



A CONVIRON COMPANY

Lightning

Protecting Your Argus System



Rev. November 2012

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PROTECTING YOUR ARGUS EQUIPMENT

Lightning strikes can be disastrous for any electronic device. A single lightning bolt can unleash as much energy as a ton of TNT. There is simply no way to fully protect any electrical equipment that sustains a direct hit.

Fortunately, the 'blast area' of a lightning strike is very narrow and most control system components except for the weather station are protected inside the building.

However, even when the equipment does not receive a direct hit, a massive surge of electricity can be conducted through connected wiring. If this energy is not safely drained away or blocked before entry, it can build to dangerous levels and cause damage to electronic components.

Your Argus control system uses a multi-level approach for protecting your control equipment from electrical damage. Each component is equipped with built-in protection devices to resist power surges and lightning-related electrical spikes.

Additional stand-alone lightning protection components are available to protect your equipment against lightning surges that could be propagated through the communications wiring. These devices are designed to safely shed power spikes or to physically disconnect the wiring when dangerous currents are detected.



To obtain the maximum benefit of the protection circuitry built in to your Argus system, it is extremely important that the equipment be properly installed as per your Argus wiring diagrams and bonded to a good earth ground system.

The following guidelines must be observed to ensure adequate protection for your system.

GENERAL GUIDELINES

1. Ensure that your facility has the main electrical ground properly connected to a ground rod system. Facilities with many buildings may have more than one grounding point.
2. Follow your Argus wiring diagrams and instructions carefully to properly bond the Argus equipment to a suitable earth ground. Normally this will be the ground system for your electrical system. An electrician can test impedance of the electrical earth ground of your site to ensure that it is adequate.
3. Use good surge protection on powered lines and telephone modems. Direct lightning strikes to power and phone lines can cause power failures, power spikes and fluctuating power.
4. Keep your wire runs *inside* of buildings whenever possible and keep them as short and as low as possible. A direct hit to an outdoor wire run will damage the wire and the control system components connected to it.
5. Long wire runs, such as those on the device or system network, may act as an antenna, picking up large inductive energy surges from nearby lightning strikes causing damage to Argus system components.
6. If your controlled facility is located in a high lightning area, lightning arrestor equipment should be installed to divert or shunt the lightning away from your building and wiring. This will provide protection for all of your electrical equipment as well as your Argus control system.
7. The Argus Weather Station is often the highest point on the greenhouse, making it more susceptible to direct lightning strikes. In addition, it may pick up current from a nearby strike, and conduct high voltages to other system components. Argus provides special arrestor protection equipment for all weather stations.

ARGUS SYSTEM PROTECTION

Argus systems are designed with lightning protection in mind. Built-in lightning and surge protection is provided through the use of varistors, resistors, transorbs, gas discharge tubes, fusing, transformer isolation and grounding.

1. All control boards with communication capabilities have internal lightning protection. Every network connection, input channel, output channel and communication port is designed to resist small power surges and lightning-related electrical spikes.
2. Specially designed NLP (Network Lightning Protection) and NFLP (Network Fused Lightning Protection) modules are available to protect your equipment from lightning induced surges propagated along the communications wiring.
3. ISOTEL power bars are used to protect the PC power supplies and modem connections from power surges and electrical spikes originating in these wires.
4. Argus can install additional lightning protection on the main power supply and on the individual transformers which power the Argus system. This is usually not needed.

CONCLUSIONS

A well designed and properly installed and maintained computer control system can be very resistant to damage caused by lightning. No matter what level of protection you install, there is almost nothing you can do about a direct strike. Luckily, these events are rare.

The extensive protection systems that Argus uses will minimize and localize damage as much as possible.

Avoiding lightning damage boils down to a bit of luck, good system design, and proper installation practices. We usually do not recommend an overly aggressive level of protection for most new customers unless they have a strong history of lightning damage at the site.

The added cost and complexity of additional protection is seldom justified. However, when problems are recognized, a systematic approach to engineering a solution can greatly reduce the chances of subsequent failures.

An Argus Sales representative can assist you in engineering a cost-effective system with the least amount of susceptibility to lightning damage.



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