Surge Protection for Surveillance Systems

Protect the System that is Protecting You...

EMERSON
Network Power
Introduction to Surge Protection
Our Comprehensive Surge Protection Plan–For Your Surveillance System

Our Approach

Typical Applications (Illustrated)
Small Businesses – SURGEHOTSpots
Large Businesses/Campus Environment – SURGEHOTSpots

Surge Protection Selection Guide For:
Surveillance Cameras, (Network, Analog, PTZ)
Head-End Equipment, (DVR, NVR, Switch)
AC Power, (Electrical Service Panel, Rooftop HVAC, Exterior Lighting)

Surge Protection Installation Diagrams
Analog, Network

Surge Protection Product Descriptions
Edco FAS Series, Edco CP-24 Series, Edco CCTV-1, Edco CX06 Series
Edco PC-642C, Edco HVCP-48-BNC, Edco CAT6-POE-I
Why Should I Install Surge Protection On My CCTV System?

Damage Due To Transients and Surges
Today’s advanced surveillance systems are more critical than ever before. Monitoring for public safety, traffic, property loss and crime prevention has become an integral part of today’s society. The equipment used has become increasingly sophisticated and specialized to meet the requirements of its application. These requirements have created a wide variety of cameras and accessories, each a vital link in the overall system. Sensitive components within this system are located in areas that are highly susceptible to transients and surges. These disturbances can be induced on any power, video or data line, often disrupting a signal or even disabling equipment. Any failure within that system can prevent capturing and recording of critical information, leaving you at risk.

IEEE Recommendations
Numerous standards exist that caution end users of potential issues associated with transient activity and their low voltage signals, including the IEEE Emerald Book, which specifically states in 4.6.5.1 that; “Signal-carrying circuits are susceptible to surge interference via conduction, inductive and capacitive coupling...” They go on to recommend protecting both the power and signal lines in 8.6.6; “Electronic equipment containing both AC power and data cabling should also be properly protected via surge protective devices on both the AC power and data cables.” Other guides such as UL Master Label 96A, the National Electric Code (section 800) and the NFPA, set forth criteria to ensure the integrity of voice, data, and communication systems critical to the safe operation of the facility.

Dual Protection Benefits
- The benefits of a surveillance system are clear. Monitoring and capturing workflow, potential liability actions and criminal activity should be viewed as a 24/7, 365 day-a-year commitment.
- Taking the extra step to ensure the operation of your system requires a coordinated surge protection plan that identifies susceptible “SURGEHOTSpots” within that system.

Our Approach
Emerson Network Power has developed a series of products to specifically address these potential “SURGEHOTSpots”. Whether your system is an established analog, fixed, high-definition network or some combination of both, we have a solution.

“Taking the extra step to ensure the operation of your system requires a coordinated surge protection plan that identifies susceptible “SURGEHOTSpots” within that system.”
Surge protection is a smart investment in preventing not only equipment loss, but the potential loss of critical information... possibly the surveillance video itself. Emerson Network Power recommends the following:

1. **Install surge protection devices on all components connected to wiring entering or exiting a building.**
   As detailed in the diagram below, a typical surveillance system is directly or indirectly connected to a building’s main electrical service panel. AC power, data lines and coaxial cables...are all vulnerable to surges and transients. A single surge event affecting exterior equipment, *(like cameras)*, can follow a path leading back into a building, affecting interior equipment as well. DVRs, *interior cameras, midspans and power supplies* may not have received the initial surge, but because these components are connected, the entire system is at risk of damage or even destruction.

2. **Install surge protection devices directly on the electrical service panel, along with each individual piece of equipment (both interior and exterior).**
   The risk of damage from a surge event isn’t limited to only the interior and exterior video surveillance equipment... loads, such as HVAC units, lighting and signage can be affected by a surge event occurring elsewhere.
“It takes a variety of surge protective products to protect your mission-critical equipment. Emerson Network Power’s comprehensive product portfolio ensures you’ll be able to provide peace-of-mind surge protection at all “SURGEHOTSpots” within the security system.”

Peace-of-Mind Surge Protection

**AC Power**

Protect with a UL 1449, Type 1 Surge Protective Device, (SPD). Installing AC surge protection as a first line of defense ensures that all panels and equipment connected to the system will not act as a conduit for transient impulses to disrupt or damage downstream components.

**DC Power**

Installing surge protection directly at your equipment ensures that your devices are isolated from impulses that may be induced on exposed, long wire runs.

**Coaxial**

Protect with a UL 497 approved SPD. Installing coaxial based surge protection directly at your equipment ensures your devices are isolated from impulses that may be induced on exposed, long cable runs. For complete protection, install a device at both the camera and head-end of the system.

**Data**

Protect with a UL 497 approved SPD. Installing a surge protective device to protect your RS-485 data lines is critical. Data can be disrupted via surge impulses or sneak currents at impulse levels of less than 10 volts. For complete protection, install a device at both the PTZ camera and head-end of the system.

**Ethernet**

Protect your Category 5 or 6 ethernet lines and POE devices with a properly sized SPD. Long cable runs to exposed locations can provide a direct path for induced transients to disrupt devices and may provide a conduit for transients to enter your network.

**Rackmount (Head-End)**

Protect multiple AC, Coax and POE connections within your camera/network rack. Interactions with AC power panels, long, exposed cable runs and access to your business network switches, makes this one of the most vulnerable and critical “SURGEHOTSpots” within your surveillance system.
Rooftop HVAC
Rooftop HVAC systems are a critical component in keeping your business “up and running”. Electronics can overheat in minutes, and a failure here may not only impact electronic transactions, but compromise your system’s ability to record events.

Camera Head-End
The equipment rack is a landing point for DC, AC, video and data inside your facility. Information may be stored or transmitted to the network from this location, therefore proper protection at all points is required.

Exterior Cameras (Analog)
High exposure installations and wire routing make any externally mounted camera extremely susceptible to transient and surge events.

Exterior Lighting and Signage
Parking lot and exterior lighting are susceptible to lightning transients, which puts the electronics within the fixture at risk as well as provides a direct path for the transient to enter the facility’s electrical system.

Exterior/Parking Lot Lighting

Service Entrance/AC Power
The utility room may be the first point of access for surges. In a small business, utility power, HVAC units and parking lot lighting may be tied directly into a single service panel. These locations may act as a conduit for transients to enter your electrical system; the same “system” that provides power for (video recording equipment).

Exterior/Parking Lot Lighting

Surge HOT Spots™
Exterior Lighting and Signage
Parking lot and exterior lighting are susceptible to lightning transients, which puts the electronics within the fixture at risk as well as provides a direct path for the transient to enter the facility’s electrical system.

Exterior Cameras (Analog)
High exposure installations and wire routing make any externally mounted camera extremely susceptible to transient and surge events.

PTZ (Pan/Tilt/Zoom) Camera

Fixed Camera

Camera Head-End
The equipment rack is a landing point for DC, AC, video and data inside your facility. Information may be stored or transmitted to the network from this location, therefore proper protection at all points is required.

Rooftop HVAC Systems
Rooftop HVAC systems are a critical component in keeping your business “up and running”. Electronics can overheat in minutes, and a failure here may not only impact electronic transactions, but compromise your system’s ability to record events.

Interior Cameras (Analog)
Interior surveillance is one of the most “mission-critical” areas for any business. Cameras need to be fully operational at all times. Interior and exterior cameras are often electrically connected and share the same ground potential – a surge event outside can adversely affect equipment on the inside.

Interior Surveillance

Small Business
Typical Applications Requiring Surge Protection
Large Businesses/Campus Environment

Typical Applications Requiring Surge Protection

"A campus environment creates a unique protection challenge... IEEE Emerald book recommends: "...a listed and properly rated surge protective device should be applied to each individual or set of electrical conductors (e.g., power, voice, and data) penetrating any of the six sides forming a structure."

IT/Network Services
There are potentially hundreds of cameras mounted externally in a campus environment with extremely long cable runs and attached (exposed) accessories. Protection for power, data and video should be applied at each camera and accessory connection along the way.

Exterior Cameras (Network)
There are potentially hundreds of cameras mounted externally in a campus environment with extremely long cable runs and attached (exposed) accessories. Protection for power, data and video should be applied at each camera and accessory connection along the way.

Exterior Lighting
Parking lot and exterior lighting need to be operational at all times. Lightning transients put the electronics within the fixture at risk. Additionally, it provides a direct path for the transient to enter the facility’s electrical system.

Rooftop HVAC
All exterior mechanical systems that are in an area not effectively protected by a lightning protection system should be considered targets. Therefore, it’s recommended practice to individually provide surge protection on both the equipment and the panel board feeding the equipment.

Video Monitors and Accessories
Video may be monitored in multiple locations and tied back to a central area rack area for recording and storage. Each location requires a coordinated AC, DC, video and data protection plan.

Electrical Service Panel
Each building in a campus setting may contain its own service panel with its utility power potentially fed from a variety of sources. In any case, this system gets complex and ultimately compromised due to ground potential differences and exposed conductors. Cascaded surge protection is required at each panel.

Fixed Camera
Interior cameras may be powered by a variety of sources; a supply cabinet, PoE. Each camera should be protected by a properly sized surge protective device at both the camera and head-end.
### Surge Protection Selection Guide

**NETWORK CAMERAS**

<table>
<thead>
<tr>
<th>Dome</th>
<th>Dome (back)</th>
<th>Box</th>
<th>Box (back)</th>
</tr>
</thead>
</table>

**ANALOG CAMERAS**

<table>
<thead>
<tr>
<th>Dome</th>
<th>Dome (back)</th>
<th>Box</th>
<th>Box (back)</th>
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</thead>
</table>

**PTZ CAMERAS**

<table>
<thead>
<tr>
<th>PTZ (front)</th>
<th>PTZ Connector</th>
</tr>
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</table>

### Recommended Surge Protection Product

<table>
<thead>
<tr>
<th>Power</th>
<th>Video</th>
<th>Data</th>
<th>Combination Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edco CCTV-1 (Interior)</td>
<td>Edco FAS-1</td>
<td>Edco CX-06-MI (Exterior)</td>
<td>Edco CAT6-POE-1</td>
</tr>
<tr>
<td>Edco CCTV-1 (Interior)</td>
<td>N/A</td>
<td>Edco FAS-1 (Exterior)</td>
<td>Edco HVCP-48-BNC</td>
</tr>
</tbody>
</table>

Product descriptions are located on pages 14-16.
Surge Protection Selection Guide

AC Power

ELECTRICAL SERVICE PANEL

RECOMMENDED SURGE PROTECTION PRODUCT

POWER

560 Series
(For 800 Amps and Above)

420 Series

ROOFTOP HVAC

RECOMMENDED SURGE PROTECTION PRODUCT

POWER

420 Series

EXTERIOR LIGHTING

RECOMMENDED SURGE PROTECTION PRODUCT

POWER

Edco SHAS Series

Product descriptions are located on pages 14-16
**Surge Protection Product Descriptions**

**CAMERA POWER**

<table>
<thead>
<tr>
<th>Edco FAS Series</th>
<th>Edco CP-24 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Select Edco FAS-1-043 HC to protect power to the camera</strong></td>
<td><strong>Select Edco CP-24 to protect power to the camera</strong></td>
</tr>
<tr>
<td>The Edco FAS-1 Series is a Multi-stage, single-pair surge suppressor, designed for high exposure camera locations and is ideal for protecting “twisted pair” power to your camera.</td>
<td>Ideal for protecting the DC power input to your security camera. The Edco CP-24 is a quick snap installation for power applications up to 24 VDC. For complete protection add the Edco CCTV-1 to the video input.</td>
</tr>
<tr>
<td>Technical Summary</td>
<td>Technical Summary</td>
</tr>
<tr>
<td>Peak Surge Current ................................................. 10 kA</td>
<td>Peak Pulse Power ................................................. 1500W</td>
</tr>
<tr>
<td>Operating Current .................................................... 2.5 A</td>
<td>Operating Current ................................................... .5A</td>
</tr>
<tr>
<td>SPD Technology ......................................................... GDT, SAD, w/Series Inductor</td>
<td>SPD Technology ....................................................... SAD</td>
</tr>
<tr>
<td>Connection Type ....................................................... Terminal block w/compression lugs (Terminals accept up to 12 AWG)</td>
<td>Connection Type ..................................................... 2.1mm Camera Power Jack</td>
</tr>
<tr>
<td>Certifications ........................................................ .......................... UL 497B</td>
<td>*Optional Combination Package ................ Edco CP-24/Edco CCTV-1</td>
</tr>
<tr>
<td>“Optional Combination Package ........ Edco FAS-1-043 HC/CX-06-MI Order P/N: FAS-CXMI</td>
<td>Order P/N: CP-CCTV</td>
</tr>
</tbody>
</table>

**VIDEO**

<table>
<thead>
<tr>
<th>Edco CX06 Series</th>
<th>Edco CCTV-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Select Edco CX-06-MI for an isolated ground to the camera</strong></td>
<td><strong>Select Edco CCTV-1 to protect the video input to the security camera</strong></td>
</tr>
<tr>
<td>The Edco CX06 Series implements a three-stage hybrid technology; offering high energy surge handling capability directly at your camera. This product is ideally suited for protecting your video signal in high exposure applications.</td>
<td>The Edco CCTV-1 application is specifically designed for protecting closed circuit TV systems. The protector is easily installed directly at the camera’s BNC video output.</td>
</tr>
<tr>
<td>Technical Summary</td>
<td>Technical Summary</td>
</tr>
<tr>
<td>Peak Surge Current ................................................. 20 kA</td>
<td>Peak Surge Current ................................................... 10 kA</td>
</tr>
<tr>
<td>Operating Current .................................................... 0.15 A</td>
<td>Operating Current ................................................... 10 kA (8 x 20 μs)</td>
</tr>
<tr>
<td>Operating Voltage ..................................................... 5 VDC</td>
<td>Operating Voltage ..................................................... 5 VDC</td>
</tr>
<tr>
<td>SPD Technology ......................................................... GDT, SAD, w/Series PTC</td>
<td>Frequency Range ....................................................... 0 to 1 GHz</td>
</tr>
<tr>
<td>Connection Type ....................................................... BNC, 50/75 Ohm</td>
<td>SPD Technology ....................................................... Gas Discharge Tube (GDT)</td>
</tr>
<tr>
<td>Certifications ........................................................ .......................... UL 497B Listed</td>
<td>Connection Type ..................................................... BNC, 75 Ohms</td>
</tr>
<tr>
<td>“Optional Combination Package ........ Edco CX-06-MI/FAS-1-043 HC Order P/N: FAS-CXMI</td>
<td>*Optional Combination Package ........ Edco CCTV-1/Edco CP-24</td>
</tr>
<tr>
<td>Order P/N: FAS-CXMI</td>
<td>Order P/N: CP-CCTV</td>
</tr>
</tbody>
</table>
Select Edco PC642C-008LC and Edco PCB1B (base) to protect your data port

The Edco PC642C-008LC surge suppressor is a four-wire module implementing three-stage hybrid technology with resettable fuses, specifically designed for RS-485 and RS-422 applications.

Technical Summary
- **Peak Surge Current**: 10 kA
- **Operating Voltage**: 5 VDC
- **Operating Current**: 0.15 A
- **SPD Technology**: GDT, SAD, w/ Series PTC
- **Connection Type**: Terminal block w/compression lugs
  - Terminals accept up to 10 AWG
- **Certifications**: UL 497B Listed

*Optional Combination Package ........ Edco PC642C-008LC/PCB1B

Select the Edco HVCP-48-BNC for DC power, data and video protection all-in-one package

The Edco HVCP-48-BNC is a hybrid surge protection product. Each separate circuit is capable of handling high-current impulses while tightly clamping transients and allowing critical power and data to be transmitted.

Technical Summary
- **DC Total Peak Surge Current Rating**: 10kA
- **DC Power Operating Voltage**: 48 VDC
- **DC Power Operating Current**: 1 Amp
- **Data Clamping Voltage**: 15 VDC
- **Data Peak Surge Current Rating**: 10kA
- **Video Clamping Voltage**: 2 VDC
- **Video Peak Surge Current Rating**: 20kA
- **Certifications**: UL 497B Listed, Tested to IEC 802.11
  - *Optional NEMA 4X Enclosure
  - Order P/N: HVCP-48-BNC-4X

Select the Edco CAT6-POE-I for isolated ground protection at the camera end

The Edco CAT6-POE Series is designed to work on Category 6 Power-Over-Ethernet transmission line applications and is ideal for protecting POE cameras. For optimum protection use the Edco CAT6-POE-I at the camera end.

Technical Summary
- **Operating Voltage**: 5 VDC
- **Operating Voltage**: 48 VDC
- **Operating Current**: 0.75 Amps per Pin Continuous
- **Peak Surge Current**: 10kA
- **Transmission Speeds**: 10BaseT; 100BaseT; 1000BaseT
- **SPD Technology**: GDT; PTC; SAD
- **Certifications**: UL 497B Listed, Tested to IEC 802.11
  - (Complies to IEEE 802.3AT and 802.3AF)
**HEAD-END RACKMOUNT**

<table>
<thead>
<tr>
<th>Islatrol RM-115-10RM</th>
<th>Edco RM-CX06-16R</th>
<th>Edco RM-CAT6-POE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Select Islatrol RM-115-10RM to protect the AC Power to your head-end equipment</strong></td>
<td><strong>Select Edco RM-CX06-16R to protect the video connection feeding your head-end equipment</strong></td>
<td><strong>Select Edco RM-CAT6-POE to protect network switches and hubs</strong></td>
</tr>
</tbody>
</table>

Islatrol™ RM Series is a series connected filter with surge suppression, designed to provide AC power protection at your rack.

**Technical Summary**
- **Peak Surge Current**: 40 kA
- **Operating Current**: 15 A
- **Operating Voltage**: 120 V
- **SPD Technology**: MOVs, inductor, Capacitor
- **Connection Type**: 5-15 P, (Plug) Qty.12/5-15 R (Receptacles)
- **Status**: Power, Ground and Surge Indicators, Digital Meter
- **Certifications**: UL1449 3rd Edition

The Edco RM-CX06-16R Surge Protective Device (SPD) is a 16-channel coax SPD implementing three-stage hybrid technology.

**Technical Summary**
- **Peak Surge Current**: 20 kA
- **Operating Current**: 0.15 A
- **Operating Voltage**: 5 VDC
- **SPD Technology**: GDT, SAD, w/Series PTC
- **Connection Type**: BNC, 50/75 Ohm
- **Certifications**: UL 497B Listed

**AC POWER**

<table>
<thead>
<tr>
<th>560 Series</th>
<th>420 Series</th>
<th>Edco SHAS Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Select the 560 Series to protect the main service entrance and distribution panels</strong></td>
<td><strong>Install the 420 series at ANY location within the AC power system</strong></td>
<td><strong>Select the Edco SHAS to protect street, parking lot lighting and signage</strong></td>
</tr>
</tbody>
</table>

Premium service entrance surge protector, designed for high-exposure, high-energy applications.

**Technical Summary**
- **Surge Current**: 80 kA-500 kA/mode
- **Operating Voltage**: 120-600V, (All Phase Configurations Available)
- **SCCR**: 200 kAIC
- **SPD Technology**: Modular, MOV/Fuse Arrays, Capacitors
- **Certifications**: UL1449 3rd Edition, Type 1, UL1283, cUL

Compact surge protective device, designed for use on service entrance, distribution panels and HVAC equipment.

**Technical Summary**
- **Surge Current**: 50 kA/mode
- **Operating Voltage**: 120-480V, (All Phase Configurations Available)
- **SCCR**: 200 kAIC
- **SPD Technology**: Non-Modular, MOV Based
- **Certifications**: UL1449 3rd Edition, Type 1, cUL

The Edco SHAS Series is a compact surge protector that is designed to be integrated within your outdoor light fixtures. Ideal for ballast and electronic power supply protection.

**Technical Summary**
- **Surge Current**: 36 kA
- **Operating Voltage**: 120, 240 & 480V
- **SPD Technology**: MOV Based
- **Connection Type**: Wire Lead Series
- **Connected SPD**

For assistance in choosing the proper surge protective devices for your surveillance system application, call us at: 1-800-288-6169 or email us at: surgetech@emerson.com. We’re here to help!
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To order a printed copy, click here.

We’re here to help!

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