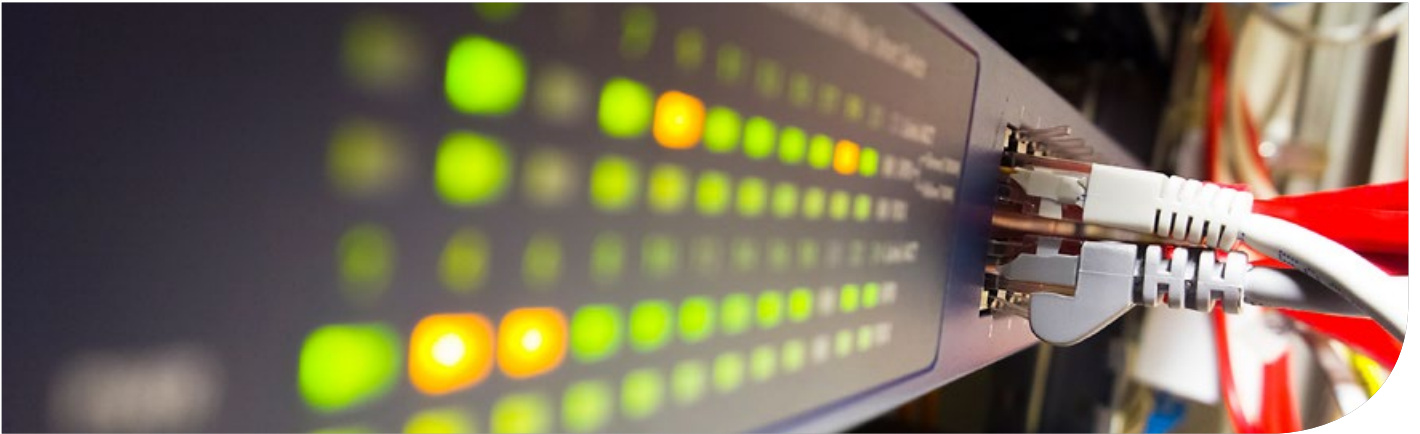# PoE Classification

What it means and why device specifications still matter

What is PoE?

Power over Ethernet (PoE) is the term used when the ethernet cable to an electrical device is also used to power that device through Power Sourcing Equipment (PSE). Sourcing power in this way is often preferable for surveillance cameras as it means physical camera placement is not restricted by the need for direct, localized power supply.

In the case of PoE enabled surveillance cameras, the PSE is typically a PoE switch that 'communicates' with the camera to automatically identify power requirements i.e. how much wattage is required by the individual device. A PoE switch will not deliver power to a device that is not enabled as it does not know how much power to deliver and therefore could damage it.

What is PoE Classification?

Any device capable of being powered this way will have a PoE classification (see table).

These are globally recognized parameters which specify the maximum wattage range a device could need, and the minimum power output a PSE device needs to produce in order to meet that requirement (the latter is higher to allow for power loss in transmission over cable length).

Most surveillance cameras have a power requirement of over 7W and are therefore at least Class 3. PTZ cameras are typically at least Class 4 because moving the pan and tilt part of the camera require more power. It is important to recognize that a camera's PoE classification may have to take into account additional options that might be available, such as IR LED's, even if they are not present on the actual camera unit installed.

Class	Usage of Class	Maximum Power Levels Output at the PSE	Power Range available to Powered Device	Class Description
0	Default	15.4W	0.44 to 12.95W	Classification Unimplemented
1	Optional	4.0W	0.44 to 3.84W	Very Low Power
2	Optional	7.0W	3.84 to 6.49W	Low Power
3	Optional	15.4W	6.49 to 12.95W	Mid Power
4	Reserved in 802.3af	Treat as Class 0	0.44 to 12.95W	Classification Unimplemented
4	Reserved in 802.3at	30W	12.95W to 25.5W	High Power

SYNECTICS

Understanding Maximum Range

Classification is done as a maximum range e.g. Class 0 = 0.44 to 12.95W. This means that even if a camera does not need the maximum power specified by its PoE classification all the time, the PoE switch has to ensure the full amount, in this case 12.95W is available if needed.

'Unused power' cannot be reallocated to another more power hungry device on the same switch unless this is done manually using a fully managed switch which is typically more expensive. It is also worth noting that cameras with dual power sourcing i.e. able to switch between direct power and PoE for network failure protection, would still be 'allocated' the maximum wattage they might require even if PoE is never used.

Power + PoE Classification = Best Solution

PoE classification provides an important international mechanism for network specification but because it is based on a 'maximum range' basis, the most effective system design takes into account device power specification and PoE classification. This gives the clearest picture of requirements and capabilities.

SYSTEM DESIGN CONSIDERATION CHECKLIST

How many cameras are required for the system? What types of cameras are required?

What power does each camera need?

Calculate network switch requirements based on number of cameras and PoE classification

Redundancy Failover

Contact Synectics for assistance with surveillance system design requirements to meet your needs at sales@synecticsglobal.com.