

# Power Over Ethernet (PoE)

By Tom Elf

PoE is a technology that allows the electrical power necessary for the operation of each end-device to be carried by the data cables rather than by separate power cords. It minimizes the number of cables that must be used and installed, resulting in lower cost, less down time, easier maintenance and greater installation flexibility. Increasingly more end-devices are adopting the standard and PoE is becoming more popular as people realize how simple it is to understand and implement.

Basically, PoE uses standard eight wire CAT5 Ethernet cables to carry the data signal and power. Data is carried over four of the conductors and power is carried over the spare wires. Power is inserted with a device called an "Injector" that injects a DC voltage (typically 48 Vdc) on the CAT5 cable. Basic injectors are essentially power supplies with Ethernet inputs and outputs. They use a standard non-powered CAT5 cable on the input and a standard CAT5 cable carrying data and power on the output. There are a wide variety of injectors available from single port to multi-port units, typically 1, 6, 12 and 24 port units. Injectors are typically installed in central locations where there are multi-port switches or hubs. They may be simple power injectors or they may be combined hubs or switches with integrated injectors.

Network devices that accept the injected power on the CAT5 cable are considered to be "PoE compatible" or "Active Ethernet compatible" devices. Emerson Process Management offers PoE compatible security cameras with our Security Vision solution. Network devices that are not PoE compatible such as access control card readers can still be used in PoE applications with a PoE splitter. Splitters take the combined data and power input, and provide a CAT5 data output and a separate DC voltage output to power the network device. In addition, splitters may be "passive" or "regulated". A passive splitter simply passes the 48 Vdc to the output connection. A regulated splitter converts the 48 Vdc to another voltage, typically 12 Vdc to power the network device.

Although the IEEE 802.3af standard defines basic PoE operation, there is some variation by manufacturer in end network device voltage and CAT5 pinout. Therefore compatibility can't just be taken for granted.

OK, so what's the benefit? There are really two benefits; network security and location flexibility. Both are benefits to security systems and that is why Emerson offers PoE with our Security Vision solution.

- Simple means for resetting network security cameras

Digital cameras are complex devices. Occasionally they may need to be reset due to an electrical storm or other such event. The Midspan multi-point injectors Emerson offers provide a convenient way to reset camera power from a PC with IP connectivity to the Midspan. In many applications this is a lot more convenient than climbing a pole or roof to reset the camera.

- Cameras may be easily relocated as needed

Most cameras have an AC adapter to power the unit. Changing the camera location no longer requires a new AC installation when PoE is used.

- UPS backup for security

By backing up the PoE Midspan, the entire camera network can continue operation during a power outage.

- Improve network reliability

Line terminal detection enables safe installation without worrying about damage to network devices. A faulty device will be detected and shut down without damaging or shutting down other devices on the network.

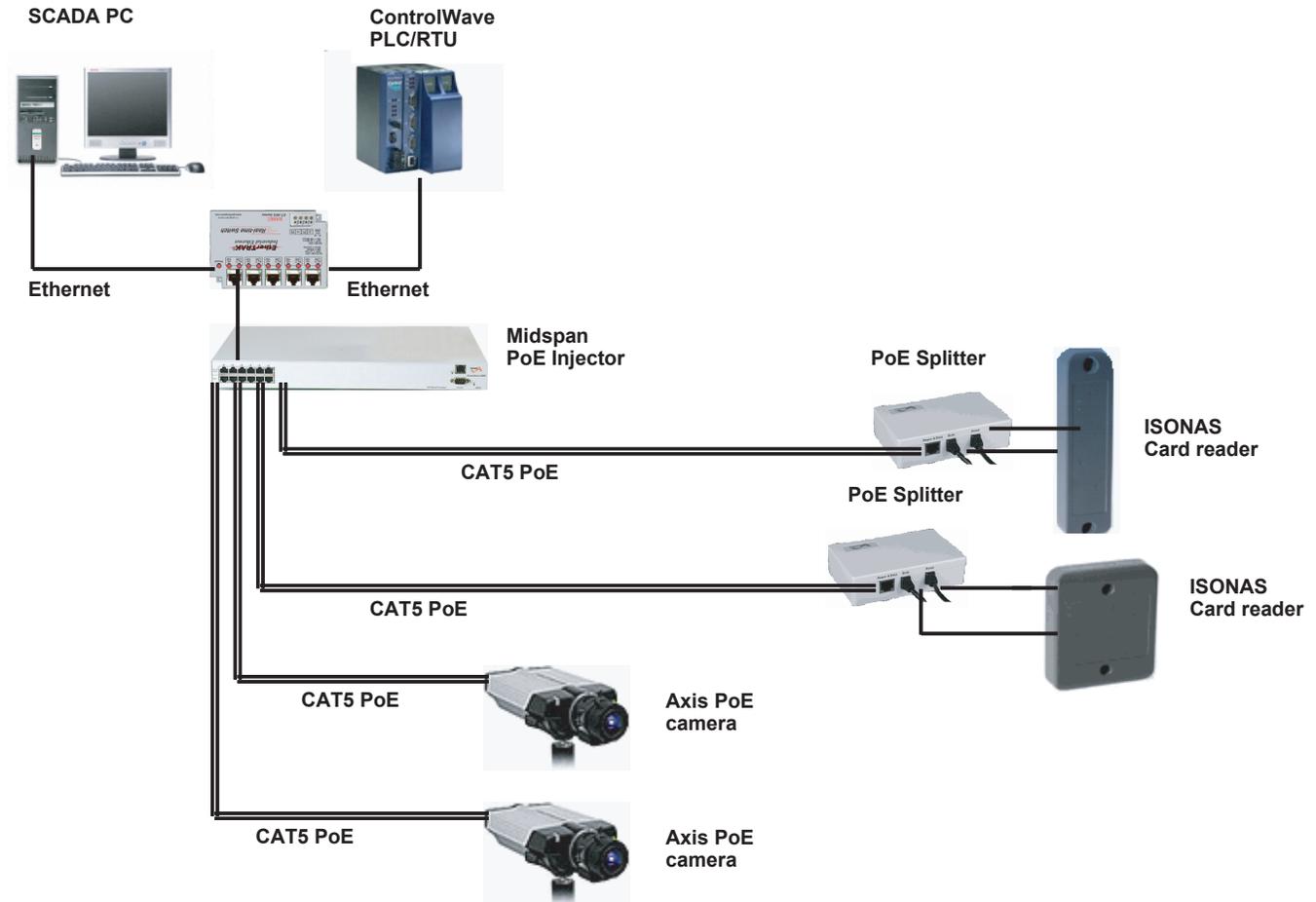
Emerson offers a selection of the most common PoE and security devices. The drawing below shows how these devices are integrated into a PoE based network.

# Application Data Document

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## Emerson Process Management Remote Automation Solutions

Watertown, CT 06795 USA  
Mississauga, ON 06795 Canada  
Worcester WR3 8YB UK

T 1 (860) 945-2200  
T 1 (905) 362-0880  
T 44 (1) 905-856950

Website: [www.EmersonProcess.com/Remote](http://www.EmersonProcess.com/Remote)

