

Infinova[®]
The Integrator's Manufacturer



White Paper

How to Protect Video Surveillance Systems against Lightning Strikes

A step by step guide for Security Managers and operations staff to protect their video surveillance systems against the catastrophic consequences of lightning strikes.

Video surveillance systems are very sensitive to high voltages and because of this a lightning strike can cause irreparable damage not only to outdoor cameras, but data transmission equipment as well. A typical surveillance system is divided in three parts:

- Cameras (outdoor)
- Transmission
- Control

The control equipment is normally indoors (including indoor cameras) and is less likely

to be struck by lightning because it is protected by the building. The outdoor cameras and transmission equipment, the most important parts of a surveillance system, are at much greater risk from lightning. Once these devices are damaged the whole surveillance system would not work properly and if they are spread across a wide area, the cost for repair can be significant.



This type of catastrophic failure and the associated costs are avoidable by providing proper protection for all parts of the surveillance against lightning strikes. This white paper provides guidelines for security managers and their operations staff to protect their outdoor cameras and transmission equipment from lightning strikes.

Three Types of Lightning

Direct Strikes: a straight hit on the camera and or the cable in the open air usually causing serious damage as a result of a high current (not voltage). In this situation lightning always strikes the highest point. Lightning conductors work because they are placed at the highest point and draw the lightning away from the equipment.

Lightning Induction: Responsible for more than 80% of lightning damage to surveillance equipment, induction lightning (secondary lightning) affects objects that are near the point of a lightning strike, but are not struck directly. When lightning strikes an object a powerful, transient electromagnetic field is generated around the object, this induces high currents in nearby surveillance equipment and cables and causes serious damage.

Earth Potential Strike: As lightning is grounded, the area surrounding the grounding point is subjected to a very high transient voltage. Surveillance equipment placed close to the ground connector of a lightning conductor is at serious risk of damage from the earth potential of a strike.

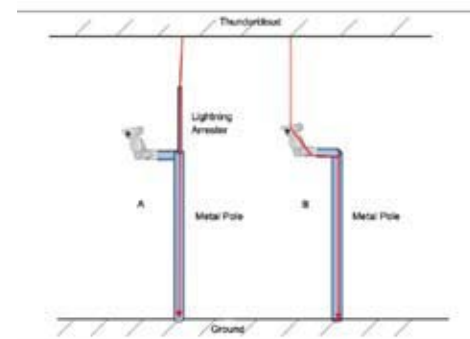
Protecting Equipment from Direct Lightning

Cameras, especially pole mounted cameras and equipment should be protected by a properly grounded lightning conductor. The lightning conductor must be the highest point so that it attracts the strike away from the cameras and equipment. The grounding line should be an 8mm diameter steel wire, or the pole itself in the case of a pole mounted camera. Cameras mounted on buildings that have lightning conductors may not need an additional lightning conductor.

Inside the pole the video cable and power cable must be protected by metal conduit that is grounded securely. This reduces electromagnetic interference in the video signal when the pole induces lightning current. Transmission cables should be housed in metal conduit, not in open air, and buried in the ground. Both ends of the metal conduit must be securely grounded.

Protecting Equipment from Lightning Induction

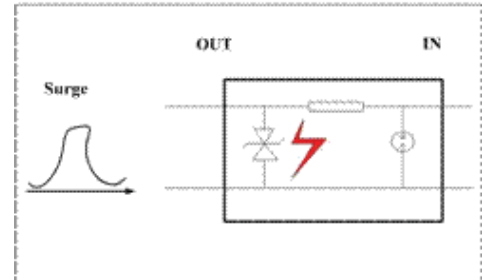
A 3-in-1 video lightning protector for power, video and data is the best protection against damage from lightning induction.



Currents induced in the metallic cables (pigtail) from a camera can seriously damage both the camera and the transmission equipment (fiber optic modem) connected at the end of the cables.

Most video lightning protectors on the market today provide two levels of protection:

- Level 1 - course protection, using gas discharge tube
- Level 2 - fine protection, using TVS diode as protector

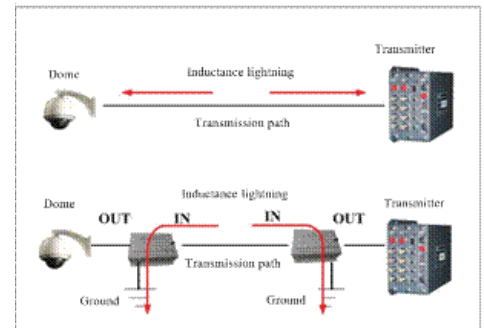


Lightning protectors are installed at each end of the open cable. They have an in- and out-port and must be connected the right way round, in-port (surge) towards the open cable, out-port (protected) towards the equipment. If it is connected incorrectly and lightning strikes it will damage the TVS diode and will not provide protection any longer. The earth end of the lightning protector must be grounded correctly and its earth resistance should be not more than 4ohm.

For maximum protection the lightning protector and the equipment should be as close as possible, there should never be more than 10m distance between the protector and the equipment. The protector's earth cable should not be more than 0.5m long and must be properly grounded.

Good Ground Connection is Always Essential

Finally, the performance of all lightning protection, lightning conductors and 3-in-1 induction protectors comes down to quality grounding with a resistance less than 4ohms. This gives the lightning protection device the best chance to lead the lightning thunder current to ground immediately. It is not possible to prevent equipment from being struck by lightning, but with good preparation and equipment, chances of a strike and the resulting damage can be significantly reduced.



Infinova[®] The Integrator's Manufacturer

By helping channel partners provide their customers with complete, affordable, best-in-class, large and small video surveillance solutions, Infinova helps integrators generate more business more profitably. Leveraging a manufacturing process certified to ISO 9001:2000 standards and over 250 engineers with a list of video industry firsts, Infinova channel partners provide their end-users with industry-acknowledged product reliability and technical leadership.

So that Infinova channel partners can create complete solutions, Infinova provides IP surveillance cameras and components, CCTV analog cameras, DVRs and components, camera accessories, monitors, power supplies and fiber optics communications devices. Infinova also has the technical ability and manufacturing flexibility to let integrators propose customized solutions. In addition, Infinova will partner with other manufacturers making other surveillance equipment and software to help its channel partners create turnkey solutions. Contrary to most other companies, Infinova will back-up their partners' products as well as its own to assure both the integrator and its customers that one call – to Infinova only – takes care of everything.

Infinova works diligently to assure its channel partners can provide cost-conscious solutions. With Infinova's hybrid systems, channel partners can propose systems that protect a customer's investment in its already-installed analog surveillance system but that also put them on a dynamic migration pathway to IP systems.

Infinova is lauded for its exceptional maintenance programs. A major highlight is the company's 24-hour advanced replacement policy in which a substitute product is shipped immediately upon notice of a problem.

With such customer focus, Infinova is often referred to as "the integrators' manufacturer."

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