

## Protect your IP Video Surveillance Systems from summer storms

Marc van Jaarsveldt, consultant, The Surveillance Factory, a video surveillance system-integrator, says that the majority of all surge-induced damage to IP video cameras and equipment is caused by surges travelling along unprotected data and power lines. He says these surges originate from static charge build-up, lightning and mains (AC) generation systems, and if left unprotected, data and power lines can expose cameras and other equipment to damaging electrical transients.

"All IP-based video surveillance equipment is susceptible to surge damage. Generally, a UTP surge protector is used to protect data lines from induced surges. There are several aspects to consider that will assist in protecting your equipment from surge damage," says van Jaarsveldt.

There are three important aspects to consider when aiming to reduce surge impact:

- Typically, indoor points where the UTP route is covered or surrounded by metal building structures, won't need protection. Often the structure and metal components used (e.g roofing, beams, rebar) offer sufficient shielding to negate the requirement for surge arrestors. However, the risk does depend on the type of structure, and the routing that the cable takes. In all cases a surge risk-assessment is needed and the Surveillance Factory will advise if the risk is significant.
- Local earth bonding is critical; surge arrestors only work if the surge energy can be "shunted" (conducted) to earth. This bonding to earth requires the use of copper earth spikes or local earthing at the camera points onto a suitable metal surface. Bonding to local earth on the electrical-mains is acceptable in some cases but needs to be done with caution in case the remote earth point is at different potential to the local or home earth. This can create earth loops, where current flows between earth points, cause further harm.
- Equipment cannot be isolated from severe strikes even if protection equipment is used; direct lightning strikes can induce over-voltages sufficient in magnitude to destroy surge protection equipment and damage the camera equipment beyond it.

Overloaded or inadequate power generation and distribution systems can result in voltage surges on power lines. "The reality is that 220V power sources present a risk to equipment. Camera systems make use of 220V AC power supplies and where cameras are powered by Power over Ethernet (POE), an effective method of surge protection is needed," says van Jaarsveldt. He offers the following additional recommendations:

- One should assess the lightning risk for each camera point and decide whether surge protection equipment is needed. Because of the nature of lightning and surges, guaranteed protection is impossible.
- Ensure risky camera points are protected using Class 3 UTP surge arrestors.
- Wherever possible use single phase Class 3 mains appliance protectors where 220V points are needed for the server/switch/cameras.
- Protect the mains supply (220V AC) using surge protection on the distribution board (DB) if needed.

There are basic assumptions made according to van Jaarsveldt. Make sure these are covered before you consider moving forward with any other surge protection: "When looking at your primary mains protection ensure that the mains power obtained from the distribution board is suitably protected. This implies that a Class 1 or 2 style surge

protector is already installed.”

He says that the frequency of surges due to lightning is related to geographic location. Higher areas such as the Highveld, are more prone to the effects of lightning from thunderstorms than lower areas such as the coastal regions. “You can decide not to use protection equipment if you feel that the cost vs. risk benefit is not compelling,” says van Jaarsveldt.

It's worth remembering that smaller, low cost UPSs provide little surge suppression and van Jaarsveldt says that users cannot assume that UPS conditioned power is protected from surges “In general, line-interactive UPSs, which are low cost, are not able to provide much immunity to equipment, making an online UPS a better choice.”

Surge protection equipment is categorised according to the magnitude of the voltage surge anticipated. Class 3 equipment offers basic protection for the lowest case of over-voltage and is sufficient for protecting camera systems. “The trade-off of surge-immunity against protection-device cost is significant and as a result, we do not make use of Class 1/2 equipment because over-specifying these devices leads to excessive cost. In addition, the availability of suitable Class 1/2 surge arrestors that work with UTP and UTP/POE is limited locally,” says van Jaarsveldt.