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Mouser Electronics:
Fusing Warehouse Efficiency and Sustainability with PoE Lighting

OVERVIEW

Mouser Electronics, a Berkshire Hathaway company, is one of the world's largest electronic distributors with cutting-edge warehouse automation that enables nearly perfect pick-and-ship

24/7 operations for more than 6.8 million products from thousands of manufacturer brands—from semiconductors, memory and data storage to computing equipment, sensors, connectivity, displays, and more.

- **60% reduction in copper** over traditional LED lighting
- **100% reduction in steel** by eliminating conduit
- **Up to 20% reduction in energy consumption** with less AC-to-DC conversion

THE CHALLENGE

Mouser celebrated its 60th anniversary in 2024 with a bang – a massive 416,000-square-foot (ft 2) expansion to its existing 1-million-ft 2 Dallas-Fort Worth distribution center. But Mouser isn't just focused on fast, accurate distribution for exceptional customer service – they're also champions of sustainability. To that end, Mouser decided to deploy a connected PoE lighting system whereby a single Ethernet cable provides low-voltage DC power and enables network communication to each lighting fixture. They needed the right design strategy and infrastructure technologies that would ensure ease of installation and maximum efficiency, cost savings, and return on investment.

SOLUTION

Mouser turned to their long-term MEP firm Baird, Hampton and Brown (BHB) and electrical contractor Trico Electric to design the lighting layout and determine the infrastructure specifications. Based on their previous experience with the renowned Fort Worth Sinclair Hotel, BHB and Trico recommended AGILE-CORE™ from Sinclair Digital. AGILE-CORE™ is the first lighting and power distribution system to use safe and cost-effective low-voltage DC power technologies for improved efficiency and control of lighting fixtures for large spaces like the Mouser warehouse.

The AGILE-CORE™ system combines the best attributes of PoE-based technology for powering lighting fixtures with emerging fault-managed power (FMP) that provides a more sustainable DC power distribution infrastructure. Pioneered as Voltserver's Digital Electricity™ (DE) and adopted as Class 4 power in Article 726 of the 2023 edition of the National Electrical Code (NEC), FMP technology provides low-voltage shock and fire safety levels but with much greater power and distance capabilities. With the combination of PoE and FMP DC power technologies, the AGILE-CORE™ system improves efficiency by eliminating losses associated with AC-to-DC conversion. It also significantly reduces cost and material with smaller, lightweight cables compared to conventional AC power distribution and faster plug-and-play installation without conduit.

For the Mouser warehouse, the AGILE-CORE™ system consists of hybrid copper-fiber cabling from a headend location that provides FMP and network connectivity to distributed building infrastructure transmission system (BITS) 6U enclosures, each covering 10,000 square feet. This distributed architecture reduces the amount of cable throughout the facility and eliminates the need for extensive IT closets and associated power and cooling requirements. By eliminating the need for conduit, the AGILE-CORE system also improved aesthetics and made for an overall cleaner installation with the smaller Ethernet cables easily concealed inside ceiling I-beams.

Within each AGILE-CORE™ BITS enclosure, power distribution modules transfer the FMP to high-voltage DC power for powering two 24-port PoE switches that deliver up to 90 W of standard-based PoE (IEEE 802.3bt Type 4) to nodes that provide the control and power interface for PoE lighting fixtures, occupancy sensors, wall switches, and other PoE-enabled endpoints such as cameras and wireless access points. A total of 1,678 nodes were deployed throughout the warehouse, including a single node for each 80W high-bay fixture in the main warehouse and additional nodes for powering multiple lower-wattage fixtures in other areas, such as back offices and restrooms.

OUTCOME

Unlike conventional LED line voltage systems that have become increasingly complex to control, the AGILE-CORE™ system is backed by a robust centralized platform where all control resides in software, allowing Mouser to granularly adjust the thousands of fixtures across the facility from any location, including customized preset scenes that cater to the lighting requirements of a specific space. It also eases integration with other building systems and provides Mouser with complete visibility into energy consumption, allowing them to identify further optimization opportunities to maximize energy savings and prove savings for increasingly stringent energy code requirements.

Building a new warehouse from the ground up gave us an opportunity to take advantage of PoE lighting. It was ultimately the responsible choice, both sustainably and financially."

Kodiak Chadwick, Facilities and Physical Security Director

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