



Denison University: An award-winning energy upgrade for F.W. Olin Science Hall

SmartStruxure™ solution with wireless controllers improve operational and energy efficiency in historical building

Founded in 1831, Denison University in Granville, Ohio, is one of the earliest colleges to be established in the old “Northwest Territory,” the area west of the Allegheny Mountains and north of the Ohio River in central United States.

Recently, the university decided to upgrade the F.W. Olin Science Hall’s HVAC and lighting systems to make them more efficient and to improve student and faculty comfort.

The project presented several major challenges. Since the building had been recently renovated, it was essential that the work not damage or compromise the interior. As a science building, special attention needed to be paid to air quality and consistency to ensure that lab experiments could be performed reliably. And finally, the timeline was extremely tight because the work had to be

completed between the spring and fall semesters, and around summer research programs.

Choosing a trusted partner

To meet these challenges, Denison turned to Schneider Electric™. The university had been working with Schneider Electric for many years, and was already using the company’s SmartStruxure™ solution building management system (BMS) to monitor and control energy use over most of the campus. In fact, Denison University was one of the first sites to install SmartStruxure solution when it was introduced.

The integrated solution includes Enterprise Server and WorkStation Professional software for campus-wide system operation. Buildings have at least one Automation Server with TAC Xenta™ field controllers connected to HVAC equipment,



Denison University’s mission statement is “to inspire and educate our students to become autonomous thinkers, discerning moral agents and active citizens of a democratic society.” Part of that commitment is to be environmentally responsible and operate in a sustainable fashion.

including air handling units, boilers, chillers, cooling towers, variable air volume terminals and fan coil units. Some buildings that had Schneider Electric's TAC I/NET™ legacy controls were migrated into the Enterprise Server to simplify day-to-day operations.

"Since we already had SmartStruxure solution on campus and our buildings' DDC system needed upgrading, it made sense to work with Schneider Electric, especially when the wireless solution was proposed to help reduce costs and disruption in the occupied building," said Denison University's Director of Facility Services, Art Chonko.

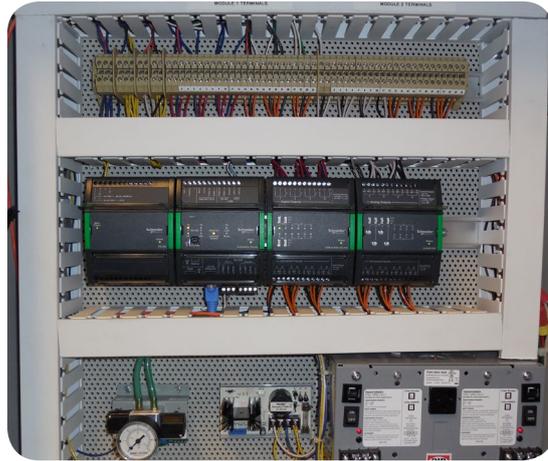
The Schneider Electric team realized that wired systems alone would not work in this historical building. They proposed installing Multi-Purpose Managers (MPM), the core of the SmartStruxure Lite solution, as wireless gateways to the campus-wide BMS. Because MPMs can communicate wirelessly and seamlessly with SmartStruxure solution, installation was quick and posed minimal disruption to the science hall's operations. Together, these solutions proved to be the perfect combination for Denison's building management needs.

Schneider Electric coordinated with the Denison team to identify critical labs and equipment that required special protection and/or environmental conditions. The project team worked closely with the mechanical contractor and facilities staff to work around the timing constraints.

A complete energy make-over

Denison's goal was to incorporate as many energy-saving improvements as their budget allowed and the architecture permitted. To accomplish this, Schneider Electric created a hybrid system of wireless and wired technology that improved performance of all of the systems in the science building.

Each room was equipped with new digital HVAC controls to replace the existing TAC I/NET system that can be programmed for desired setpoints, along with occupancy sensors that activate and deactivate lighting, heating, and cooling based on whether or not the room is in use (except for certain lab rooms that are maintained at a constant temperature). Two-way heating and cooling valves combined with variable frequency drives on the heating and cooling pumps were installed to reduce electric consumption by operating as system demand requires.



Wired and wireless controllers are linked to the campus-wide SmartStruxure solution BMS.

Controllers are networked through MPM-UN2 wireless programmable controllers mounted in the ceiling of each room, which in turn communicate with an MPM-GW wireless control network gateway on each floor. Finally, the entire building is linked to the campus-wide SmartStruxure solution BMS, allowing remote monitoring and control of all HVAC and lighting systems.

Immediate and long-term savings

Denison University realized immediate results upon completion of the project at F.W. Olin Science Hall. The school reports that energy costs have dropped considerably, and the Denison team has noticed that due to enhanced occupant comfort, productivity for both the faculty and students has also improved. What's more, the facilities team uses the StruxureWare™ Energy Operation dashboard to view energy trends and reports, allowing them to be proactive regarding energy consumption issues.

Conclusion

Upgrading historical buildings is always a challenge, and that challenge is multiplied when there is a short timeline for completion. By choosing Schneider Electric as a partner with a wide range of solutions willing to work closely with the school and the other contractors, Denison University was able to achieve a significant improvement in energy performance and occupant comfort.



The F.W. Olin Science Hall renovation earned a 2015 Environmental Leader Product & Project Award from Environmental Leader magazine.

"HVAC refurbishment of existing buildings, especially those that were built some time ago as in this case, are tricky, so successful projects like this should be showcased in order to get more building owners updating their HVAC systems. The campus-wide building automation system in addition to the short timeline of completion are impressive."

- Environmental Leader Product & Project Awards judge

