ISSN 2191-7825

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Issue 05

This Issue

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Cover picture

The Ohio State University, commonly referred to as Ohio State or OSU, is a public research university located in Columbus, Ohio. (page 4)

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The Ohio State University

Just over twelve years ago, the first BACnet® project was installed at The Ohio State University by Building Control Integrators (BCI).

The project, known as Evans Laboratory, was "live" to the world via BACnet/IP in early September of 2000. Since then, BACnet has become the adopted control's standard for the university. The original project included three main BACnet panels, manufactured by Delta Controls, with only 128 total inputs and outputs. Today, there are approximately 150,000 physical points throughout 65 facilities. It sounds simple enough, but this is not a "conventional" collection of I/O. The OSU BACnet network is currently comprised of 19 different vendors with connectivity to multiple system types. For OSU, BACnet has become the catalyst for advancing controls beyond the traditional front. For instance, the university currently uses BACnet to monitor and/or control non HVAC/Lighting systems such as generator banks, laboratory rooms, critical patient rooms, fire alarms, air quality, power consumption, clock systems and so forth.

While still in its infancy stages, it remains apparent that the inclusion of these systems will become more prevalent. Perhaps the most interesting aspect is that OSU's use of BACnet appears to be proportional to the evolution of the ANSI/ASHRAE standard itself. The Ohio State University employs the BACnet protocol to its fullest extent and benefits greatly from the standardization of systems. Moreover, the university continues to profit from the bidding process as several contractors/manufacturers are readily available with BACnet product. At this point, only BACnet Testing Labs (BTL) listed gear is being considered for future installations. Most recently, there seems to be greater focus on integration expertise – both internally and externally. For OSU, the service offering or system integration experience is equally important. Kelly Bloomfield, the OSU Director of Building Automation, states "The product reveals the inherent capacity to interoperate while the service/support reveals the integral capacity to utilize the product comprehensively. "Moving forward, OSU plans to implement a continuous improvement program centered on internal training and contractor validation". Once complete, BACnet for OSU will evolve to yet another level – promising even greater flexibility than previously imagined.

Retrofitting older buildings to BACnet is an ongoing process at OSU. Today, many of the smaller projects are handled internally with OSU's Building Automation Division. Not only have they adopted BACnet, they are purchasing the gear from BCI and then designing, installing, programming and commissioning projects themselves. For larger projects, they are bid in strict adherence to OSU's Standard Controls Specification which includes "A fully integrated and fully programmable BACnet building automation system (BAS)." In addition, to ensure they have the control and flexibility on their front end, OSU's standard specifically states that all new controls "provide a seamless interconnection to the existing Delta Controls central graphic workstation, and build Delta Controls standard and customized graphics displays in accordance with the existing formats."

BCI recently was awarded the Chemical Bio Molecular Engineering and Chemistry Building (CBEC) and work will be fully underway in 2013. CBEC is a 225,000 square foot facility that will create laboratory space with the proper floor-to-floor height, structural dimensions, and environmental stability to support intensive research. The building also will adopt the sustainable design practices by Labs 21 in addition to a LEED Silver minimum. Integration of lab controls (Phoenix Controls) is a key component of this project.

Also underway at OSU is the installation of enteliWEB, Delta Controls Enterprise Energy Management Software. The benefits of this native BACnet application combine the power of enterprise dashboards with easy-to-use facility management tools. Customizable Energy Management dashboards and powerful energy reports give OSU the tools to reduce consumption and lower costs. A task-driven alarm management and system dashboard allows OSU to quickly visualize and prioritize their work, keeping the campus running comfortably and efficiently.

Number of Buildings	65
Special Features	One of the Largest BACnet projects in the region with 19 different manufacturers integrated into one single web based graphical user interface.
Products Installed:	The BACnet products include devices from several manufacturers, namely: ABB, Air Cuity, Amann, Automated Logic, Carrier, Critical Room Control, Delta Controls, Field Server, Johnson Controls, Liebert, Lithonia, McQuay, Phoenix, Reliable, Siemens, Sierra Monitor, Trane, Tridium, and York.
Equipment Installed	The integrated equipment includes: HVAC systems, Fire Alarm Systems, Electric Distribution Systems, VFDs, Lighting Systems, Laboratory Systems, Generator / Emergency Power Systems, UPS Systems, Data CRAC Systems, Smoke Evacuation Systems, Isolation Room Monitoring Systems, Air Quality Systems, Gas Detection Systems and Proprietary Control Systems.
Systems Integrated	Boiler, Chiller, CO2 Monitoring, Fume Hood, Geothermal, Heatpump, HVAC, Laboratory, Lighting, Power Monitoring, Smoke, VAV, Water Monitoring
Number of Devices	5,000
System Points	150,000
System Integrator	Building Control Integrators, BCI
Mechanical Contractor	Various Mechanical Contractors
Controls Contractor	Various, Primarily BCI and Siemens
BACnet Manufacturers	Delta Controls, Siemens, Phoenix Controls

Dell Children's Medical Center of Central Texas

Dell Children's Medical Center of Central Texas is the largest children's hospital in central Texas, with 480,000 square feet of space dedicated to the healing of children. The 32-acre campus opened in June 2007 as part of the Seton Family of Hospitals, and includes children-focused facilities such as a healing garden, therapy pool, surgical operating rooms, diagnostic facilities, emergency treatment center, and outpatient rehabilitation facilities.

High Performance Facility

For the client, a high performance facility including state of the art energy efficiency was critical. Achieving LEED® certification was also an important goal for the hospital. In fact, Dell Children's Medical Center is the first health care facility to achieve LEED® platinum certification, the highest level of LEED building certification available.

Solutions

Using the APOGEE® building automation system from Siemens, numerous third party devices were seamlessly integrated using a combination of BACnet, and Modbus protocols depending on the system – including the hospital emergency power transfer switches, domestic water booster pumps and hot water generators, underfloor air distribution system, computer room air conditioners, and therapy pool air conditioning unit.

The APOGEE system integration provides the information necessary to properly monitor the equipment and make complex decisions driving energy savings and efficiencies. Integration to the ABB Variable Frequency Drives in combination with the York underfloor systems using BACnet provides the system control necessary to drive energy costs down based on demand control strategies.

Specific examples of energy efficiencies include the underfloor air units where the system monitors actual temperature vs. temperature set-point, and compares to slab temperature and under floor humidity, and then modulates supply air temperature based on inputs from total readings. Zone dampers modulate small amounts of air flow into the zone, based on demand and required comfort conditions.

The APOGEE system is configured to alarm in the event that any equipment or conditions go out of tolerance, such as critical air handler unit fans, switchgear, or operating/isolation room conditions. Siemens' remote paging and notification software allows the operators to receive alarms and monitoring points via cell phones and pagers.

The building automation system automatically trends utility data regularly. Knowing historical data, facility managers can use the information to track costs and troubleshoot equipment operating out-of-normal ranges, such as power spikes during a given period.

Client Results

The hospital can operate more than 480,000 thousand square feet from a single workstation platform to monitor and control utility data, air conditioning and heating system, and utility distribution plant. This allows the owner to limit maintenance staff, thus reducing ongoing operational costs. A great example includes under-floor air distribution in non-clinical, non-patient areas that requires substantially less fan power than above-ceiling ducts.

Reporting and trending also provides the necessary documentation for compliance and accreditation issues. For example, the hospital can provide historical data on isolation room pressures and operating room temperature and humidity readings as mandated by JCAHO.

The end result is that the facility has efficiency measures that save enough power to fuel about 1800 homes in Austin.

HVACL: Using BACnet to Officially Invite Lighting into the Energy Management System

A unified BACnet lighting strategy, HVACL (Heating, Ventilation, Air Conditioning, and Lighting), will increase the efficiency and reliability of your building.

Independent studies have revealed that around ninety percent of all facilities with a Building Automation System (BAS) have a lighting control system that is completely separate. In addition, even though lighting represents roughly 1/3 of the energy usage of a commercial building (according to the U.S. Department of Energy), when it comes time for an upgrade or retrofit of the lighting control system, the first reaction is to go back to the same sources that provide stand alone systems. It is time to reconsider this behavior.

As a controls professional that has performed numerous site walks in different cities throughout the US, I continue to encounter the same inefficiencies around lighting controls again and again. In contrast, the building automation system is up to date, with the BAS tech there monthly, if not weekly or daily, to keep the building in tune. Then, over in the corner is an old desktop computer that is running the lighting control system. Sometimes, no one has been able to log into it for years, and in many cases, the relays are by-passed to the ensure lights are on 24/7. The unfortunate fact is that people only tend to complain when lights are off, not on, which is not the point of energy management; that's complaint management.

Important Questions to Ask

I think that we have arrived at a fork in the proverbial Energy Management System (EMS) road, and there are important questions that we need to ask ourselves.

- Should we continue to maintain two front ends, two networks, and two separate software platforms?
- If we decide to have a single EMS, do we let the lighting control system take the lead, or do we utilize the existing capabilities of the BAS front end?
- Will we continue to allow lighting control systems that utilize proprietary technology that lock building owners into a single lighting vendor, or should we demand a native BACnet system that empowers multiple vendor and service options?
- Finally, do we want to create and maintain duplicate schedules for HVAC and Lighting, or do we prefer an integrated system that takes advantage of the synergies that can be unlocked by sharing data and unifying the zoning of the entire building?

What is the Problem?

The answers to these questions are obvious to some, but unfortunately, many facility managers have tried and failed to achieve unified HVACL systems. Some will argue that HVACL is too expensive, or complicated, but many of these issues could be easily resolved if we change the way the system is being specified. Creating a BACnet, performance-based specification, with sequences of operation that call for the BAS controls vendor to provide the lighting control equipment, and the electrician to install it, eliminates integration uncertainty, and empowers your BAS provider to select the system that works the best and most reliably with the building control system. It eliminates the finger pointing that arises when there are issues between two separate systems that are integrated using a gateway, and it removes the integration uncertainty premium that the building owner pays when two systems have never worked together before. In this scenario, the electrical contractor still installs the equipment the same way they have always done; only now, after a point-to-point checkout, they have zero risk of being called back to the job to resolve integration issues. From that point on, the building owner and facility manager have a single source dedicated to making the entire facility work as intended, and a single point of accountability.

Utilizing BACnet to Drive Integration

BACnet provides the standards necessary to drive the performance of your building forward. By concentrating on sequences of operations and BACnet PIC (Protocol Implementation Conformance) statements, instead of flashy bells and whistles, you will secure a unified HVACL system that is fully capable of sharing data throughout your building. Now occupancy data can be used for lighting and HVAC, without requiring duplicate sensors, and override switches can be combined where applicable as well. Integrated fire and security systems can now also leverage the lighting, and remote connectivity to your EMS system will allow you to monitor and modify your HVAC and lighting at the same time. In addition, requiring that your lighting control system support local BACnet scheduling means that communication issues will not negatively affect the lights, and trending capabilities ensure there will be no gaps in your data (features especially important in critical operating environments). Finally, card access systems can also interoperate with the lights, providing you with a ton of potential to automate, track, and maximize the efficiency of your equipment.

The Road Ahead

The possibilities are endless, but you may be wondering what the next step is? For starters, I'd suggest talking with your BAS vendor to see what options they offer. You might be surprised to learn that they can furnish a broad range of lighting controls options that reside on the BACnet network, and in many cases, the front end that you are already using is capable of controlling and scheduling lighting in the exact same manner that you are controlling your HVAC equipment. Eliminating duplicate networks, front ends, software, and training, will lower both the initial install costs and the life cycle costs of the systems, and provide you with the interoperability that you want. Then, it is just a matter of determining what sequences of operations you desire, and then working with your partners to create a specification that focuses on performance, and not product features that may or may not even pertain to your application.

Dennis Swoboda
District Manager for Blue Ridge Technologies
BACnet International
Marketing Committee Member

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A Passion for Information

A stellar example of facility management in a critical operations environment.

Bert Gumeringer
Director of
Facilities Operations
and Security Services,
Texas Children's Hospital

Bert Gumeringer is a passionate man. As Director of Facilities Operations and Security Services at Texas Children's Hospital (www.texaschildrens.org), you might think he's passionate about buildings and their operation. And he is. But spend just a few minutes with him and you'll discover that he's really passionate about information. "Managing information is now the key activity for facilities management," Bert says. "Getting arms around information and using it to make business decisions – that's where facility professionals can shine."

Bert should know. He's been involved in facilities management and engineering within the healthcare sector for the last 24 years. During this time, he's been responsible for every support service a healthcare facility might have and has been responsible for increasingly larger facilities. Today, Bert manages 5.2 million square feet in two distinct campuses. His departmental responsibilities include Engineering, Environmental Services, Patient Transport, Security, and Valet Parking. "For some reason, I'm always the guy that takes the homeless departments," he says with a grin.

That's a total of 700 employees reporting to him from the total of 8300 employees in the Texas Children's workforce.

But the way Bert manages today is vastly different than the way he did so earlier in his career. While his focus was on technical management then, he now focuses much more on strategic matters.

"Good and accurate information is extremely important," adds Bert. "In times past that meant that a great deal of effort went into gathering the information and making and responding to requests for it such as via phone calls. We used to be inundated by calls."

"More recently," Bert continues, "we created a tool to capture data from various systems and to keep all involved parties informed. We refer to this tool as Facility Tracker and it represents our way of staying informed, being proactive, and delivering the data that helps us operate most efficiently."

Bert and his staff use Facility Tracker to keep track of construction and pre-construction activities, environmental services activities, engineering projects, regulatory matters – even VIPs

on site. This dashboard is also made available to the senior management of Texas Children's. Both the Senior Vice President of Facilities and the Chief Operating Officer have the tool installed on their PCs.

"It wasn't really hard creating the tool," Bert explains. "The real work was in building the discipline to feed the information into the system."

This approach has worked so well that they now look to it as a singular source or the place to go. They are even beginning to push the data out to the nursing staff so that they can make appropriate decisions regarding patient care. And before any of Bert's people attend a patient safety briefing, they're checking the system for relevant data.

"Now I'm getting asked when the associated mobile app will be ready," Bert says with a broad smile.

In practice, Bert's passion for information and commitment in using it has led to significant results.

Consider valet parking. For years, Texas Children's had a typical approach in place. That meant visitors handing keys to guys in blue shirts and them driving off and parking cars. But the service resulted in many claims of damage such as scratches on vehicles as well as complaints regarding missing items left in vehicles.

Bert and his team examined some potential solutions including one utilized by a casino they visited. As a result, they implemented an automated valet parking management system. It ties the license plate of the vehicle and photographs of the vehicle from four different angles, to time- and date-stamped swipes of the valet ID badge at a security gate. In essence, the system identifies the valet driver for each vehicle. Since its inception, incidents of missing items and claims for damage have gone to "near zero."

"There is no national clearinghouse for such solutions, whether it be for valet parking or building automation," Bert explains. "So I am always on a quest – a quest to find solutions to improve our business."

On his quest, Bert seeks technology-centric solutions. He has, for example, outfitted all of his field technicians with tablet PCs. This has led to improved productivity in a number of ways. For instance, they now find all needed O&M manuals right at their fingertips instead of wasting the time to try to find paper copies located in some mechanical room far across campus.

As another example of this technology-centric approach to business information, consider facility permitting. Bert and his team are "pretty aggressive" about permitting activities, from infection control permits to pre-construction risk assessments. All contractors have been moved to an automated system and it employs multi-function department sign-offs.

Contractor reception? "They have embraced it," Bert states proudly. "Previously," he continues, "they had great difficulty getting to the right individual. There were narrow windows of time to see them and then sickness or vacations brought things to a standstill. Now, a contractor can use the system to make a request from home at any time of day. And, they can use the system to track the status. This convenience and visibility improve their business as well as ours. And, with multiple approvers, nothing gets delayed."

Even the data-rich building automation systems are not left untouched by Bert's quest for better use of information.

"All building automation systems, whether BACnet or proprietary, produce great data," Bert says. "But it's up to us as leaders to use it."

To his automation systems Bert has added Measurement & Verification. "We produce and get an M&V report each morning," Bert says. "It provides a snapshot of building system performance including key factors such as the status of chilled water and steam. Knowing where we are in terms of key parameters like these can help us head off situations that can cost us a lot of money."

Bert does certainly feel the professional responsibility to manage his corporate financial resources appropriately. As a key influencer in the facilities management arena, he speaks regularly to FM professionals such as at conferences. What does he tell them?

"There is a good deal of uncertainty in our industry, especially in regards to implications of the Affordable Care Act," says Bert. "It's not well known or understood what the impact will be. But we might anticipate many financial challenges and a tremendous shakeout of healthcare providers including what could be extensive consolidation. So, I tell my colleagues to manage their work as if it was their own business."

By The Numbers	
2	Campuses
3	Product Lines (Pediatrics, Maternity, Research)
4	Escalators
17	Emergency generators in 6 locations
83	Elevators
305	Air Handlers
658	Beds
700	Employees reporting to Bert
8300	Employees
100,000	Work Orders per year
150,000	Cars valet parked per year
5,200.000	Square feet

He continues: "The business of facility directors is viewed as a cost center but we can have a great deal of influence on the profitability of our hospitals. I can, for example, save one to two million dollars a year by properly managing energy."

By the same token Bert employs many practices of sustainable design and construction. But he does not necessarily pursue LEED certification. "Our research facility is LEED certified because the researchers felt a social responsibility to pursue it," he says. "Elsewhere, we pursue efficient designs and energy saving practices but not the paperwork associated with LEED certification. To us it's a matter of spending the money there or investing in clinical equipment with ROI."

The ranking of Texas Children's Hospital as among the top such facilities in the nation as well as other important recognition, suggests that the work of Bert and his team is reaping dividends.

And so, Bert Gumeringer operates in a world of information management, financial management, and technology management (in that order of importance). He and his respective teams do so with excellence, ensuring the continued viability of Texas Children's Hospital so that the greater purposes of patient care can be accomplished.

Ben H. Dorsey III
VP Marketing & Communications, KMC Controls, Inc.

The Convergence of BACnet and Critical Environments

Prior to the worldwide adoption of the BACnet protocol, communications between critical environments and building automation systems was often challenging and complex. In some scenarios, this required the use of legacy proprietary network protocols which ultimately locked customers into a single vendor, resulting in significant expenses from both a service and support stance.

Critical environments, such as those represented by government, university, pharmaceutical, and healthcare facilities, have traditionally required higher levels of precise control. In the past, that led to certain risks associated with integrating various systems. The result was often fragmented systems, requiring individual management. Fast-forward to today's world where BACnet is everywhere and you will find the products that control critical environments using BACnet. Whether it's BACnet/IP, BACnet MS/TP, or another layer – devices offering control of room pressure, fume hood, and total laboratory control can be found in today's market. Products range from simple devices enabling BACnet communications, to high-end appliances offering touch-screen display capabilities. The information from a critical environment that can be shared via BACnet is no different than your typical equipment for BAS. To understand the basics of critical environment control, an example can be given relative to the use of fume hoods within a laboratory environment.

A fume hood is a common ventilation device used in labs and is designed to limit exposure to hazardous fumes, vapors or dusts. Ranging in various sizes, these fume hoods are intended to protect users, experiments, and environments and, generally, require a localized controller to accurately control air flow and exhaust. Throughout the industry, manufacturers have developed precise means and methods of assuring tight control for these environments – some may measure the actual face velocity within the fume hood whereas others

Ed Parham
Director of Technical Services
With over a decade of active experience in the building automation and controls industry, Ed is responsible for overseeing AAM's Technical Services group, which encompasses technical support services, product testing, and technical documentation. Ed's knowledge and experience with the BACnet protocol permits his involvement in BACnet International's Working Group, which is committed to improving and updating the test standard requirements for products to earn the BTL listing. Ed holds a Bachelor of Science from the University of Pittsburgh.

may use a precision calibrated venturi valve with or without a sash position sensor to maintain constant control. Each control method, while different in their own respects, helps a fume hood device achieve the goals for which it was intended.

With BACnet, all of the discrete items and parameters of fume hood control can be shared and interacted with. Items such as measured face velocity, sash position, exhaust flow, hood presence, damper position, and even closed loop tuning parameters are items that can be exchanged over BACnet. Alarm and Event Notifications such as emergency overrides, hood occupancy, and even start-up and shut-down can be transmitted to a centralized operator workstation depending on the system architecture developed for the building automation system. Like any other piece of equipment in a BAS, fume hoods can be monitored for energy usage and efficiency to maintain not only safety, but also efficiency. General laboratory control is also achievable with BACnet. Generalized needs such as controlling supply air, exhaust air, isolation room pressure, and flow totalizing can be integrated into a BACnet network to ensure safe operation.

SSPC 135 – Fall Meeting Summary

An update on the continued evolution of the BACnet standard.

The BACnet Committee meets 4 times per year: at the ASHRAE summer and winter meetings, plus an interim meeting in the spring and one in the fall. As usual, this year's fall meeting was held at the Georgia Tech Campus in Atlanta.

A special session was scheduled for the first day of meetings so that the whole group could get together to discuss a possible new path forward for BACnet. Dave Robin presented the concept where the new web services work of the XML Working Group (XML-WG) would be combined with the networking re-work being developed by the IT Working Group. This session drew a lot of interest and set the stage for shake ups in a number of the working group meetings over the rest of the week. The discussion centered around the use of web technologies for communication and data modeling at the higher levels of the Building Automation System architecture.

Following the special session, the XML Working Group met and continued discussing the new concept and how it would impact the work of the XML-WG. The working group had developed an addendum to extend the existing web services providing many new services and the ability to model more complex data. The addendum completed an Advisory Public Review in the spring but is now on hold pending the committee's decision on general direction. The working group refocused on CSML and the myriad of ways in which it can be applied in BACnet systems. Expect to see an addendum next year which standardizes the use of the Profile_Name property in conjunction with machine readable CSML object descriptions. The XML-WG was given the responsibility of overseeing all data modeling activities and was renamed the Data Modeling Working Group (DM-WG) to better reflect its new purpose.

In previous meetings, the Application Working Group (AP-WG) had been developing application interfaces in addition to an approach for modeling the application interfaces in BACnet. The framework developed by the group went through an Advisory Public Review earlier in the year. Having passed the framework development task to the DM-WG, the AP-WG is now focused solely on the development of application interfaces. In order for application interfaces to be useful, the committee needs to develop a collection of them. The AP-WG is reaching out to experts outside the BACnet Committee and in early December sent out a Call for Participation for two Rapid Development Groups: one to develop an Air Terminal Unit application interface and another to complete the ongoing work on the Variable Frequency Drive application interface.

The Smart Grid Working Group (SG-WG) continued their discussions on the ASHRAE SPC 201P data model. The SPC 201P data model includes a complex Energy Manager model and the working group is examining how best to bring the Energy Manager into BACnet.

The Information Technologies Working Group (IT-WG) continues to develop a plan for moving BACnet forward replacing BACnet's network and transport layers with IP. The IT-WG also adopted the web services work from the (DM-WG) and will be considering how to merge that work with the current goals during future meetings.

In addition to the work of updating and maintaining the BACnet standard, the working groups have taken up the call from the BTL-WG for help in the development of tests. In recent years, the BTL-WG has been developing the vast majority of the content of ASHRAE Standard 135.1 Method of Test for Conformance to BACnet. The problem is that updates to the BACnet standard have been occurring at a faster rate than that at which the BTL-WG is capable of developing tests. Having the working groups develop tests for much of the new BACnet functionality should help the BTL-WG address a number of the other work items on their plate. Moving forward, the two groups plan on sharing the test development workload.

Dave Robin, the past chair of the BACnet Committee, has been working hard to prepare for a new publication of the BACnet standard. Addendum 135-2010af modified a large portion of the existing standard making it difficult to generate a picture of the current state of BACnet. The new published version should be available early in 2013 and it will include all currently published addenda. While the new publication of 135 will not be available in time for the winter ASHRAE meeting, it should be available soon after.

Carl Nielson
Project Manager, Delta Controls
Chairman, SSPC 135

Simplifying Modbus to BACnet/IP Integration

BASgatewayLX simplified setup procedure:

Step 1: Select your Modbus baud rate and parity.

Step 2: Select the Modbus device profile from the list of profiles and desired registers/coils (or just accept the default settings).

Step 3: Done.

Modbus device profiles can also be downloaded from our site and uploaded to the unit. Also each Modbus device appears as a separate BACnet/IP device. This can help copy/paste devices at the head-end to save you additional time.

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2012 was Another Great Year for BTL Listed Products

More than 300 products have now obtained the BTL Listing. We look forward to breaking through more century milestones in years to come! This year through testing, the following vendors' devices have earned the right to display the BTL Mark.

The BTL Listing is a testimonial that the product was subjected to rigorous verification by testing, demonstrating that it correctly implements interoperable BACnet. That requirement is steadily becoming the benchmark stated in project specifications, to avoid sub-standard implementations. The BTL Mark is permitted to be displayed on devices which have passed BTL Testing.

Testing ensures that a device correctly implements all of the BACnet functionality that it contains. ASHRAE standard 135.1–2011 and the BTL Test Plan governs the testing. There are three documents required to be filled out and mailed/emailed to <btl-manager@BACnetinternational.org> in order to make application for testing and commence the testing process. Fillable forms and instructions describing the entire testing process are in the 12.0 test package, at www.BACnetinternational.org/ associations/8066/files/BTL_ Test_Package_12.0.final.zip The BTL Checklist and BTL Testing Application determine the testing which will be performed. Every device is different, but a schedule estimate and testcase can be created from those two documents. A signed BTL Testing Agrmt and US $ 1,000 deposit secures a place in the test queue. BACnet International member companies at Silver level or higher receive a discount on testing fees. It is common for testing and a Listing to apply to a family of devices that share underlying BACnet software. We test only the BACnet functionality. If the same firmware is used in common amongst devices, one testing and one Listing can apply to the family. If you have any further questions please do not hesitate to ask. I look forward to seeing your application for BTL testing.

Airtek International
- Operator Display Panel

Alerton
- BCM-ETH

American Auto-Matrix
- Building Controller

Beckhoff
- TwinCAT BACnet/IP

Control Solutions, Inc.
- Babel Buster

Delta Controls
- ORCAview

Distech Controls, Inc.
- EC-Net Supervisor (with BACnet AWS Driver)
- EC-Net Supervisor (with BACnet OWS Driver)

Douglas
- WBI-2671

Honeywell
- ComfortPoint Open Plant Controller
- DR-NS-BAC-AWS

iControls
- IDC702

ICONICS
- GENESIS64

Johnson Controls
- Facility Explorer
- Field Advanced Controller
- Field Equipment Controller

Kamstrup
- MULTICAL 62,601,602,801

KMC Controls
- Flexstat
- TotalControl

LG Electronics
- LG Building Management
- LG DDC

LOYTEC
- L-INX/L-GATE family

Lutron
- Quantum Process

Nara Controls
- MEGA Series BACnet Advanced Workstation
- MEGA Series BACnet Controller

Neptronic
- SM actuator with BACnet

Price
- PIC, PIC-FC, PIC-HP, PIC-DD, PIC-SET, PIC-LF

Priva
- Top Integration

Reliable
- RC-AR3-300
- RC-Studio 2.0
- MACH-ProZone/ProAir
- MPWC, MPWS, MPC, MPS

Rockwell Automation
- BACnet IP Comm Adapter

Samsung Techwin
- Network Gateway Controller
- Programmable Controller
- VAV Controller

Sauter
- EY-modulo 5 Room Automation Controller
- EY-modulo 5 Building Controller

Schneider Electric
- METSEEM480516
- StruxureWare

Siemens
- Apogee BACnet Compact Controllers
- Desigo CC
- PXC Compact for BACnet IP Networks
- PXC Compact for MS/TP Networks
- SINAMICS G120P Control Unit
- TC Compact Unitary Equipment Controller
- TC Compact for BACnet IP and MS/TP Networks
- TC Modular/Compact for BACnet IP and MS/TP Networks

Telaire
- Ventostat T8000 Series

Trane
- Tracer UC600 Progammable Controller
- Tracer System Controller

Trend
- IQeco 31,35,38,39 VAV P,VAV PA
- Trend Open Network Node
- TR-TOUCHVIEW

Triacta
- 4000/6000

Tridium
- JACE-2 and JACE-6

Yaskawa
- VFD Bypass

Attendee Perspective: Report from PlugFest 2012

PlugFest: Workshops enabling various manufacturers to test their products with others to ensure open and interoperable communications.

BACnet International PlugFest 2012

Where the pieces come together

Our Participation

This was our second participation at the annual PlugFest and once again this proved to be an excellent and rewarding experience. Interoperability has become a very important trend and more and more manufacturers are seeing its benefits. During the BACnet International PlugFest 2012 we registered a team of 3 people and tried to maximize the opportunity that the BACnet International Plugfest provides of validating our products with several other manufactures' products from diverse industries.

Our Goals

- Confirm reliability of the "Auto Baud Rate Detection" feature
- Measure the impact of the "Multiple Read Property"
- Validate our "software vs. hardware" response speed
- Verify our system feedback (error codes, complies with set limits, etc.)
- Evaluate ease of use of our parameters
- Document comments received on our products and our use of BACnet
- Connect to products using the BACnet communication protocol from multiple manufacturers in diverse industries

Environment

Part of what makes the PlugFest valuable is the gathering of professionals with a common goal. Competition is put aside and instead there is camaraderie and an environment that promotes the exchange of ideas, sharing of technical prowess and mutual improvement of the products and their use of the BACnet protocol. We were pleasantly surprised to have received several positive comments on our products and their excellent implementation of the BACnet communication protocol.

The one-on-one test sessions combined with the round table formats enabled us to connect with products from over 10 manufactures from different industries with over 10 hours of intense testing and operation. This level of testing, diversity and access to information would be extremely difficult to obtain without this sort of event. This event gave us the opportunity to test over 50 commands and scenarios with three of our products including one brand new product.

Results

- Our controls respond to commands very quickly.
- We make good use of the "out of service", which simplifies testing.
- Our "Auto Baud Rate Detection" feature is very effective.
- Our communication is solid and rarely fails.
- We need to make some very minor changes to comply with version 12
- Our peers were impressed with the speed, reliability and effective use of our BACnet communication.

Conclusion

The value of the product validation, sharing and learning that occurs in such a short time is definitely worth the investment of attending next year. Even some mutual business opportunities arose from these great encounters. We're planning to send two teams next year in order to maximize our benefits from this event.

Luis I. Melgares
Regional Sales Manager
Neptronic

Leaders of the Pack Awards

"Within the BACnet International community, there are members who go above and beyond to make BACnet an effective and successful building automation standard. This is the time when we award those individuals as "Leaders of the Pack" and recognize them for enriching this organization in every way they know how. Please join me in thanking the winners again for their unfailing loyalty to BACnet International and the BACnet standard."

Andy McMillan,
President of BACnet International and Phillips Teletrol.

Join BACnet International in recognizing the outstanding achievements of individuals and companies in the BACnet International community. These awards are intended to allow BACnet International members the chance to recognize and celebrate the hard work, commitment and accomplishments of its members.

Award	Winner	Comment
Bulldog Award	Carl Neilson of Delta Controls	The Bulldog Award serves to recognize an individual for always coming to the rescue and for unquestioning loyalty to BACnet International and the BACnet standard. This year, he worked tirelessly to bridge the gap between certification handbook efforts and BTL lab recognition.
Doberman Pinscher Award	Thomas Kurowski of WSPLab	The Doberman Pinscher Award goes to an individual who keeps the group in line and upholds the BACnet standard. This year's winner works for WSPLab to ensure the testing process is accurate and complete.
Howler Award	Reliable Controls	The Howler Award serves to recognize a company for making a lot of noise about BACnet International and BACnet Standards. For several years, Reliable Controls has maintained a steady investment in advertising, event participation and active involvement within the BACnet community. In doing so, they always promoting BACnet as well as their own solutions. This is especially noteworthy as a privately held company.
Fox Hound Award	The S4 Group, Inc.	The Fox Hound Award goes to a company who quickly and stealthily came up from behind in BACnet International. In their first year of membership, the S4 Group, Inc. migrated over 10,000 N2 devices to open BACnet interfaces.
Best in Show Award	WPPI Energy Office & Operations Facility	The Best in Show Award goes to a project posted in the BACnet Success Stories. This BACnet Success Story has every hallmark of a showcase project: it is a well composed, compelling narrative. It clearly identifies the customer's needs and how BACnet was used to address them. It is a multi-vendor BACnet project, has compelling photos, all firms were identified and as a bonus, it is a LEED gold facility. In short, this is BACnet Success Story is a benchmark for excellence.
Alpha Dog Award	Brad Hill of Honeywell International	The Alpha Dog Award is awarded internally to an individual who exhibits outstanding leadership within BACnet International. This person is a constant and dynamic voice of BACnet International through his leadership. It is awarded to Brad Hill of Honeywell International in recognition of his stepping up to lead the BACnet International test lab recognition initiative, which is a critical part of maintaining global consistency and collaboration in BACnet testing policies and execution.

New to the BACnet International Family

BACnet International is the international organization that encourages the successful application of BACnet through interoperability testing, educational programs and promotional activities. BACnet International complements the work of other BACnet-related groups whose charters limit their commercial activities.

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

We are pleased to congratulate Xylem for upgrading their membership level to Gold.

We are also proud to have welcomed the following new members to our ranks in 2012:

acutherm™
Therma-Fuser™ Systems

Acutherm

Acutherm manufactures components for heating and air conditioning systems that make commercial buildings more comfortable, save energy, offer sustainability and can also reduce total installed costs. Our components are called Therma-FuserTM variable air volume (VAV) diffusers. They are used in VAV air conditioning systems which, instead of varying the temperature of the cooling air, vary the amount of the cooling air to maintain even room temperatures.

Acutherm
United States
Silver Member of BACnet International
www.acutherm.com

DOUGLAS
LIGHTING CONTROLS

Douglas Lighting Controls

Douglas Lighting Controls has manufactured and supplied lighting control equipment since 1962. Over the past nearly 50 years, Douglas has developed many lighting control firsts. Today, Douglas Lighting Controls Inc. continues to engineer, manufacture and distribute, lighting control products for the North American and International markets. We manufacture a full line of lighting control products from basic components to pre-assembled systems. Our products and systems are installed in thousands of buildings worldwide and we have come to be known for our reliable product and years of tremendous service.

Douglas Lighting Controls
Canada
Silver Member of BACnet International
www.douglaslightingcontrol.com

ChillCo
Comprehensive Cooling Solutions
Excellence through Employee Ownership

ChillCo, Inc.

ChillCo, Inc. is one of the largest independent companies in the nation focused on large tonnage chiller plants, utilized in commercial and industrial facilities. By providing comprehensive cooling solutions to owners with chilled water equipment, we help our customers prevent and solve both routine and catastrophic cooling system problems. Our approach to business is multi-faceted and comprehensive.

ChillCo, Inc.
United States
Integrator Member of BACnet International
www.chillcoinc.com

General Electric – Advanced Sensors

GE Measurement & Control Solutions is a leading innovator in sensor-based measurement, inspection, asset condition monitoring, controls, and radiation measurement solutions that deliver accuracy, productivity and safety to customers in a wide range of industries, including oil & gas, power generation, aerospace, transportation and healthcare. The business is part of GE Energy Services and has more than 40 facilities in 25 countries worldwide.

General Electric – Advanced Sensors
United States
Silver Member of BACnet International
www.ge-mcs.com

Indusoft, Inc. – Silver

Founded in 1997, InduSoft offers a powerful HMI SCADA software for developing Windows®-based applications in industrial automation, instrumentation and embedded systems.

Today, InduSoft's strategy is to empower people and companies to develop graphical interfaces, integrate web browsers, and take advantage of Internet connectivity.

InduSoft provides leading-edge SCADA software technology that uses the Internet to access data that is stored on industrial devices and test and measurement equipment. In addition, InduSoft tools and technologies convert personal computers, web browsers, and such remote productivity devices such as cell phones, pagers, and personal digital assistants (PDAs) into industrial automation and test and measurement systems.

Indusoft, Inc. – Silver
United States
Silver Member of BACnet International
www.indusoft.com

Leviton

Leviton is the smart choice, providing the most comprehensive range of solutions to meet the needs of today's residential, commercial and industrial buildings. Leveraging more than a century of experience, Leviton helps customers create sustainable, intelligent environments through its electrical wiring devices, network and data center connectivity solutions, and lighting energy management systems. From switches and receptacles, to daylight harvesting controls, networking systems, and equipment for charging electric vehicles, Leviton solutions help customers achieve savings in energy, time and cost, all while enhancing safety.

Leviton
United States
Silver Member of BACnet International
www.leviton.com

Price Electronics

Price offers a top-quality level of service which is unparalleled in the industry. We provide effective and knowledgeable customer service representatives as well as application engineering support to help our customers in dealing with their unique requirements.

We are committed to helping our customers succeed in meeting all of their objectives. Digital marketing aids and software tools, which complement our talented customer service force, make it easy to do business with Price.
"Our Mission is to Become the Worldwide Supplier of Preference for Air Distribution Products and Services".

Price Electronics
Canada
Silver Member of BACnet International
www.price-hvac.com

SangMyung University

South Korea
Silver Member of BACnet International
www.naodigital.com

Spark Controles Ltda.

Spark Controls was established in 2001. At the beginning, our activities focused on the integration of building automation systems and electronic security. Since then we have sought to build smart environments that provide comfort, safety and economy to users.

We provide complete systems for automation and control of power systems, air-conditioned comfort and processes, hydraulic and transport. Our controllers meet national and international standards of quality using various protocols. Properly implemented and integrated the situations required.

Spark Controles Ltda.
Brazil
Integrator Member of BACnet International
www.sparkcontroles.com.br

Strato Automation

For nearly ten years now, Strato and CIMEQ (Centre d'innovation en microélectronique du Québec) have been working in close collaboration developing a new generation of building automation system, the purpose was to offer an automation system that would be entirely developed and built in Quebec.
Our mission is to To offer our clients and end-users the best possible advantages through our products with regards to quality, price and service.

Strato Automation
Canada
Silver Member of BACnet International
www.stratoautomation.com

Editorial Notes

BACnet International Journal **ISSN 2191-7825**

The BACnet International Journal is a global magazine for building automation based on BACnet technology. Experts, practitioners and professionals show the way in applying and developing the BACnet standard – from building automation trends to devices and application projects; from qualification and training to testing and certification; from who's who in the BACnet community to useful information on events and publications. Special attention is given to members and activities of BACnet International.

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This Journal can be ordered free of charge by BACnet users as well as partners, members, media representatives and friends of BACnet International. Order the BACnet International Journal by e-mail at info@BACnetinternational.org

Online distribution
The BACnet International Journal is posted as a Portable Document Format (PDF)-File to www.BACnetinternational.org

Editor
MarDirect Marketing Direct GbR
Droste Hülshoff Straße 1
44141 Dortmund, Germany
Phone: +49 2 31 42 78 67 31
Fax: +49-2 31 42 78 67 32
URL: www.BACnetjournal.org

Board of Directors
Andy McMillan, President, Philips Teletrol
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Publisher
BACnet International
PMB 321
2900 Delk Road, Suite 700
Marietta, GA 30067-5350
Phone: 770-971-6003
Fax: 678-229-2777
info@BACnetinternational.org

Advertising
MarDirect Marketing Direct GbR
Phone: +49-2 31-42 78 67 31
Fax: +49-2 31-42 78 67 32
E-mail: america@mardirect.de

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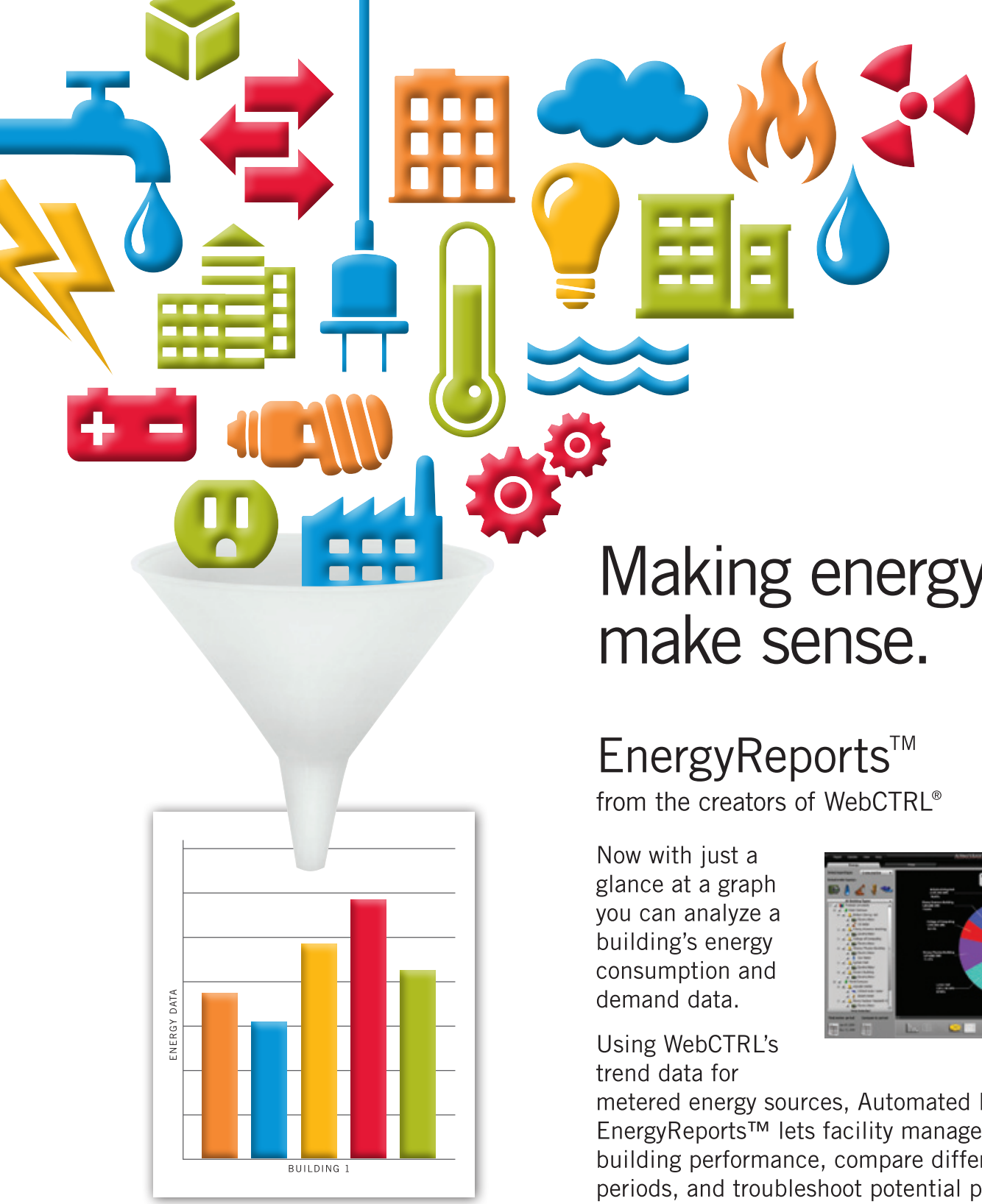
Calendar of BACnet Events

Date	Location	Event	Highlights
2013			
January 18-20, 2013	Dallas, TX	AHR Expo	BACnet International booth (member product showcase display) and education track
March 12-14, 2013	Baltimore, MD	NFMT	BACnet International booth
April 23-25, 2013	Philadelphia, PA	LightFair International	BACnet International booth
September 17-18, 2013	Las Vegas, NV	NFMTVegas	BACnet International booth, education sessions, awards ceremony and reception
November 20-22, 2013	Philadelphia, PA	Greenbuild	BACnet International booth
Fall 2013	TBA	PlugFest	Hosted by BACnet International, includes interoperability testing, roundtable testing, education sessions

Information about all Events:

Sarah Jackson, BACnet International Office, sarah@BACnetinternational.org



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Cornerstones
a monthly eNewsletter which includes information on BACnet Success Stories, the latest products from member companies, educational resources, highlights of global events, and much more

Free Educational Session Presentations
for those who are unable to attend trade shows such as NFMT Vegas (formerly Facility Decisions) and AHR Expo, BACnet International makes all BACnet International education session presentations available for download PDFs to members

Free Downloadable White Papers and Articles
covering diverse topics such as best practices, case studies, products, etc.

BACnet International
trade show events, socials and networking opportunities

Web access to BACnet International publications:

- *The BACnet International Journal:* includes the back story to featured BACnet International Success Stories, insights, product features, and news
- *Foundations:* the newest publication in the BACnet International family is an educational (no ads!) resource with in depth articles geared toward the integrator/installer/applier and specifier/consultant

Free Educational Webinar
access to view annual webinar produced jointly with Building Operating Magazine

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www.bacnetinternational.org
PMB 321 • 2900 Delk Rd, Ste 700 • Marietta, GA 30067
770-971-6003 ph • 678-229-2777 fax • info@bacnetinternational.org

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