



T.E.C. NEWS QUARTERLY



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Enabling Energy Intelligence

KeySpan's New Energy Monitoring & Data Services Application Harnesses LonWorks® Technology to Enable Smart Metering

Energy consumption and energy efficiency are topical matters in today's challenging economy. For most businesses, cost from energy usage represent the vast majority of the total cost of operations, which inherently drive an economic imperative for reducing expenditure, improving profitability and achieving better value. Accountability in energy management is very effective in significantly reducing the outlay attributed to energy and operational anomalies. Achievement of best practice energy management is the culmination



of many activities across all facets of a company's operation, and can be integrated into other management schemes, e.g. quality, safety, environment, or be achieved through a stand-alone energy management system.

Wyckoff Heights Medical Center is a voluntary not-for-profit teaching institution offering comprehensive health services to the people of the City of New York. The hospital has approximately 509,000 square-feet and includes a bed complement of 350. To discover where the hospital could save on energy expenses, they first needed to examine its energy profile-what it costs, how much energy is used, and where it is used. Gathering energy use data, continued on page 3

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We specialize in:

- HVAC SYSTEM CONTROLS
- OPEN/INTEROPERABLE TECHNOLOGY
- SYSTEMS INTEGRATION
- FIRE/SMOKE CONTROLS

What's New?

The Museum of Modern Arts (MoMA) - "Building Project" Continues

The Museum of Modern Art continues an extensive renovation and expansion that will double its previous exhibit space with larger, more flexible sky-light-enhanced galleries for its permanent collections and temporary exhibitions. Part of the new construction includes an extensive education and research complex, an entrance specifically devoted to school groups and tours, and an additional theater. The \$650 million project is expected to be complete later this year. T.E.C. Systems, the controls integrator for the project, continues its installations at the facility, which will feature a centralized controls and comfort system based on Honeywell's Building Automation Systems (BAS) Architecture. Initial phases of the project are complete, and the company is on its way to the latter phases of startup, commissioning and checkout.



The view on MoMA expansion construction site late 2003.

Sustainability and Beyond: Business Leadership Through Innovation and Design

June 14-18, 2004
Charlottesville, VA USA
Contact: Nancy Stahon
Registration Coordinator
Phone: 877.833.3974

BuildingTech Americas

June 16 - 17, 2004
Radisson Deauville Resort
Miami Beach, FL USA
www.buildingtechamericas.com

ASHRAE Annual Meeting

June 26-30, 2004
Nashville, TN USA
<http://www.ashrae.org>

ISA Security Technical Conference

July 12 - 15, 2004
Philadelphia, PA, USA
<http://www.isa.org>

APPA 2004 Educational Facilities Leadership Forum

July 25 - 27, 2004
Marriott Wardman Park
Washington, DC, USA
<http://www.appa.org>

Tenant Fit-Out Controls Contract Awarded For 300 Madison Avenue

T.E.C. Systems Incorporated has been awarded the 300 Madison Avenue Tenant Fit-out Project. Through a contract with the Turner Construction Company, T.E.C. Systems will furnish, install and integrate a Honeywell SymmetrE™ building management system (BMS) into the existing base building system (previously furnished and installed by T.E.C. Systems).

Leading LONMARK Product

ECHELON Corporation
i.LON® 600 LonWorks®
IP Server | Models 72601,
72602, 72603 and 72604



Features and Benefits

- Transforms the Internet (or any 10 or 100 BaseT IP- based LAN or WAN) into a pathway for carrying LONWORKS control information locally, nationally, or around the world
- Provides highest performance Layer 3 routing of LONWORKS control packets
- Supports LONWORKS/IP channels up to 256 devices¹
- Supports multiple units behind NAT firewalls¹
- EIA-852 & ANSI/EIA 709.1 compliant¹
- Security features include MD5 authentication for secure access
- 8T DIN packaging
- 24V AC or DC or 90V-240V AC or DC power input options
- CE Mark, U.L. Listed, cU.L. Listed, TUV Certified

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together with information about hospital operations, would form a baseline of the facility's current energy use, which could then be used to measure the success of future improvements. An existing KeySpan Energy customer, the hospital emerged as a prime candidate to introduce the utility provider's new energy management solution, the Energy Monitoring & Data Services (EMDS) application. A member of the Standard & Poor's 500 Index, KeySpan is the largest distributor of natural gas in the Northeast serving 2.5 million customers. KeySpan is also the largest investor-owned electric generator in New York State and operates the Long Island Power Authority's electric system serving 1.1 million customers.

System Architecture

EMDS is an extrapolation model, incorporating LonWorks® Protocol, which uses data from utility meters to monitor energy use in the industrial, commercial and service sector. The system is developed in such a way that for each holding of the aforementioned population, consumption data is collected and streamlined in real-time over the internet to any location in the world, thereby allowing subscribers to calculate the energy utilization for different aggregates. The technology allows both new and existing installations of KeySpan metering products to be web enabled and connected via the internet or private intranet to proprietary reporting systems-providing corporate administrators and facility managers with cost effective tools to enable the exchange of information between facility management systems and enterprise information management systems. Ideal for recording of utility consumption from pulsing meters, the system has an unlimited memory capacity for consumption data, and is complemented with the flexibility for user defined

recording periods.

Installation

At Wyckoff, KeySpan employed the services of T.E.C. Systems Inc., which, in its capacity as an experienced Building Automation Systems Integrator, would facilitate the means of communicating data from utility meters at the facility to the EMDS application that would optimize such data for dissemination over the internet. To that end, T.E.C. Systems furnished and populated the facility with Echelon's iLON-100 servers: a device that



bridges data from a LonWorks network to the internet for monitoring and control through standard web browsers. Utility meters are retrofitted to provide a pulse output signal representative of the energy being utilized, e.g. 1kWh/pulse for electric, 100 CuFt/pulse for gas. Pulses are monitored and logged by the iLON-100 servers. Data is transmitted on user-defined intervals to the EMDS application via the Simple Object Access Protocol (SOAP (XML protocol)) for long term archiving, aggregation, alarming, and presentation.

Client-Side Access

All information logged can be accessed from any authorized PC on the hospital's existing site network by RJ45 twisted pair connection. An authorized hospital personnel has the ability, through a standard web browser, to access the application and view the collected data. Views include energy usage graphs, and reports. In addition, the iLON also serves as a Hyper Text Transfer Protocol (HTTP) server for system configuration and an HTTP Common Gateway Interface (CGI) Query mechanism to automatically input data into spreadsheet programs such as Microsoft Excel.

The EMDS Advantage

For Wyckoff, implementation of the EMDS application is the commencement of a planned expansion of the hospital's energy management program into an integrated information platform to collect and analyze facility information. This capability will enable staff to diagnose, recommend, and execute timely solutions that help reduce costs, increase system reliability, and improve facility environment. Further more, establishing a tracking and monitoring system for energy use will develop consumption patterns revealing the time-of-use, peak usage and usage efficiency. In addition, Tracking and monitoring will help to confirm savings from existing efficiency investments and identify new opportunities for savings, set up a database for cost control, and benchmarking. This information will be an effective tool for reporting information to administrators, facility managers and major users. For the facility manager, analyzing energy consumption will provide a base to ensure a facility's energy resources are used to their maximum advantage. For administrators, a load profile of the facility is a major advantage in negotiating utility rates. ■

The Environment of Care Demands Optimal Controls & Comfort Systems

The environment of care consists of one basic component: building(s) efficiency. A variety of key elements and issues can contribute in creating the way the space feels and works for patients, families, staff, and others experiencing the health care delivery system. In addition, they can be significant in their ability to positively influence patient outcomes, satisfaction, and improve patient safety.

When appropriately designed into and managed as part of the physical environment, this element creates a safe, welcoming, and comfortable environment that support and maintain patient dignity and personhood, allow ease of interaction, reduce stressors, and encourage family participation in the delivery of care. Effective management of the environment of care includes using processes and technologies to reduce and control environmental hazards and risks, maintain an environment that is sensitive to patient needs for comfort as well as maintain an environment that minimizes unnecessary environmental stresses for patients, staff, and others coming to the facility.

New Harlem Health Center

Sited on a triangular-shaped lot at West 125th Street, Morningside Avenue and Hancock Place in New York City, NY, the new \$30 million Harlem Health Center is already an architectural fixture, embodying the dramatic additions to the historic neighborhood. Developed and owned by the New York City Hotel Trades Council and Hotel Association of New York City (HANYC), the center is demonstrating trends toward community renewal, architectural prowess,



and advanced building controls and comfort systems. Designed by Perkins Eastman Architects, out of New York City, the 110,000-square-foot facility has been developed primarily for the benefit of union members and their families (the HANYC member population totals over 30,000 employees). Clinics include dentistry, obstetrics and gynecology, pediatrics and physical therapy. Rising to 10-stories (includes a cellar and 9th floor penthouse), the center occupies the first five floors and basement, leaving the sixth through eight floors as office space. Designated as a community-use facility, the complex also has 11,000 square-feet of retail space.

Designers "AAM" High To Ensure Efficiency

The angularly shape glass and brick clad structure presented a plethora of challenges to the Perkins Eastman led construction team, concerns that led planners and designers to seek an unconventional outward appearance, but one that use the space efficiently; an impressive achievement echoed par-

ticularly well throughout the facility's mechanical, electrical and plumbing design.

To introduce a truly first rate facility environment at the center, designers and planners specified the standardization of plant operations to the innovative and technologically advanced American Auto-Matrix (AAM) building automation system (BAS) platform. AAM offers "true generation-to-generation compatibility," enhanced cost effectiveness and system reliability. AAM also offers interoperability through the use of traditional open protocol as well as the capability to add industry standard protocols like BACnet®.

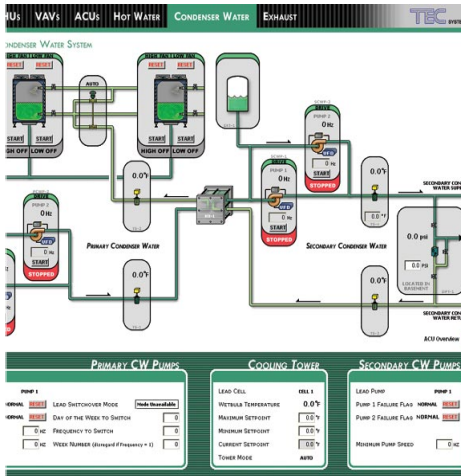
The responsibility of satisfying this mandate rested "on the shoulders" of, T.E.C. Systems, Inc., a full service contractor providing innovative cost-effective control and facility management solutions throughout the New York Metropolitan Area. As an Authorized Solutions Integrator of AAM for nearly a quarter of a century, T.E.C. Systems was able to offer the center state-of-the-art solutions that maximized the facility environment.

At first glance, the company outlined two prime directives:

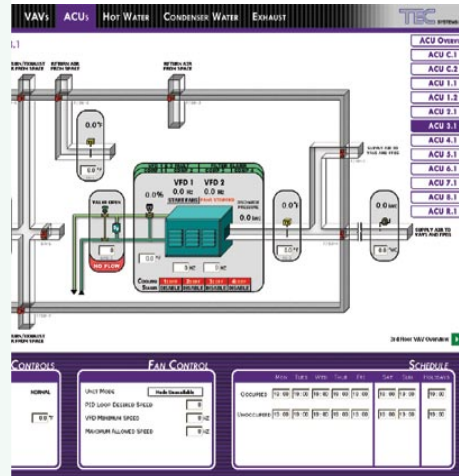
1. Provide a high-quality healing environment for patients at minimum cost; that is to contain facility management and energy consumption costs while maintaining the quality of patient care, comfort and security.
2. Streamline the overall energy performance & management process.

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Views from the Graphical User Interface workstations



Condenser Water System



Air Conditioning Units

Using extensive input from the mechanical, electrical and plumbing engineer, Edwards & Zuck, P.C., out of New York City, T.E.C. Systems finalized a function-driven direct digital control (DDC) design for the building. Engineered for convenience and flexibility the design enabled the customization of the BAS to the specific needs of the center.

Mechanical Plant

The 9th floor plant is approximately 40 feet above the main medical offices. The inherent benefit in this approach is the reduction in the acoustic impact on patient care areas and it simplifies future complex expansion. It also turned out to be a lower-cost method than including the mechanical plant at the base of the building. The mechanical plant was designed to allow installation of additional load capacity as needed by future expansion of the medical facility. The comfort conditioning requirements for the new building were not only rigorous, but also varied for the different use areas; differing temperature and ventilation requirements for operating rooms, meeting areas and patient rooms.

The facility includes a wide range of equipment including hot and con-

denser water systems, air handling units, air conditioning (AC) units as well as smoke purge, gas, and CO2 monitoring systems. The condenser system includes a cooling tower, and primary and secondary chilled water pumps. The hot water system features boilers, hot water pumps, and ventilation combustion dampers. The air handling units operates on 100% outside air, and supports 12 AC units, 59 (VAV) boxes, 60 fan powered VAV boxes, and 10 general exhaust fans. The varying comfort requirements led the engineer to specify individual floor air handlers to better serve the facility.

Controls

To monitor, manage and maintain the HVAC and ancillary comfort systems, T.E.C. Systems implemented AAM's highly adaptable Auto Pilot system, a graphical user interface (GUI) that optimizes the facility management process. Auto Pilot is an automation platform for distributed hardware and provides end-to-end control, graphical view, monitoring, and management of multiple devices across platforms. The system monitors and manages the operational status of building-critical equipment and systems. It offers sophisticated management functions to improve reliability and availability at all layers of

an integrated environment. The complexity of monitoring and remedying various operational conditions and faults makes the management of building systems, especially those using one or more solutions, a critical and specialized task. Auto Pilot is an industry-based, distributed monitoring and control solution that is designed to manage today's open-protocol based building systems. It monitors and logs facts about the operational state of equipment and entire infrastructure. These facts, collected in real time local to the node running the monitored controller, can be access over the entire managed network and selectively correlated to provide a system view.

System Benefits

Benefits of the GUI can be seen to fall into one of two major categories: direct and indirect. The direct benefits represent the efficiency and effectiveness results inherent to the Auto Pilot system, which includes the continuous monitoring of care and comfort parameters for temperature, and humidity; allowing facility personnel to take proactive steps to reduce energy consumption and increase operational efficiencies. Although these benefits are significant, a greater pay-off is expected as an indirect result of the BAS. The indirect benefits include savings related to better use of energy, water, and materials; reduced occupational safety and health costs; fewer compliance obligations; and less waste to treat or dispose.

The theme at the Harlem Health Center is responsiveness to patient needs. The medical center is a reflection on how those needs have changed. The design of the facility reflects the expectation that those changes will continue in the future. As medical needs of patients change, so can the systems that serve them. ■

In The Spotlight Professional Training Courses

Keeping up to date through training is essential in order to compete effectively within increasingly challenging business environments. For individuals, this expertise helps secure a fulfilling career. Ultimately, employees who have the skills and knowledge needed to perform their duties -- and whose accomplishments are recognized -- will out-perform, both in quality and quantity. For companies this results in raising the standards of your services, ensures greater customer satisfaction and helps attract new business. The list below is a tool to help you save time once you decide to invest in Controls training.

American Auto-Matrix	Honeywell	LonWorks
Auto-Flow Auto-Pilot BACnet KeyMaster Lite Access Control Applications KeyMaster Pro Access Control Applications SAGEMAX SAGEMAX / SF1 Selling and Marketing KeyMaster Access Control SPL/BACNET Seminar Unitary Controller	ACSELON - SymmetrE™ Authorized Trainer Program Enterprise Building Integrator Excel 5000 Excel 10 Excel Building Supervisor Excel Building Supervisor - Integrated Fire and Security HVAC Systems and Controls Light Commercial Building Solution	Introduction to the LonWorks Platform LonWorks Device Development Using the LonMaker Integration Tool LNS Network Tools Development LonWorks Network Design Specifying Open Systems Connecting LonWorks to the Internet Integration of the i.LON 100 Server LonWorks Network Troubleshooting Introduction to Panoramix Building a Panoramix Solution Customizing and Integrating the Panoramix Platform



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