



## PoE Lighting Improves Firefighter Preparedness and Response



**Located in the greater Cincinnati metropolitan area along the busy I-75 corridor, the Evendale Fire Department is a full-time organization established in 1959 to protect the now more than 3,000 residents of the village of Evendale. With calls coming in at all hours, Evendale firefighters often have to spring into action within seconds of waking up to harsh flashing lights and alarms blaring. Leadership at the fire department recognized that there must be a way to improve this system to make the transition from deep sleep to action more accommodating and gentler for the firefighters, while also enhancing the ability to distinguish between distinct types of emergencies.**

## Opportunity with PoE Lighting

Firefighters have one of the most difficult and dangerous jobs, risking their lives every day to save others. Emergency alarms can occur at any time of the day or night, and studies show that being abruptly woken from sleep can result in longer persistence of grogginess and have a significant impact on the health of these individuals. At the Evendale Ohio Fire Department, this was no exception.

**Solutions:** Category 6A UTP Cable, Z-PLUG Field Terminated Plug, Z-PLUG Termination Tool, and Wall-Mount Cabinet

**Services:** PoE Lighting

**Vertical:** Government

**Location:** Cincinnati, Ohio

“In the middle of the night when firefighters are fast asleep, it is not easy for them to go from 0 to 150. I saw my team being abruptly woken up and knew there had to be a better way,” says Bob Murray, Captain of the Evendale Fire Department. “There have been studies done about gentler ways to wake firefighters up through technology, and we saw an opportunity to do this with lighting.”

After receiving a grant to update their department’s technology and learning about the benefits and possibilities of PoE-enabled LED lighting from local Siemon certified Digital Lighting Partner (DLP) Cabling Specialists, Inc., the Evendale Fire Department became interested in the ability to integrate a digital lighting system with their existing emergency alert systems.

“When we originally proposed PoE lighting, we were primarily thinking about the energy savings and maintenance benefits,” says Martin Watkins, project manager for Cabling Specialist, Inc. “But as we really delved into the capabilities, it was exciting to discover how we could leverage the technology to provide emergency notification that allows first responders to more efficiently save lives. It is an ideal and legitimate solution for these purposes—if you think about it, lights flashing or changing colors is going to get more attention.”

## A Platform for Integration

To provide data connectivity and power distribution for PoE lighting fixtures throughout the station, the Evendale Fire Department leveraged Igor’s Nexos IoT smart building platform that communicates with Igor’s PoE-enabled IP-based network nodes integrated into each light. These nodes act as intelligent hubs for the lighting network that provide an interface for transmitting power and data to and from lights from PoE-enabled network switches, while also enabling integration with existing emergency alert systems through the Igor Gateway software. This centralized software system collects real-time information from the existing alert system and controls the lights to respond accordingly with red lights flashing for fire calls and blue lights for EMS calls.

“Through the Gateway software, we were able to integrate with the existing location alerting and dispatch system and tune the lights to provide distinct color schemes for indicating either an EMS or fire emergency, or combination thereof,” explains Andrew Pospisal, Director of Hardware Engineering for Igor. “Because LED lights can be intelligently controlled, the fire department was also able to program the lights in the bunk room to gradually illuminate and wake the firefighters more gently when a call comes in versus typical harsh lighting that instantaneously goes from dark to light and makes it difficult to physically transition from sleep.”

The Evendale Fire Department was so impressed by the system capabilities, they decided to also integrate the PoE lighting system with their existing Midland weather alert system, as well as the department’s doorbell system to visually indicate visitor arrival. The integration of the three separate systems is enabled by the Igor Nexos platform’s ability to gather data from third-party IP and non-IP objects using disparate communications protocols, essentially turning them into intelligent endpoints by transforming the data into IP-based information for aggregation and analysis on a common interface. The intuitive platform also allows the Evendale Fire Department to easily adjust color and illumination, blinking patterns, timing, and fade rates of individual lights as needed—all via their on-premises Windows-based central computer.

“The totally programmable Igor system makes it simple to adjust settings quickly to meet the needs of the department. The color-changing capabilities and integration with our existing systems are a game changer for our team,” says Murray. “The solution was

simple to implement and easy to use and control, allowing us to quickly and positively impact department operations.”

While the Evendale Fire Department’s PoE lighting system is a standalone, on-site system, the Igor Nexos platform also connects to a powerful cloud analytics option. This allows Igor to monitor the system to ensure ongoing performance and accuracy, as well as perform data analytics that they can leverage to gain insight for developing future capabilities and assisting customers with similar needs.

## The Right Products and Partners

When it comes to supporting advanced digital lighting applications and delivering PoE power to the individual Igor node-based lighting fixtures, a well-designed structured cabling infrastructure comprised of high-quality cables and connectivity play a vital role in ensuring maximum system performance.

With today’s higher levels of remote powering required for LED lights (typically 48 Watts or higher) comes the potential for heat buildup within cable bundles, which can lead to power and efficiency losses, performance degradation through increased insertion loss, and the premature aging of jacketing materials. This can especially be a concern in warmer temperatures that can exist within the plenum space above dropped ceilings. For the PoE lighting system, the Evendale Fire Department selected Siemon’s Category 6A UTP cables with PowerGUARD™ technology that are qualified for mechanical reliability in high temperature environments up to 75° C. These cables offer extremely stable transmission performance and superior support for PoE.

The ability to easily deploy PoE lighting fixtures can also be achieved using plug-terminated links where custom-length network cables are terminated onsite directly to RJ45 plugs for direct connections into the fixtures. Siemon’s innovative field-terminated Category 6A Z-PLUG was used to create custom-length direct connections to the lighting fixtures at the Evendale Fire Department. These plugs offer superior performance and are easily terminated with the user-friendly Z-PLUG termination tool. They also feature a shorter plug design with rounded edges that makes them easier to connect in tight spaces.

All of the network links to the lighting fixtures originate via patch panels connected to a PoE-enabled 90W Ethernet switch housed in Siemon’s sturdy and secure Wall-Mount cabinet, along with the Igor Nexos server. The Wall-Mount cabinet saves valuable floor space and protects the equipment from dust, while ensuring superior cable management and easy access to equipment.

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In addition to having the right infrastructure components, the deployment of a PoE lighting system is best carried out by experienced lowvoltage installers who understand the nuances of supporting PoE lighting applications and can ensure a quality, cost-effective installation that maximizes performance. Siemon’s Digital Lighting Partner (DLP) certification program, which is part of Siemon’s ConvergeIT Solutions for Intelligent Buildings, was specifically developed for Siemon certified installers such as Cabling Specialists, Inc., to seize the opportunity that comes with the growth of PoE lighting.

“PoE lighting is rapidly gaining ground in the commercial construction industry, and the market is expected to grow at a rate of more than 35%, reaching more than \$1.7 billion in the next five years,” says Bob Allan, Global Intelligent Buildings Solutions Specialist for Siemon. “That is precisely why we developed the DLP certification—to provide the training, partner network and sales support our installers need to effectively deploy PoE lighting systems and jump on the opportunity to grow their business.”

As a DLP, Cabling Specialists, Inc. is also strategically aligned with Siemon partners like Igor, forming a partner ecosystem that offered the Evendale Fire Department the value of a likeminded collaborative approach with strong lines of communication. Through partnership, Siemon, Igor and Cabling Specialists, Inc. together ensure that components are optimized to work together, logistics and technical support are topnotch, and deployments are accomplished with a common goal of preventing gaps, facilitating predictable and controllable expense, and meeting all the needs of the customer.

“Prior to becoming a Siemon DLP, our knowledge and experience with PoE lighting was limited, but we learned a lot through the training and acquired a good frame of reference to embark on PoE lighting opportunities,” says Watkins. “This technology is a real cross-over opportunity from networking to utility, and it’s exciting to be part of this cutting-edge technology. As a DLP, we now take pride in being able to bring the benefits of PoE lighting to our customers. The Evendale Fire Department project has already proven that it offers significant opportunity for our business that we hope to expand upon.”

## The Valuable Outcomes

In addition to the benefits of healthier, human-centric lighting for emergency, weather, and doorbell alert systems, the intelligent Igor PoE-based platform and Siemon low-voltage cabling infrastructure enabled the Evendale Fire Department to eliminate the cost of hiring electricians to deploy AC power to the fixtures. In fact, each low-voltage cable that runs to a PoE lighting fixture costs about 75% less than an AC power run for a more cost-efficient installation. The PoE lighting fixtures are also more aesthetically pleasing than standard emergency lights and available in a variety of designs, including 2X2 ceiling troffers and downlights. This allowed the fire department to create an overall more inviting, pleasing environment with the emergency alert systems built into the lighting system.

Bob Murray and his team couldn't be more pleased with the outcome of the integrated PoE lighting installation. "Working with Igor, Siemon, and Cabling Specialists, Inc. was a fantastic experience—it was clear that they all wanted to ensure this project was a resounding success, and their teams were always available to answer our questions. That level of service was essential to the positive impact this technology has had for the firefighters here at the Evendale Fire Department," he says. "We are very excited about the possibilities that intelligent lighting technology has to offer for our industry. I believe Evendale can be a showpiece, and I look forward to sharing this innovative technology with other fire departments."

The final outcome of the Evendale Ohio Fire Department's PoE lighting deployment resulted in the following benefits:

- More efficient response times and improved cognitive functioning for firefighters with the ability to tune lighting color and illuminate lights gradually for an easier transition from deep sleep.
- Better preparedness via visual indication for more easily distinguishing between EMS, fire, and weather emergencies, as well as station visitors wishing entrance.
- Healthier, aesthetically-pleasing environment via greater fixture options and advanced LED lighting technology that reduces glare, decreases stress and headaches, and has a much lower environmental impact than traditional incandescent and fluorescent lighting.
- Lower total cost of ownership via less energy consumption, the ability to eliminate AC power deployment, and reduced maintenance due to the significantly longer lifetime of PoE lighting fixtures.
- Improved reliability, flexibility, and scalability with PoE power delivered over the low-voltage infrastructure and the ability to easily adjust and expand system capabilities as needed.