TEC SYSTEMS INC.

CASE STUDY

BUILDING AUTOMATION CONTRACTORS

Congregation Shearith Israel

Takes A Leap With LonWorks®

Congregation Shearith Israel, the Spanish and Portuguese Synagogue in the City of New York, was founded in 1654 as the first Jewish congregation to be established in the United States. Today, the landmark synagogue is one of the most spectacular houses of worship in the city of New York and a rare surviving example of early Victorian religious architecture. The present synagogue is constructed in the style of Spanish and Portuguese congregations, preserving part of the congregation's seventeenth century building, and highlighting the continuity of the generations in Shearith Israel.

Although elements such as the exterior façade and other envelope features have not warranted any major renovations in recent years, the same could not be said of the heating, ventilation and air conditioning (HVAC) system. The existing facility automation system, adorned with an antiquated configuration for monitoring and controlling environmental conditions and processes, lacked the energy efficient and cost minimizing innovations that has revolutionize modern day building automation systems. Not only was the system deficient in productivity, it locked the facility into a single vendor for both service and installation. In lieu of adding to the existing infrastructure, which was the poorest of options, overseers at the congregation wanted to take advantage of the many emerging technologies that have continued to offer better opportunities for effective facility management. The plan was to have an open protocol control system that could use the facility's local area network as the communications backbone.

Following an audit of the entire mechanical plant, the facility embarked on its most ambitious project in the spring of 2002: the upgrade of the building management system (BMS) into a state-of-the-art monitoring and controlling setup. The project would include new direct digital controls (DDC) for the existing air conditioning units.

A New, More Efficient Design

Working with the mechanical contractor and the facility, T.E.C. Systems proposed the use of interoperable LonWorks® controllers for plant and system control throughout the facility. T.E.C. Systems, member of the LonMark Interoperability Association, would also have to expand existing configurations to incorporate DDC for:

- Unit start and stop controls
- Direct expansion (DX) cooling
- Reheat coil staging
- Freeze-stats
- Discharge and return air temperature

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Project Team

Owner & Developer: Congregation Shearith Israel, NY

Design Engineer: Landmark Facilities Group, NY

Mechanical, Electrical & Plumbing Engineer: Heritage Air Systems, NY

Key Benefits

- Enhanced flexible control of mechanical equipment
- Cost-reductions
- Easy changes and upgrades
- Better integration and automation
- Rapid return on investments

controls
- Liquid sensors
- Outside air damper actuators

Utilizing the LonWorks® platform, T.E.C. Systems augmented the facility's local thermostat control setup with a fully automated configuration implicit of open and interoperable programmable devices, and an integrated monitoring front-end. To meet the interoperability challenge, a number of certified LonMark products from LonMark Association members were specified. The LonMark certified Neurologic space temperature sensor, and LonPoint Router and Node for example, communicating with certified field controllers to provide zoned control throughout the facility. The utilization of theses components enables rapid exchange of information and interaction with other devices to provided optimum environmental conditions.

The installed devices communicate over a common network with no I/O wiring required for sensors or actuators. With field devices providing direct monitoring and control capabilities over the network, thus eliminating "homerun" wiring and the necessity for conventional I/O hardware, the project resulted in decreased installation costs and increased flexibility and available data. With the networked field components containing the controls sequence of operations, each air conditioning unit system can operate on a stand-alone basis; independent of a central panel or PC.

Increased Monitoring Capabilities

To be most efficient, Echelon's LonWorks Network Services (LNS) technology was incorporated with Honeywell's SymmetrE™ graphical user interface (GUI) workstations, which would not only maximize plant efficiency, but as well allow for easy future upgrades and expansions. In harmonizing all the different devices and subsystems, T.E.C. Systems selection of the SymmetrE™ front-end computer system represented the best available application from the marketplace. SymmetrE™ is a true open system, specially designed to offer better flexibility to expand and integrate with Honeywell and third-party applications, and better value over the entire building life cycle. In addition this improved, front-end system encompasses building maintenance features such as global scheduling, alarm paging, integrated maintenance manager, and phone control.

T.E.C. Systems provided a new multi-point graphic "mimic" panel to integrate the existing hardware through the new SymmetrE™ network. All field control information, including: sensor readings, equipment statuses, set points, etc. are viewable at the front-end. The simplicity of SymmetrE™ allows operators to monitor and adjust system parameters easily including alarming, trending, and schedule modifications. The system's operating workstation is connected to The TP/FT-10 communication backbone via LonWorks PCLTA Network adaptor. The system's protocol, LonTalk, allows for future seamless integration with other manufacturer equipment whether it be HVAC, lighting, fire alarm, or security.

Building for the Future

As the lone Jewish congregation in New York until 1825, Shearith Israel provided for all the needs of the Jewish community for nearly one hundred eighty years. With this latest upgrade, the congregation has assured its congregates access to a comfortable, and energy efficient facility where they can gather and experience a wealth of archival material and historic artifacts reflecting the American-Jewish experience for almost three and a half centuries.

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