



Surge Protection Best Practices: Protecting PoE Cameras

White Paper

Transtector
10701 Airport Road, Hayden ID 83835
sales@transtector.com | [Transtector.com](https://transtector.com)
+1 (208) 635-6400

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Transtector has over 50 years of expertise providing surge protection devices (SPDs) to protect critical data signals, AC/DC, and RF applications. Transtector solutions are used to protect mission critical applications such as 9-1-1 call centers, datacenters, cell tower sites, missile defense applications, and many more.

PoE fed cameras are typically installed in harsh environments, requiring robust and reliable SPDs to ensure signal integrity.

Best practices to ensure signal integrity for PoE powered cameras include:

1. Utilize hybrid surge protection technology

A wide variety of SPDs exist in the market today. These SPDs utilize various technologies including gas discharge tubes, metal oxide varistors and silicon avalanche diodes. Each of these technologies has advantages and disadvantages. To protect critical data signals in a PoE-fed camera, Transtector recommends using a hybrid surge protection design which incorporates both silicon avalanche diodes (SADs) and gas discharge tubes (GDT). This design promotes the best repetitive performance and high energy surge capabilities, while eliminating costly maintenance. This hybrid solution will effectively protect critical data signals and prevent damage to the camera.

2. Protect both ends of the Ethernet line

Direct or indirect lightning strikes can induce energy onto Ethernet cables. In addition, nearby surge events that energize the earth around critical loads also pose major threats to outdoor installed PoE-fed cameras. Regardless of how the unwanted energy enters the cable, properly designed SPDs can repeatedly protect the system. Best practice is to install SPDs at both ends of the ethernet line, providing protection in either direction of the cable to shunt the surge energy away from the critical loads (PoE Camera and PoE switch).

3. Do not rely on the PoE midspan to protect critical devices

Some PoE midspan devices may include surge protection in their design. Relying on the midspan for primary protection is not a best practice as the PoE midspan device becomes the “sacrificial lamb” if the internal midspan surge component fails catastrophically. Using an external SPD in addition to the PoE midspan device (as outlined in 2. above) ensures continuous operation of the camera and prevents the need to replace the PoE midspan itself.

4. Utilize shielded transmission lines

Best practice is to use shielded cables, shielded receptacles and dedicated shield to ground protection in the SPD to harden the signal line, helping to eliminate interruption. Ethernet cables without proper shielding potentially allow a surge event to be transmitted along or in the cable.

5. Future proof the system

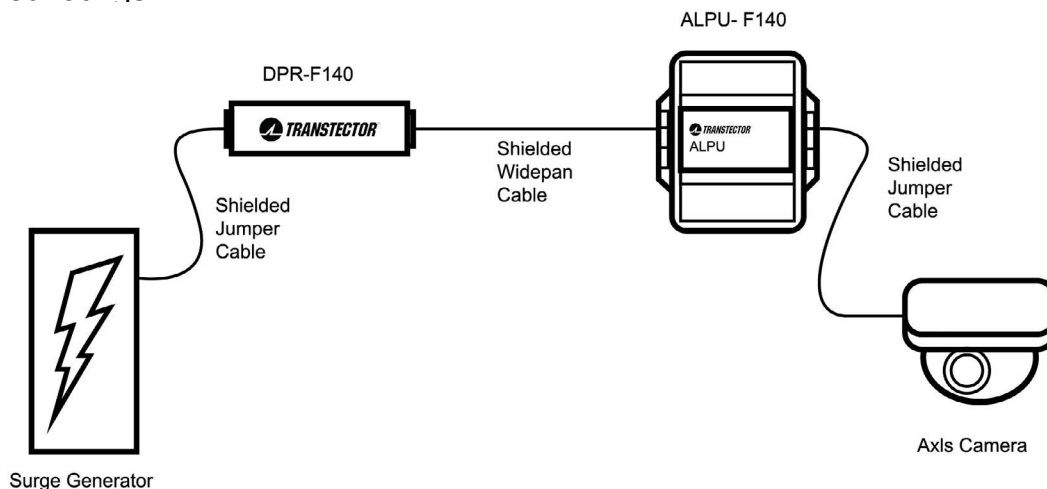
Using gigabit ethernet/PoE++ SPDs, such as the Transtector ALPU-F140, ALPU-PTP-M and DPR-F140 allow the protection infrastructure to remain in place if the PoE-fed equipment must be replaced or upgraded.

6. Utilize NEMA rated enclosures for outdoor applications

In many PoE camera applications, hardware components including surge protection may require mounting for convenience or safety/security concerns. For outdoor applications where hardware may be exposed to harsh environments, it is critical that a NEMA rated enclosure is utilized to protect the equipment from harsh environments. NEMA enclosures are available in a variety of material types, sizes and configurable options including IP67 requirements.

7. Utilize proven compatible components to ensure performance

Turnkey installation can provide efficient and reliable performance of the PoE camera if known compatible components are utilized. Transtector has a full turnkey solution from the camera to the power source, with all the necessary accessories needed for proper installation. The Transtector solution is camera agnostic and can be used with a variety of camera brands. Transtector has undergone rigorous lab testing to ensure the integrity of the SPDs including conditions above the specified ratings.



The Transtector PoE solution was lab tested using a surge generator, shielded mid-span cable, surveillance camera, and (2) Transtector hybrid design data SPDs (DPR-F140) and (ALPU-F140), the diagram below reflects the test configuration. Using the surge generator, the camera was hit with (18) 1KA surge events. After the test conditions were applied, the camera produced crystal-clear images, which proved operational status after multiple surge hits.

To learn more about the need for high performance surge protection for PoE cameras, download our full white paper [here](#).

For more information on Transtector products and solutions, contact us at +1 (208) 635-6400 or visit transtector.com.