with holistic facility renewal objectives," he says with a smile, "even in the midst of numerous failures."

On a more positive note, Kevin and his team have played instrumental roles in sustainability initiatives at DTS. These initiatives include everything from recycling to energy efficiency gains.





## From owners to operators, we'll use this column to examine the challenges they encounter and the successes they celebrate.

For example, while the seminary has recycled for many years, the program was recently expanded in terms of items collected and simplified as well through comingled recycling containers. Building occupants empty their own office recycling and trash in larger centralized containers in hallways. Their commitment to environmental stewardship has also led to a phasing out of all CFC usage on campus, the purchase of renewable energy, a commitment to low VOC material purchases, providing free transportation to and from the nearby public transportation hubs, and partnering with consultants and contractors to meet LEED®-related requirements for the construction of one campus facility, Washington Hall.

"I feel that much of the talk of sustainability is politically motivated," Kevin says. "Despite that, we have adopted sustainable practices to the benefit of our operations, particularly in terms of energy-efficiency. By automating the mechanical systems we have

garnered significant energy savings. And, we have been pleased to find both energy efficient and affordable products."

What does Kevin look for in product and service providers? "We have had problems with companies offering "proprietary" products and services in the past," he says. "They do great with the big purchase. But then you can't get them to come back to provide smaller services or they will charge three times what it should cost. As a result, we look for products and services that can be provided by 3 to 4 companies. Fortunately, given that our school is located in a major city, that's not much of a problem."

Kevin does anticipate continued resource constraints for 2010 but he and his team, which includes 5 professional staff members and 25 full and part-time associates, do feel up to the task. It is, after all, their ministry.

**Kevin Folsom** runs the Facilities and Plant Operations team (FPO) at the seminary. He describes the purpose of his team in a truly integrated fashion to the seminary's purpose.

"Students attend DTS from over 50 nations and from here we send them worldwide to build the body of Christ," he says. "Our physical facilities touch each of these individuals in ways that can foster an environment for biblical learning and fellowship. We therefore, consider it our mission and our ministry to provide services in custodial, maintenance, facility renewal, catering, event services, utilities management, construction, and leadership with environmental consideration, all in order to promote effective learning."

The formal department mission statement echoes this approach: Provide DTS with a physical environment conducive for the preparation of godly servant-leaders through a team of individuals who themselves exemplify these characteristics combined with facility management professionalism. -Colossians 3: 23-24



*Kevin Folsom, Director of Facilities and Plant Operations, Dallas Theological Seminary*

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## BACnet "LEEDs" Energy Consumption Down



Situated on the expansive campus of The Ohio State University, lies the new home of central Ohio 4-H. It is the Nationwide and Ohio Farm Bureau 4-H Center. This facility houses conference and meeting rooms, training facilities, offices for youth development faculty and staff, and additional work space for extension agents, volunteers, and 4-H members.

Monitoring and controlling energy usage, as well as an inherent desire to make the building as green as economically feasible, was a primary concern for the owners. Accordingly, BACnet® was specified as the preferred communications protocol for the mechanical systems. LEED certification also became a driving force for the project.

Thirty-four WaterFurnace® ground-water heat pumps are fed tempered air from one of three variable volume air handling units, powered by Yaskawa® variable frequency drives. The heat pumps have factory-installed BACnet controllers from Johnson Controls®. System management is made possible through the TotalControl™ operator workstation from KMC Controls® as well as a KMC BACnet building controller and two Advanced Application Controllers. These controllers also manage the CO2 levels and humidity levels. Discharge air temperature of the air handling unit is regulated



by use of a heating/cooling coil. Coil water is regulated by water-to-water heat pumps, which share a common ground loop. The ground loop features an innovative aspect that proved to be a great aide to energy efficiency. It is a 3-way bypass valve to increase efficiency under certain conditions.

W.E. Monks and Company has tracked energy consumption since the building opened in February of 2008. In its first year of operation the facility's actual energy usage was 31,386 BTU/GSF/YR. This represents about 1/3 the average for commercial buildings in the U.S. In addition, the building's actual energy usage cost is \$1.00/SF or 12.5% of what other OSU buildings pay for utilities on an assignable square foot basis (\$7.97 for FY 2008). Interestingly, for all building types, only vacant buildings use less energy, on average, than the 4-H Center!

Allen Auck, Building Manager of the 4-H Center, couldn't be happier with the outcome: "All our project goals have been met with a beautiful and comfortable facility. We've been LEED certified and now serve as a showcase for other OSU buildings." Allen continued by commenting on the work of the controls contractor, Air Control, Inc., a KMC Controls authorized dealer: "Air Control and their team are very easy to work with, responsive, and did a great job on the installation and integration. I came to rely heavily upon them. And, we also really like the KMC product. I found it very simple to use and it operates as robustly as it was touted."







*In touch* with your space ...

whether you're there or not

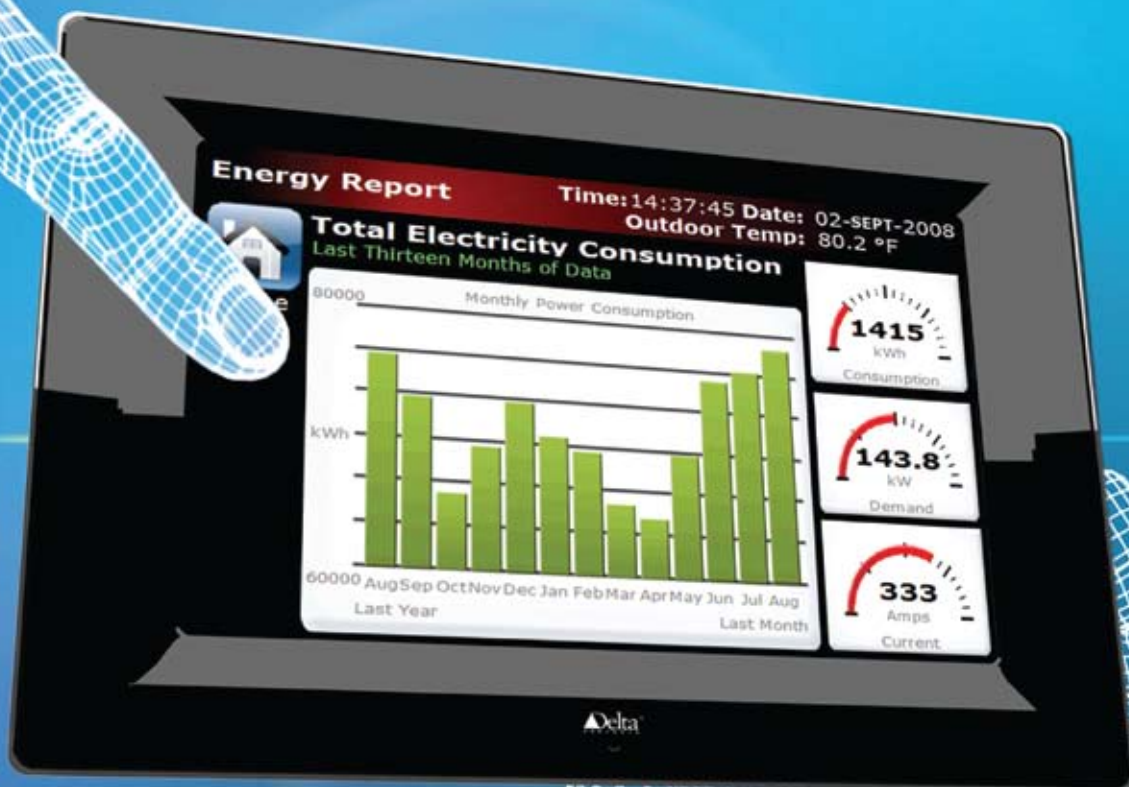


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Another innovative design from the world's BACnet leader.

With Delta Controls' new touchscreen, operators are able to monitor and manage building systems from any wall or room in the building. It's easy to customize 3D-animated graphics to depict floor plans, air handlers, boilers and chillers. Our seven-inch diagonal color screen makes it simple to change occupancy schedules, adjust temperature setpoints and more. It connects to your facility via BACnet® over Ethernet. Conserve energy usage, reduce operations costs and maintain occupants' comfort—all at a finger's touch.

For an animated demonstration visit [www.deltacontrols.com/hmi](http://www.deltacontrols.com/hmi)

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# BACnet Integration at Loyola University

**John Mitro**

**East Coast Regional Sales Manager**  
*Delta Controls*

Loyola University Chicago is an educational facility steeped in tradition. Established in 1870, this highly respected nationally recognized learning center has expanded from humble beginnings to currently serving approximately 16,000 students. The educational disciplines include the areas of business, education, law, medicine and social disciplines provided in undergraduate, master's and doctoral program opportunities.

The different colleges are spread across three campuses in the Chicago area. This configuration presents a large facilities footprint of over 60 buildings as well as the challenges of managing the physical plant and energy needs of buildings diverse in age and construction, located in the heart of a large Northern mid west metropolitan city and straddling a major inland body of water.

As part of the Universities vision to expand and improve its physical plant environment in 2002, the decision was made to embrace and deploy the native BACnet protocol concept for future new construction as well as retrofit of facility mechanical and lighting systems.

The basis of the university wide building automation system has been built on Delta Control Native BACnet products, systems and ORCA™ operating software, designed and installed by independent contractor, Delta Controls – Chicago. Today, university engineers enjoy campus wide state of the art control over 30,000 physical I/O BACnet points. This large point count can be accessed via web based graphical user interface allowing monitoring and adjustment from any personal computer. In addition, the complete net work is wirelessly accessible to the staff through their PDA's, Blackberry™ and iPhone™ devices.



The Universities last major construction project; The R. J. Klarchek Information Commons building significantly relies on Delta Controls Native BACnet system to maintain the environmental and energy parameters required to operate this high performance green building.

Summarized, the Information Commons is a four story, 70,000 ft<sup>2</sup> bookless digital library. The architecturally striking building employs vast walls of glass to permit unprecedented views of Lake Michigan.

Maintaining the environmental comfort and energy design parameters of the various areas with regard to temperature, humidity, light levels and safety code requirements required the use and integration of many different HVAC and concepts and equipment. BACnet met the challenge.

Examples of this BACnet integration include control of motorized windows supporting natural ventilation, integration of window blinds and shade control system which is dynamically adjusted thru the Delta Control system employing celestial calculations of the sun position and input from the onsite weather station. These devices work in conjunction with the integration of more conventional environmental tempering systems.

The Universities decision to embrace Native BACnet and Delta Controls technology has provided them the flexibility to monitor and manage their building assets and operating costs in the cost conscious and client aware world we live in today.

For more about Loyola University Chicago or other BACnet Success Stories, please visit [www.bacnetinternational.org](http://www.bacnetinternational.org).

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Better by design



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Critical infrastructure device and network integration results in efficient building and plant operation, while conserving resources, maximizing returns on assets, and saving energy. With FieldServer gateways you can combine existing trusted devices and systems with new technologies and services – optimizing your building and process control environments. There is no need to compromise when FieldServer lets you tie it all together to meet the demanding performance and interoperability efficiencies of the future.



### Largest driver library in the industry

Drivers for building automation, fire alarm panels and process controls.



### Proven success

Thousands of installations with over 700 translation paths using over 80 protocol drivers.



### Built upon relationships

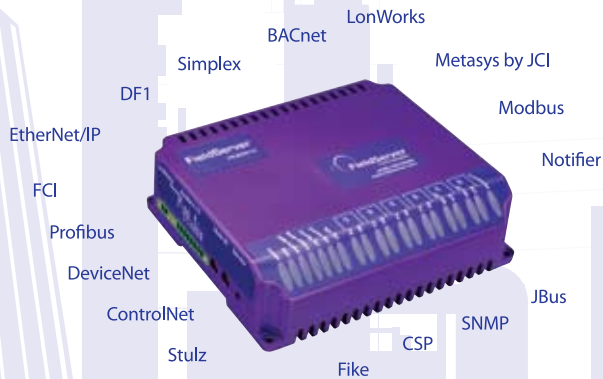
Developed and tested with the support of every device and protocol manufacturer.

### Tested integration

FieldServers are LonMark certified, Metasys compatible, BACnet compliant, and mission-critical tested.

### Interoperability is our business

FieldServer focuses on gateways for building automation, process control, and application integration.



[www.fieldserver.com/future](http://www.fieldserver.com/future)

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Go ahead. Think big. Or really small. No matter how simple or complex your project is, there's a **METASYS** system to manage the energy, comfort, and protection needs of your building. The leader in open systems, Johnson Controls delivers BACnet technology that can link all of your building systems with your IT systems locally and remotely.

And the **METASYS** Web-based architecture allows you to manage and monitor your facilities anytime, from anywhere. Providing visibility with mobility. Find out more about what **METASYS** can do for you.

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# PRODUCT UPDATES

## KMC Controls: TotalControl 3.1 is Major New Release

KMC Controls is announcing a major new version of its primary operator workstation software, TotalControl. Version 3.1 begins shipping in February with significant enhancements and over earlier versions and related improvements.



Enhancements include a greatly simplified installer to speed installation, Windows 7 compatibility, enhanced support for KMC's popular new FlexStat™ BACnet controller and sensor, and new Outlook-like scheduler. Other new features include an OPC driver as well as a Protocol

Gateway Service to improve interoperability. Numerous ease-of-use changes were also incorporated. On a related note, KMC announced the availability of Software Maintenance Plans for calendar year 2010 and beyond. The plan enables all installed sites to receive upgrades and patches for one, fixed price per year, facilitating better budgeting.

## KMC BACnet a "Top Products" Award Winner

Building Operating Management (BOM) magazine has recently recognized KMC with a 2010 Top Products award. The award references the patent-pending process that KMC developed to enable Automatic MAC addressing in BACnet MS/TP controllers. The January edition of the publication features these products, among others.



The BOM audience responded to product news by requesting further information online through the BOM website, facilitiesnet.com. Specifically, the KMC BACnet controllers ranked in the top 10% of the over 800 products featured on the web site between Sept. 30, 2008 and Oct. 1, 2009. The automatic MAC addressing process incorporated into these controllers eliminates the need for a technician to address individual controllers in the

field or for pre-addressed controllers to be installed at specific locations--a savings of labor for both documentation and installation.

## Veris CWLP -BACnet CO2, Temperature, and Humidity



The CWLP is a Native BACnet Application Specific Controller (B-ASC) that allows access to the three sensor measurements, setpoint slider, pushbutton override, and adjustable setpoint relay all over a daisy-chained twisted pair. The CWLP can also be locked out by the system to prevent local tampering and accidental calibration. Backed by Veris's 5 year warranty, the CWLP uses reliable self-calibrating NDIR CO2 technology and accommodates a 2% replaceable humidity sensor. The CWLP saves you time and money in installation and gives you confidence for the long term.

## Reliable Controls SMART-Space Controller



The Reliable Controls SMART-Space Controller (SSC) is a compact and fully programmable BACnet® controller designed for small point-counts that require a local LCD display and easy access to setpoint adjust, point override and schedule changes.

The controller can be configured for standalone operation, or can be networked on BACnet MS/TP for distributed applications. Standard features include up to 4 outputs and 3 inputs, a dedicated onboard temperature sensor, and optional features include any combination of occupancy sensor, humidity sensor, or real-time clock.

## Johnson Controls Field Equipment Controllers (FEC)

Johnson Controls has updated these BTL Listed Application Specific Controllers (B-ASC) with enhanced processing capability and an upgraded power supply to provide additional power for sensing devices. These changes support the increasing use of BACnet as the protocol of choice for electrical metering and central plant optimization



in addition to HVAC control. Used with the Metasys Building Management System, the Field Equipment Controllers all include both a BACnet Field Bus and Sensor/Actuator Bus. They support I/O expansion and a local user interface as well as wireless communication.



### Alerton's BACnet-based VisualLogic Display Sensor

Building automation pioneer Alerton today launched the BACnet®-based VisualLogic® Display (VLD), a VisualLogic controller with built-in humidity and temperature sensors and configurable touchscreen display. The VLD is an ideal solution for retrofits of thermostat installations and places where it is easier to install a single unit. A versatile, plug-and-play wireless addition provides door switch and occupancy sensor functions for customers whose décor cannot be marred with visible or otherwise intrusive cabling. The VLD enables powerful control of units, sophisticated, customizable displays, and a superb user interface.

with the building automation system. The Alerton system can integration with the hotel reservation and check-in systems with Alerton's BCM-HOTEL module. The powerful VLD can also operate as a standalone device and provides modes of operation that enable users to program control strategies based on occupancy or schedules.

### ABB introduces a new AC Drive tailor made for HVAC Pump & Fan applications

Called a model ACS320, ABB's new drive is designed for extremely fast installation and commissioning -- particularly for pump & fan applications. The addition to ABB's AC Drive family ranges from 0.5 HP to 30 HP (0.37 kW to 22 kW). The drive is fitted with a powerful set of features that fulfil pump & fan application needs -- complemented with advanced, energy efficient functionality built into every unit.

The drive has embedded Modbus RTU interface as standard (EIA-485/EIA-232). Well-known Modbus protocol, integrated and compact design simpli-

fies the commissioning of the drive. Also embedded as standard the most common HVAC protocols -- Johnson Controls N2; Siemens Building Technologies FLN; and BACnet (MS/TP).



### OEMCtrl's I/O Pro812u

OEMCtrl's, BTL Listed I/O Pro812u is a general-use controller that can be easily customized to meet any control sequence of operation. The I/O Pro812u is designed to connect to a Building Automation System (BAS) using BACnet (IP, Ethernet, ARC156, MS/TP, and PTP), and supports additional protocols. The point mapping to all of these protocols can be pre-set, so that the protocol and baud rates desired can be easily field-selected without the need for any additional downloads or technician assistance. The I/O Pro812u provides ample input / output capacity and supports multiple expansion boards.



OEMCtrl is a Platinum Level Sponsor of BACnet International.

### Blue Ridge Technologies BACnet Native Lighting Control

Blue Ridge Technologies, a leading manufacturer of integrated lighting controls and a Silver Sponsor of BACnet International, will display several new BACnet native lighting control products inside the BACnet International booth (#1151) at the 2010 AHR Expo. Blue Ridge develops and delivers BACnet-engineered lighting technologies for new and existing buildings that optimize lighting energy throughout the building life cycle. The company joined BACnet International to more closely align its products with the rapid developments in the open building automation standards area -- including BACnet.



Learn more [www.BlueRidgeTechnologies.com](http://www.BlueRidgeTechnologies.com) or [www.AnyBAS.com](http://www.AnyBAS.com). 800-241-9173

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