PoE Frequently Asked Questions

What is PoE ?

Power over Ethernet or PoE is a cost effective solution which allow both data and power to be provided over an ethernet cable to an endpoint.

Why use PoE ?

There are a number of reason why you would use PoE, but in most cases the overriding reason is cost.

An example of this is: -

It can cost between $100 and $200 to run an ethernet cable to a wireless access point. But it can costs a further $400 to run an electrical conduit to power that access point.

The alternative is to install Power Sourcing Equipment (PSE) called Endspan Equipment into the ethernet switch, or by adding Midspan Power Insertion Equipment after the ethernet switch. This will combine the data and power at the source to be sent through the ethernet cable. The power from the cable can then be extracted at the endpoint with a Powered Device (PD) to operate the access point.

This solution removes the need to run expensive electrical conduit and will cost considerably less than $400.

Is there a PoE Standard ?

Yes, the Institute of Electrical Electronics Engineers (IEEE) 802.3af Task Force has ratified the technology into the Ethernet standard. The IEEE 802.3af standard covers the interoperability of using PoE products and covers the PSE - Endspan or Midspan, the Powered Device (PD) and the cabling requirements. It is endorsed by all network players that power IP-connected devices, such as voice-over-IP (VoIP) phones, wireless LAN (WLAN) access points (APs) and advanced security devices, over the existing Ethernet cabling infrastructure.

How is the power put onto the ethernet cable ?

The power can be added to the ethernet cable if the switch has a built-in power source in the form of PSE is called Endspan Equipment, as shown below -

Switch with built-in PSE

VoIP Phone

Webcam

Wireless
Access Point
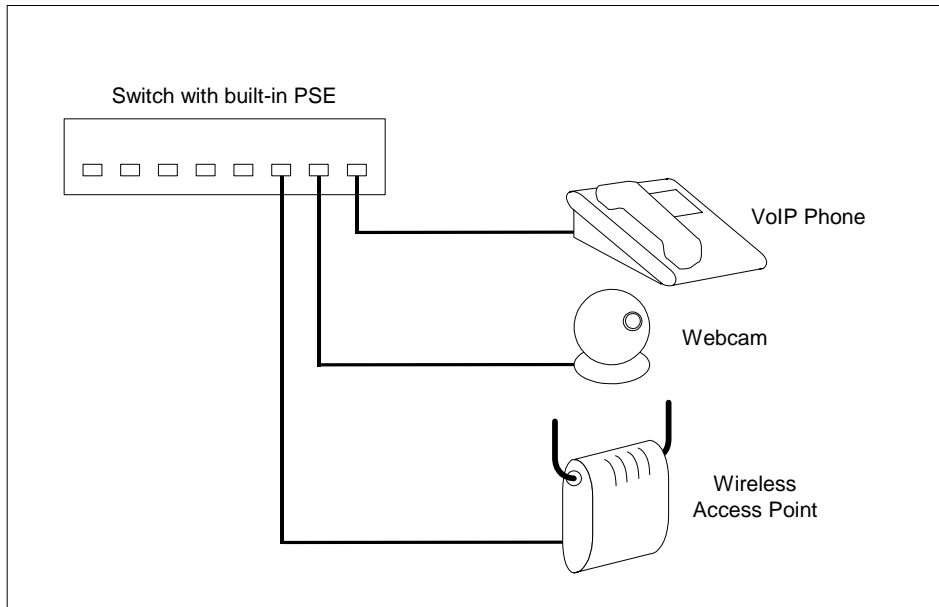
Alternatively the power can be added to the cable after the switch by using a PSE called Midspan Equipment, as show below -

Switch

Patch Cables

Midspan Equipment

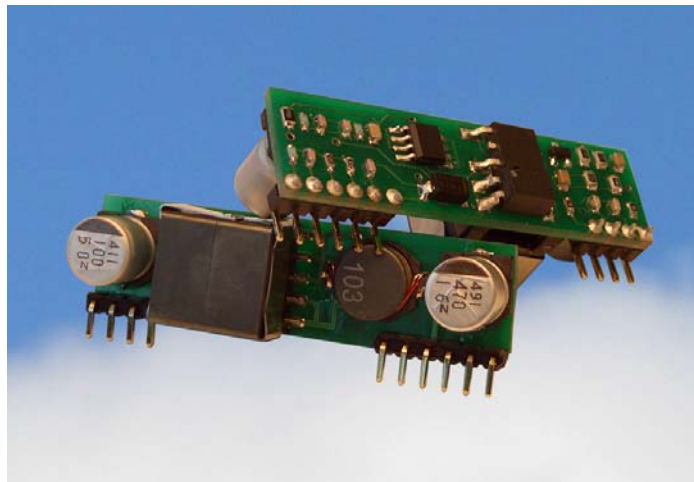VoIP Phone

Webcam

Wireless
Access Point
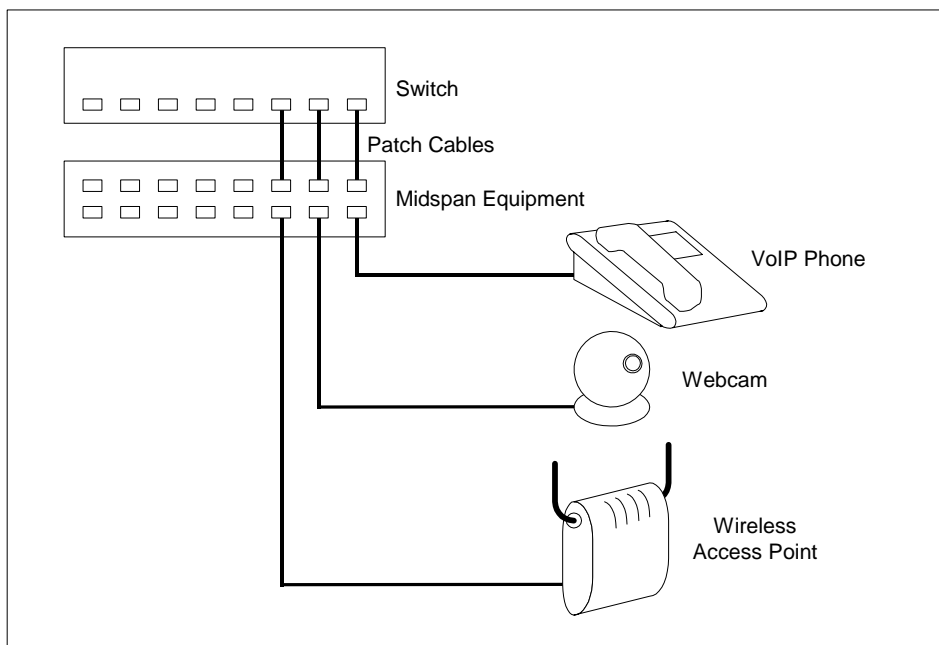
What does the PSE actually supply ?

Under normal operation the PSE supplies a nominal d.c. voltage of 48V, this is limited to a maximum of 15.4 Watts (at the present time).

How is the power extracted from the cable ?

To extract the power from the cable the connected device needs to be a Powered Device (PD) such as the Ag9000.

How does the PSE know that a PD is connected ?

Before the PSE supplies power, it has to verify that the device connected is a Powered Device (PD). It does this by checking that the PD has a conforming signature. The Ag9000 PoE module has a built-in signature chip that does that automatically.

Only upon successful completion of a valid signature will the PSE apply power to the cable. This ensures that non Powered Devices are not damaged by the PSE, thus making the system backwards compatible.

What is Power Class ?

This is optional within the IEEE 802.3af specification, but can be used by the PSE to manage the overall power requirements of the system. Below is a table that shows the various power classes detailed within IEEE 802.3af.

CLASS	Usage	Maximum Power
0	Default	15.4W
1	Optional	4.0W
2	Optional	7.0W
3	Optional	15.4W
4	Reserved for future use	Treat as CLASS 0

The Ag9000 PoE module has the option of setting the power class, if required.

What is Power over LAN?

Basically the Power over LAN or PoL is another term used for Power over Ethernet or PoE.