How to protect industrial switches from lightning strikes



Overview

Ethernet systems need to protect against surge events that can differ by significant orders of magnitude.

Key Takeaways

Industrial switches can be protected from lightning strikes using a combination of surge protection devices, proper grounding, lightning rods, and careful wiring practices. Key Protection Strategies1. Surge Protection Devices (SPDs) Install SPDs near industrial switches to absorb and divert high-voltage transients caused by lightning.

These devices, also called surge arrestors or lightning barriers, operate almost instantaneously to provide a low-impedance path to ground, preventing voltage spikes from reaching sensitive switch components. Metal oxide varistor (MOV) types are commonly used for industrial applications and can handle large transient currents while restoring normal operation after the surge subsides. 2.

Grounding and Earthing Systems Proper grounding is essential. All metal structures, switch enclosures, and electrical panels should be connected to a low-resistance earth electrode. This ensures that lightning currents are safely diverted into the ground rather than through the equipment.

Grounding systems should be regularly inspected for corrosion or loose connections to maintain effectiveness. 3. Lightning Rods and Air Terminals For direct strikes, air terminals (lightning rods) intercept the lightning and channel it through down conductors to the grounding system.

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This prevents the strike from passing through the building or switchgear. Down conductors should be designed to minimize inductance and provide a direct path to the earth electrode. 4.

Wiring and Shielding Practices Use metallic raceways, cable shields, and twisted pairs to reduce the impact of induced surges from nearby strikes. Proper routing and separation of power and signal lines help minimize electromagnetic interference. Filtering components can also be added to block high-frequency transients while allowing normal operation.

5. Maintenance and Monitoring Regularly inspect surge protection devices, grounding connections, and lightning protection systems. Implement weather monitoring systems to provide early warnings of storms, allowing sensitive equipment to be unplugged or powered down if necessary.

Training personnel on lightning safety procedures ensures quick and effective response during storms. 6.

Multi-

Layered Protection Approach A robust lightning protection plan combines diversion (grounding), attenuation (shielded wiring), and suppression (SPDs) to provide comprehensive protection. This layered approach ensures that both direct and indirect lightning effects are mitigated, keeping industrial switches operational and safe. By integrating these strategies, industrial switches can be effectively safeguarded against lightning-induced surges, minimizing downtime and equipment damage.

Article Content

Best Methods for Protecting Against Surge Events in Ethernet and ...

Ethernet systems need to protect against surge events that can differ by significant orders of magnitude. A lightning strike that is thousands of meters away might cause an energy surge that is five orders of

Lightning Surge Protection for Electronics Equipment

Lightning EffectsElectromagnetic interferenceMagnetic/Capacitive CouplingEarth Potential ShiftsLightning ImpactProtection OptionsAir Spark GapsGas Discharge TubesSemiconductor DevicesVaristorsSurge protection devices can be used to protect electrical and electronic equipment from the potentially destructive effects of high-voltage transients. These devices are also known as surge arrestors, lightning barriers, and lightning protection. Surge protection circuits operate near-instantaneously to provide a low impedance path for conducting ...See more on resources.altium Jameco Electronics

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Switching Surges and Indirect Lightning Strike Protection

Although it is difficult to prevent all overvoltages caused by an electromagnetic pulse, it is possible to lessen them and fortify the systems that need to be safeguarded. Despite the huge amplitude of

Lightning Protection Systems in Industrial and Commercial ...

Protect food factories and industrial plants with lightning arrestors and surge protection. Learn the components, types, and engineering safety practices.

Lightning & Surge Protection for Buildings | SPD & LPS

Protect your building and electronics from lightning and power surges. Learn how SPDs, LPS, grounding, and multi-stage surge protection work

How to protect industrial equipment from being

Protect industrial equipment from lightning with surge protection, grounding, and regular inspections to prevent costly damage during lightning season.

Lightning protection guide

Just like its predecessors, this edition of the lightning protection guide offers assistance in installing profes-sional lightning protection systems in line with the very latest standards.

Lightning Safety: Complete Guide to Industrial Protection & Risk

Learn how to implement effective lightning safety and risk management protocols in industrial environments. Reduce downtime and protect assets with data-driven solutions.

Lightning and surge protection

Electronic equipment can be protected from the potentially destructive ef-fects of high-voltage transients. Protective devices, known by a variety of names (including ''lightning barriers'', ''surge arrestors '',

Overvoltage Protection Techniques & Equipment

This article discusses protective methods & equipment used against overvoltages. We delve into areas like protection against surges due to lightning.

Surge Protection

Surge protection matters most in environments with a high surge risk, for example near lightning conductors or in industrial areas with frequent switching operations. The main advantages of Surge

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The industrial PoE switch market addresses three critical pain points: environmental resilience against temperature extremes ranging from -40°C to 75°C, electrical protection against

Surge Protection Device: Type & Working Principle

Lightning strikes, power outages, or grid switching can all cause these voltage spikes. This makes surge protection critical for uninterrupted electrical

Surge Protectors Lightning Arrestors

And the only way to protect this sensitive equipment from lightning strikes and surges is with L-com''s HyperLink® branded data line lightning and surge protectors, including our bestselling LPXTRJ45

Protecting Industrial Facilities from Lightning Strikes

Case Studies: Real-World Examples Industrial Facility in Florida: A manufacturing plant experienced multiple lightning strikes, leading to significant

How to Protect Equipment from Lightning?

Introduction Lightning strikes pose a significant threat to equipment, causing damage and downtime that can be both costly and disruptive. To safeguard your valuable assets from the

Switching Surges and Indirect Lightning Strike Protection

Switching surges and nearby lightning strikes can damage electronics. Learn how surge protection devices protect equipment from dangerous voltage spikes.

Lightning surge protection for electronic equipment

Lightning protection — standards, devices and dangers The current Electrical Wiring Regulations (BS7671) refer to the British Stan-dard for Lightning Protection BS6651. This identifies two distinctive

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