Case Study: Quintiles World HQ

The Durham, North Carolina, headquarters for Quintiles Transnational Corporation, the world's largest pharmaceutical services company, oversees clinical, commercial, consulting and capital services in more than 50 countries around the globe. Quintiles Plaza, the brand new nine-story, $51M complex, is 252,000 square feet and home to more than 1,700 employees in the Triangle—the Raleigh, Durham and Chapel Hill region created by the location of multiple high-tech companies and enterprises. Quintiles headquarters and Quintiles Plaza are part of Imperial Center, a 456-acre planned mixed-use development on the southeastern edge of the Research Triangle Park.

The roots of Quintiles were planted at nearby University of North Carolina-Chapel Hill, and when the company decided to build its global headquarters in Durham, it took a "green" approach that illustrated its financial and environmental dedication to community stewardship. For their automated building management system, Quintiles tapped Automated Facility Solutions, Trend's North Carolina technology center.

A Trane chiller integrated into the Quintiles building controls system: The Trend system delivers accurate, real-time building data for precision control of the facility.

Coordinating multiple groups of design engineers and stakeholders to achieve the desired LEED rating was the largest challenge. There were four groups of engineers—design, base-building, mechanical and fit-up—each with a vital piece of the LEED puzzle. Automated Facility Solutions (AFS) would be the linchpin of each stakeholder's role regarding where and how the building controls solution earned LEED points in the Quintiles project.

AFS installed a Trend IQ3 system that monitors heating, ventilating and air conditioning (HVAC) system performance to ensure peak efficiency and, subsequently, generate the maximum possible LEED points. The project includes IQLVAV, IQ3xact and IQ3xcite controllers, air handling units, a central plant, expansion modules, fan-coil units, variable frequency drives, and BACnet® integration to the Liebert data center cooling units. The IQ controllers manage all the building's functions through Trend's 963 Supervisor operator software.

Quintiles Transnational Corporation world headquarters is home to a powerful and flexible Trend-based building system that helped the facility earn LEED-Silver certification.

There is no grace period between the day a system is turned on and the moment energy management begins. So AFS used the Trend system to establish sequences of operation because IQ controllers have the flexibility to modify direct digital control (DDC) sequences based on functionalities required by the different engineers. During commissioning, programmers were able to quickly accommodate tweaks to the system and streamline the process as much as possible. For example, when an issue with staging the chillers cropped up, AFS technicians were able to revise the programming, simulate the revised sequence offline and download the final code—all while engineers were still on-site to see the successful correction.

Working together on the central plant control sequence, AFS and the design engineers were able to optimize the control sequence so that the 1,200-ton chiller plant does not operate until the outdoor air temperature reaches 65 degrees or higher. This significantly reduces Quintiles' utility consumption and cost.

"Most controls vendors have only a canned program for sequences and if you go a notch beyond that, they have very few people able to handle it; so an engineer may not see what a sequence can do until it's written, and even then, the technician may not be able to make a field modification," said

A Quintiles Plaza chiller plant: Trend's 963 Supervisor front-end software gives building staff quick, comprehensive views of the entire system.

Keith Rogers, PE, VP, design engineer for Bass Nixon & Kennedy. "With the Trend system, we can make revisions in just a few minutes and away we go."

Quintiles earned an HVAC LEED point by installing an energy recovery ventilator (ERV) unit instead of dedicated CO_2 monitoring equipment. An ERV brings fresh outside air into the facility, pre-cools it and then exhausts an equal amount of stale air. By tempering the air, the ERV lowers the required chiller tonnage for the building. The unit can also simultaneously recapture most of the heat from the hot and cold airstreams using an air-to-air heat exchanger. This way, Quintiles significantly reduces its energy consumption and spends less money to condition the exchanged air. Not only did Quintiles earn the LEED point it would have earned through CO_2 monitoring, the company also saved $53,000 by going with the less expensive ERV unit.

> *"All of the LEED components have combined to reduce electricity costs a lot more than anticipated."*
>
> *Ken Conoly,*
> *Senior Property Manager*
> *TriProperties, Inc.*

The Trend system provides BACnet integration with eight Liebert data center cooling units, which monitor temperature, humidity and multiple alarm conditions. The BACnet open protocol enabled Quintiles to control and monitor many more points, directly from the cooling units' processors, than a proprietary protocol would allow. The Quintiles project also includes integration with Trane chillers and a Lutron lighting system.

With the Web-based Trend system, mechanical engineers and Quintiles facilities staff can remotely monitor the building whenever necessary. The 963 front-end software acts as a Web server, allowing access to the graphical displays from a Web browser such as Internet Explorer and enabling authorized users to fine-tune any aspect of the substantial mechanical system. The security system in 963 ensures that users are only presented with information and functions that are relevant to their authority or task.

"Before, if a problem occurred at the site and I went out there, even though the site is only a half-hour away, I still had to call the building guy to meet me there, too," Rogers said. "So remote monitoring saves everybody time—I'd say two to four hours if any given event should occur."

The AFS team attended regular meetings with all the engineers, who presented different options on design, base building, mechanical, and fit-up. The options were fine-tuned and value-engineered items were debated to see where they added actual value to the job. When everything was in place, AFS worked with commissioning agents to identify and achieve LEED certification.

The Trend system inside Quintiles' new world headquarters monitors the HVAC system performance to ensure it operates at peak efficiency, garnered the maximum possible number of HVAC LEED points, and contributed to the building's LEED-Silver rating certification. The flexible system reflects the needs required by all of the stakeholder engineers, and seamlessly accommodates on-the-fly changes as the Quintiles facilities staff continues to identify more ways to reduce costs and consumption.

"Being Web-based, easy to access and requiring zero experience to run through, the Trend system enables me and my engineers to identify and fix any problem before the owner even knows it exists," Rogers said.

"This project truly is the crown jewel of the Imperial Center," said Greg Sanchez, president of TriProperties, Inc., the company that developed and manages Imperial Center.

Completed by
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Project Scope

- 1 operator workstation with 963 Server software
- 240 IQLVAV controllers
- 2 IQ3xcite controllers for central plant control
- 1 IQ3xcite-XNC controller for BACnet integration to 8 Liebert units
- 10 IQ3xact unitary controllers for air handling units
- 9 I/O expansion modules
- 11 IQL16 unitary controllers for fan-coil units
- 15 Honeywell variable frequency drives