



# Grounding and Best Practices for Rooftop Wireless Internet Systems

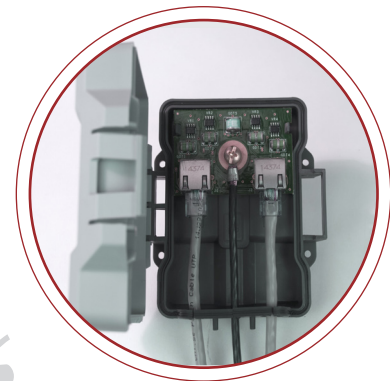
## Maintaining a Continuous Internet Connection

Is essential for business success in today's connected world, especially with the increasing reliance on cloud-based services. Downtime of networked retail point of sale (POS) systems, medical patient check-ins, order fulfillment centers, and other network-based equipment can lead to significant revenue loss, operational disruption, and customer dissatisfaction. Any internet connectivity disruption affecting POS equipment like

checkout registers, self-service terminals, chip card readers, and internal systems supporting order fulfillment can severely impact operations. Understanding the mechanics of internet continuity and connectivity failures due to electrical power disturbances and data loss is a key step in reducing and potentially mitigating these issues, helping to eliminate revenue loss, improve customer experience, and drive customer retention.

## Why Robust Connectivity is Essential

Traditional wired communications systems, such as copper or fiber, are typically dependable but not immune to failures caused by physical damage, service provider issues, or lightning surges during adverse weather conditions. Network resilience includes two key components: protecting wired networks from power disturbances or lightning surge events and adding redundancy with a wireless infrastructure to avoid connectivity loss. Installing backup wireless systems is not just a precaution, but a strategic move that ensures continuous operations and minimizes downtime. The performance and uptime of wired and wireless systems depend on electrical power continuity, proper grounding, and surge protection devices (SPDs) on all installed power and shielded twisted pair data cables. Installing SPDs is critical for protecting systems from electrical power quality events on the utility grid, weather-caused lightning events, or internal electrical power generated transients from the on/off cycling of equipment. But it is not just about installation, it is about adherence to relevant standards and codes. Compliance with standards such as TIA-607 for grounding and bonding requirements for telecommunications equipment, NFPA 70 for personnel safety, and NFPA 780 for lightning protection is not just a recommendation but a requirement from both local and national codes.



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## The Cost of Downtime

The total cost of service disruptions due to improper network protection and lack of reliable, redundant connectivity can be substantial. Direct financial costs due to hardware damage, data loss, and inability to process transactions compounded by reduced labor efficiency and potential loss of consumable products can reach hundreds of thousands of dollars per minute in sales loss for a nationwide retailer. Additionally, intangible costs, such as operational disruption and poor customer experience, can significantly impact your brand's reputation.

## Practical Solutions for Business Owners and Corporations

Consult with industry experts in networking resiliency, lightning protection, grounding, electrical power continuity, and IT services to bolster your business's network capabilities. Also, consider these recommendations for significantly reducing the risk of internet connectivity failures:

1. **Assess Your Network Resiliency:** Identify critical copper-based connected components within your network infrastructure that could be susceptible to electrical power and lightning surges. This includes roof, pole, or facility-installed/mounted equipment, as well as AC/DC powered and data equipment that can be affected by the electrical power grid or other external sources such as weather.
2. Ensure that all AC, DC, and PoE-powered equipment susceptible to electrical power or lightning surges are protected with adequately installed SPDs and properly grounded to mitigate surge events.
3. Consult with leading industry experts to determine the proper technology selection around low VPR/Vpl with a multi-strike rating and placement of surge protection device(s) for your application. Once identified, install the appropriate surge protection solution(s), and ensure proper bonding and grounding of protective equipment.
4. **Grounding Tips:**
  - Install a ground bar to collect the ground bonding conductors from the antenna, metallic support structures, communications cables shields, and associated equipment. Also, bond the ground conductors of surge protective devices to the ground bar.



- Bond the rooftop grounding system to the building's existing grounding infrastructure. This can be achieved by:
  - Connecting to the lightning protection system (LPS) if installed.
  - Bonding to the closest point of an exposed vertical grounded building steel.
  - Installing a dedicated grounding conductor to the site's grounding electrode system (electrical service grounding).
- Select grounding components that withstand environmental stresses such as wind, rain, and temperature fluctuations. Use corrosion-resistant hardware, such as stainless steel, and ensure all mechanical connections are secured and protected from the elements with antioxidants.
- Follow relevant standards and codes, such as NFPA 780 for lightning protection, TIA-607, and NFPA 70 for grounding and bonding requirements of communications equipment. Compliance ensures the safety and effectiveness of the grounding and installed communications systems.
- Conduct periodic inspections and maintenance of the grounding system to ensure its ongoing performance. This includes checking connections, testing resistance levels, and addressing any issues promptly.

Proper grounding and utilizing quality surge protection are often overlooked. Investing in these recommended solutions is a short-term necessity for long-term peace of mind for you, the business, and your customers.

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For more information on Transtector's protection solutions, visit [www.transtector.com](http://www.transtector.com) or contact us at +1 (866) 679-4552.