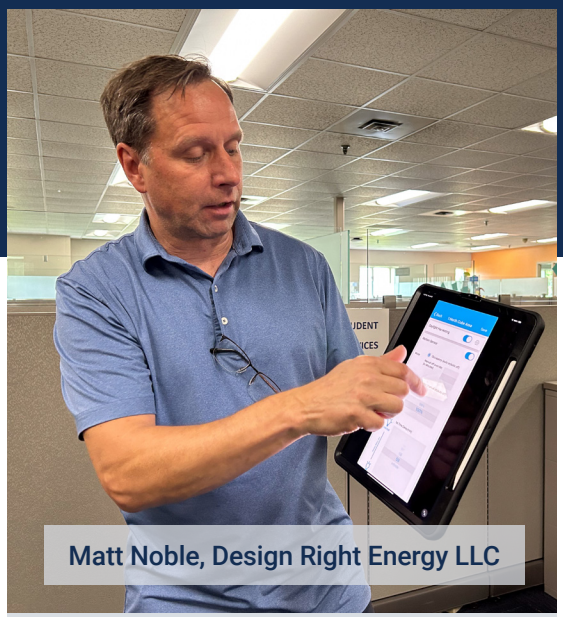
LLLC
Luminaire-Level Lighting Controls

CASE STUDY

How LLLCs Deliver More Than Basic LEDs


Matt Noble, Design Right Energy LLC

When it came time to replace its outdated lighting system, Intermediate District 287 (ISD 287) sought to improve the quality of the lighting for its employees, save energy, and incorporate more control and flexibility into the system. ISD 287 serves 12-member school districts across Minnesota, providing innovative, specialized services to help each district meet the unique learning needs of its students. So, when ISD 287 looked to modernize the lighting system in one of its 60-year-old buildings, the team saw an opportunity to go beyond basic LEDs. A luminaire-level lighting control (LLLC) system was the perfect fit.

LLLCs are a proven technology comprising individually programmable luminaires that contain embedded sensors and compact control components, allowing each fixture to respond to occupancy, daylight, high-end trim, and even more opportunities for building operators.

GETTING STARTED

ISD 287's three-story, 66,763 square foot facility in Plymouth, MN is mostly office space with a small portion of the building used as warehouse space. Before the retrofit, the building had outdated and yellowing lighting, consisting of linear fluorescent, compact fluorescent lamps, and HID fixtures, with no controls in place. Lights were often left on too long or in unoccupied spaces, wasting energy, and money.

To get the most of their lighting upgrade, ISD 287 worked with a trusted partner, Design Right Energy, which conducted a thorough assessment of the facility identifying occupancy patterns, areas with strong daylight, and spaces with poor lighting. Based on the assessment and interviews, the team recommended upgrading to LLLCs to achieve greater energy savings and take advantage of the added flexibility they LLLCs offer compared to a standard LED upgrade. Financial incentives also played a key role in supporting the decision.

PROJECT NAME:
Intermediate School District 287

LOCATION:
Plymouth, MN

PRIMARY OBJECTIVE:
Identify and install a lighting system that lowers energy costs, provides flexibility, and introduces more control.

"Prior to the upgrade… it was dark and dingy… not aesthetically pleasing at all."

– Lori, employee at ISD 287

The Luminaire-Level Lighting Control Initiative is a statewide program under Minnesota's Efficient Technology Accelerator, a partnership funded by the state's investor-owned utilities, administered by the Minnesota Department of Commerce, Division of Energy Resources, and implemented by Center for Energy and Environment.

THE SOLUTION

Early coordination was key, especially when it came to fixture layout, controls mapping, and securing incentives. The team selected MaxLite's c-Max Lighting Controls system, a user-friendly LLLC system well suited to the building's mix of open offices, cubicles, and warehouse space. The system enables LLLC and non-LLLC luminaires to be controlled together using wireless controls. The system's control features, like occupancy sensing and timeclock adjustments, gave ISD 287 the flexibility to fine-tune settings without relying on external support. In total, 819 fixtures were retrofitted or replaced across the building, and 586 of them featuring MaxLite's c-Max system.

Once installed, Design Right Energy programmed the new system. Throughout the building, high-end trim of 50% was utilized to limit energy consumption without sacrificing occupants' needs, as most spaces were over-lit. In addition, light sensors integrated into the luminaires trigger a dimming response to natural light available, enabling luminaires adjacent to windows to reduce the luminaire light output and lower energy use. When occupancy sensors detect the spaces are vacant, lights are dimmed to 20% before turning off after a preset time. This upgrade is estimated to achieve annual energy savings of 245,651 kWh compared to the previous lighting system.

THE RESULTS

Once work began, installation went quickly and without major disruption thanks to careful planning. The full project, from early design to final commissioning, took about six months. The upfront planning paid off, especially when it came to fixture layout, controls mapping, and lining up rebates. Pre-labeling fixtures also helped streamline installation and programming.

To help offset the cost of the project, Design Right Energy engaged Center for Energy and Environment's (CEE) One-Stop Efficiency Shop program team and secured a rebate of $75,575. They also reached out to Efficient Technology Accelerator's LLLC Initiative for support and to participate in its demonstration project pilot and receive additional financial support of $36,000.

Beyond energy savings, the project shows how thorough planning and the right product choice can lead to a successful LLLC installation, even in a 60-year-old building. ISD 287's team now has control flexibility with the ability to adjust settings without external support.

This project is part of the growing effort by LLLC Initiative to promote better lighting solutions that are both efficient and practical. By spotlighting real-world examples like ISD 287, the LLLC Initiative encourages building owners and facility teams to feel confident installing LLLCs as a flexible, user-friendly system, not just for new builds but also for existing buildings ready to take the next step beyond basic LEDs.

"Smooth project with very quick turnaround, much had to do with labeling and accurately mapping fixtures; lots of open, no irregular spaces."

– Troy T., Supervisor, Facilities Maintenance

LESSONS LEARNED

1. **Proper programming is key. Take quality notes and record system changes.**
2. **Occupant comfort is equally important to energy savings in occupied buildings.**
3. **Maximize financial options such as rebates, tax credits, and deductions to offset costs.**

HOW TO GET STARTED

For more resources on LLLC systems or help understanding if the technology is right for your next project, contact our team at **info@mnLLLC.org** or visit **www.mnLLLC.org.**