Huge Selection and Personal Service

Remee WIRE & CABLE™

Engineered With You In Mind

CLASS 4 FAULT-MANAGED POWER CABLES FOR LED LIGHTING SYSTEM

Case Study

Remee & Sinclair Digital Provide the Largest LED Lighting System Powered by Class 4 Fault-Managed Power for Mouser Electronics

A large-scale PoE lighting project utilizing Class 4 Fault-Managed Power (FMP) helps Mouser Electronics, a TTI, Inc./Berkshire Hathaway Company, save energy, add flexibility to spaces, and reduce materials.

Recently celebrating its 60th year, Mouser, one of the industry's largest global distributors of electronic components, has added a more than 413,000 square-foot expansion to its 1 million square-foot distribution center in Mansfield, TX. Mouser isn't just focused on fast, accurate distribution for exceptional customer service – they're also champions of technology and sustainability.

Sinclair Digital Services, Inc. was chosen to provide and commission all the equipment for this project, including headends, distribution enclosures, VoltServer equipment, and lighting fixtures. They specified Remee Wire & Cable's PowerPipe™ hybrid distribution cable for all data and power connectivity.

The new facility features a connected Power- over-Ethernet (PoE) lighting system, with a single Remee PowerPipe™ Class 4 FMP Ethernet cable providing low voltage DC power and enabling network communication to each lighting fixture and control center.

The DC power infrastructure eliminates losses associated with AC-to-DC conversion, reducing Mouser's carbon footprint while improving lighting control and lowering operational costs. Remee's PowerPipe™ hybrid cable is part of its larger line of Activate™ Power Distribution Cables. PowerPipe™ cables meet the new UL 1400-2 standard for Class 4 FMP systems and are rated CL4P or CL4Z.

An integrated occupancy motion and daylight sensor in each high-bay fixture optimizes energy use, while data-driven centralized control and management allow for adjusting lights and tracking energy consumption.

First Place Winner!

Most Intelligent Building Project - DC Powered

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Headends include servers, network switches, and transmitters connected with Remee's PowerPipe™ Class 4 FMP hybrid cable to provide power, connectivity, and control for the PoE lighting system at Mouser Electronics.

Each of Sinclair Digital's AGILE-CORE BITS distribution enclosures provides PoE lighting with Remee's PowerPipe™ Class 4 FMP hybrid cable connected to each LED fixture with up to 1,000-foot runs, covering 10,000 square-feet of warehouse space.

Why Mouser Chose to Employ a Fault-Managed Power System

While many PoE lighting systems connect to AC-powered PoE switches, Mouser's new warehouse also deploys a DC power distribution infrastructure that further reduces energy, material, and labor while providing centralized control. The distribution system uses Fault-Managed Power (FMP) which was adopted as Class 4 power in the 2023 edition of the National Electric Code (NEC).

A Fault-Managed Power system utilizes devices to intelligently detect faults and stop transmission, limiting the amount of energy that can go into a fault. This provides the same shock and fire safety level as Class 2 systems, but with greater power and distance capabilities. The system uses smaller and lighter weight cables than required for AC power distribution, and enables faster, safer low-voltage installation without conduit. The result is "touch safe" electrical transmission at high power levels. This "clean power" also eliminates sags and surges.

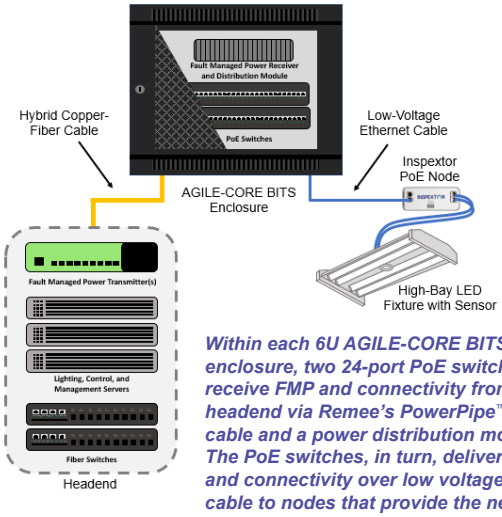
This innovative FMP technology, also referred to as Digital Electricity™* (DE), pulse power, or packet energy transfer, leverages pulse transmission to deliver significant power over long distances, in a similar manner as data packets travel over enterprise networks. As a line powering system, it is a means of energizing remote equipment from a centralized location over copper twisted pairs or hybrid cables with Class 4 fault managed power.

Remee's fault-managed "PowerPipe™ cabling solution for safe power distribution is part of the Activate™ by Remee line of Powered Cable Solutions.

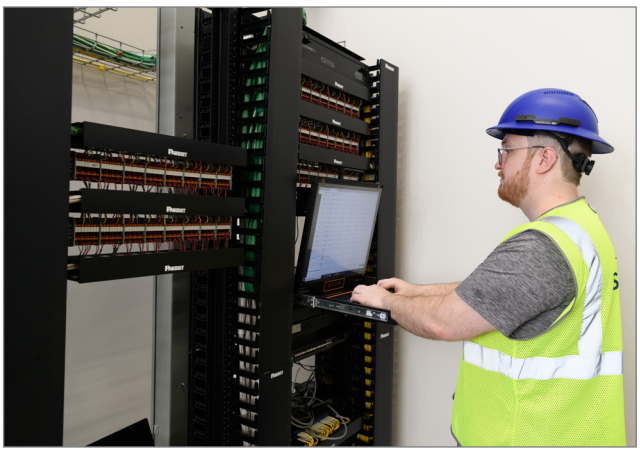
> *"We chose Remee to supply the quality cable we needed because they were at the forefront of Class 4 FMP technology and have been doing this longer than anyone else. In addition to providing us with a custom cable design, they helped us reduce labor costs and waste by providing a hybrid cable with fiber optic strands and copper cable pairs under one jacket, requiring only one cable pull."*
>
> *- Hannah Walker,*
> *Chief Operating Officer,*
> *Sinclair Digital Services, Inc.*

**Trademark of VoltServer, Inc.*

> *"The control we have over the lighting system allows us to implement load shedding for greater energy savings and makes it easy to adjust lighting levels based on specific needs. There are many unique features that we can tap into. For example, we can turn down lights above an automated conveyer system or turn them up in areas where workers need more lighting for the task at hand."*
>
> *- Kodiak Chadwick,*
> *Director of Facilities and Physical Security, Mouser Electronics*



Within each 6U AGILE-CORE BITS enclosure, two 24-port PoE switches receive FMP and connectivity from the headend via Remee's PowerPipe™ hybrid cable and a power distribution module. The PoE switches, in turn, deliver PoE power and connectivity over low voltage Ethernet cable to nodes that provide the network control and PoE interface for the light fixtures and their integrated occupancy sensors.



Remee's PowerPipe™ hybrid cable contains green jacketed copper cables the connect to the VoltServer transmitters, and a splitter feeds the yellow fiber cables to the switches.

The FMP Infrastructure

To maximize ease of installation, efficiency, and sustainability for Mouser's PoE lighting system, Sinclair Digital designed the system using its packaged AGILE-CORE lighting and BITS power distribution system that combines the benefits of PoE technology and FMP. VoltServer DE equipment was employed in each of two headends containing fiber switches, lighting, control, and management servers, and fault-managed power transmitters.

44 AGILE-CORE BITS distribution enclosures were installed throughout the warehouse, with each box receiving one cable from the headend with eight 16AWG copper pairs and two fiber strands. Several more enclosures are being added in ongoing project phases. PoE cables then run to each LED fixture with a sensor.

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, contributing to material, labor, and energy savings. In addition, the light fixtures can be easily and safely removed, added, or reconfigured without electricians.

Powering high-bay light fixtures in a conventional system requires 10AWG wiring and conduit. With the smaller 16 AWG to 23AWG Ethernet cables and no conduit, Mouser's new PoE lighting system uses approximately 60% less copper and 100% less steel.

Continued

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While many PoE lighting systems connect to AC-powered PoE switches, Mouser's new warehouse deploys a DC powered infrastructure using Class 4 fault-managed power (FMP). This further reduces energy, material and labor costs while maintaining centralized control.

Backed by robust centralized control, the Class 4 FMP lighting system allows Mouser to granularly adjust the thousands of fixtures across the facility, including customized preset dimming scenes that enable dimming lights within a zone by 25%, 50%, or 75% or brightening or dimming lights in 10% increments to cater to the illumination requirements of a specific space. It also provides Mouser with complete visibility into energy consumption, identifying further optimization opportunities to prove energy savings for increasingly stringent energy code requirements.

About Sinclair Digital Services, Inc.

Sinclair Digital is a full-service consulting, design/build, and project management firm specializing in DC power infrastructure that was founded by Sinclair Hotel owner Farukh Aslam.

Baird Hampton and Brown (BHB) was the engineering firm that has designed Mouser's electrical systems for nearly two decades, as well as the Sinclair Hotel project. The PE at BHB, Rhiannon Jones, knew that PoE was the future of lighting, so selecting Sinclair Digital was a perfect fit. She turned over the requirements to Sinclair Digital to design and deliver a robust infrastructure.

About Remee Wire & Cable

Remee Wire & Cable, a leading manufacturer of electrical and electronic wire and cable for over fifty years, provides an innovative line of Activate™ Power Distribution Cables which includes their family of PowerPipe™ copper and hybrid cables:

- Multipair Cables – 18, 16 and 14 AWG, unshielded or shielded rated and listed to the UL 1400-2 standard for CL4P
- Multipair Cables – 18, 16 and 14 AWG, unshielded or shielded, listed to the UL 1400-2 standard for CL4Z including Direct Burial, Sun Res and Wet Location
- Hybrid Cables – 18, 16 and 14 AWG CL4P (or CL4Z), plus Tight Buffered (or loose tube) SM/MM fibers suitable for Plenum or Riser applications

For more information about Remee Wire & Cable, please visit www.remee.com, email us at info@remee.com, or call **1-800-431-3864.**

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