

VERACITY WHITE PAPER 003:

WHY VERACITY'S POWER PROMISE™ TECHNOLOGY GUARANTEES RELIABLE POE

Summary

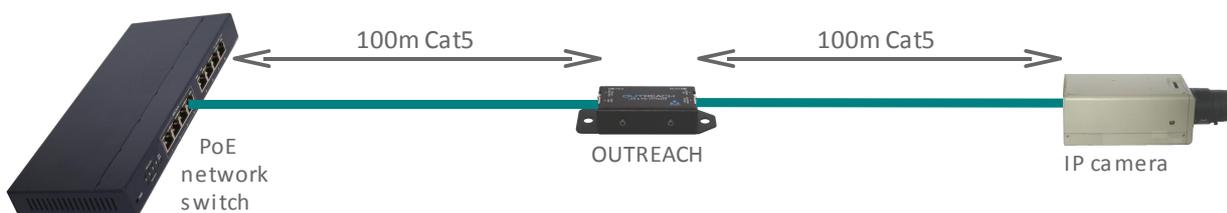
Veracity's OUTREACH™ family of products frees network installers from the distance limitations of conventional Ethernet and Power over Ethernet (PoE). OUTREACH delivers an instant solution for anyone who needs to run Cat5 network connections beyond 100 metres (330 feet), requiring no set-up or configuration, and with the peace of mind of guaranteed PoE performance.

Only Power Promise makes it possible for OUTREACH to offer this unique capability. Power Promise is a Veracity-developed, patent-pending technology which employs meticulous power management to ensure that PoE can only be enabled to devices if there will be no possibility of any device malfunction or disconnection at any time.

The risk of extending Power over Ethernet beyond 100 metres

Whenever electricity is carried by a cable, some power is lost as heat in the cable (due to the cable's *resistance*), and there will be a corresponding voltage drop across it. The longer the cable, the more power is lost, and the greater the voltage drop.

The PoE standard (IEEE 802.3af) accounts for this when it specifies the power characteristics of compatible equipment, so PoE sources must be capable of delivering sufficient power, and at a high enough voltage, to account for the losses in the network cable. Accordingly, powered devices must operate within a lower range of power and voltage. The allowed losses are based on 100 metres of cable, as this is the specified maximum distance for 10 and 100Base-T Ethernet.



In the application shown above, an IP camera must be located around 200 metres from its power source, a PoE network switch, so an OUTREACH is fitted to restore the data signal and forward power to the camera.

Without Power Promise, the OUTREACH would never intervene to prevent PoE forwarding, so the switch must be capable of delivering not only the power required for the camera and 100 metres of cable, but also the OUTREACH's own power requirements, plus the power lost in the additional 100 metre cable segment. There is clearly a risk that the extra distance would cause the power losses and voltage drop to exceed the limits set by the PoE specification.

The potential effects of this are well-illustrated by the example of a PTZ dome camera, which may function perfectly well on an extended PoE connection at the time of installation and during normal operation, however when an incident occurs, the extra load from the PTZ motors operating at full speed results in a total power requirement beyond the PoE limit. This will cause the PoE switch to cut the power or overload, or the increased voltage drop will cause the camera to cut out or behave erratically. Either way the security system will fail at the time it is needed the most.

The Power Promise solution

With Power Promise, situations such as this would never occur. The technology is capable of detecting the characteristics of all parts of the link, including the PoE source, powered device, cabling and any other OUTREACHes in the chain, and it uses this information to ensure there is no possibility of violating the PoE specification *before* it allows PoE to be forwarded.

As the actual characteristics of PoE switches, cameras, network cables and other components are widely varying and often well within the assumed limits, the majority of installations are safe for PoE to be enabled without modifications, and typically there is enough headroom to accommodate chained connections to 300 metres and beyond. However in any case where PoE forwarding is not safe, a simple LED indicator will instruct the installer to fit an OUTSOURCE injector, which provides a known, higher power and voltage, and makes a guaranteed-reliable connection possible.

Key advantages of Power Promise

- ✓ *Continuous power delivery to the IP camera, wireless AP, or other Powered Device is guaranteed*, as the total power drawn from the PoE network switch or midspan injector will never be higher or lower than that of the PoE specification.
- ✓ *Reliable, predictable performance of the camera is also assured*, as the voltage drop along the overall cable length will never cause the camera to receive a voltage it was not designed for.
- ✓ *Devices can be connected in a chain for extra range* and the power management will still ensure safe operation of the *entire* link.
- ✓ Maximum extended range is based on PoE *power classes*, so that lower-power or non-PoE devices can be located even further away.
- ✓ All detection, measurement and calculation takes *only a few seconds* on connection and is *fully automated*, so users do not have to worry about special design techniques or installation procedures.
- ✓ For the occasions where equipment characteristics or extra distance mean OUTREACH alone cannot forward power, Veracity's OUTSOURCE high-power injectors offer an equally straightforward and rapid solution.

Conclusion

It has been shown that Veracity's unique Power Promise technology can be trusted by installers of network equipment to deliver guaranteed performance and peace of mind, by eliminating the risk of overload or under-voltage in critical PoE applications. It is an essential feature of the OUTREACH range, and continues the theme of innovation and ease of use found in every Veracity product.