

Power-over-Ethernet for Outdoor Node Deployments

Power over Ethernet (PoE) is an excellent choice for outdoor nodes at sites with structured cabling infrastructure. It combines power delivery and network connectivity in a single cable, simplifying installation and enabling remote management.

PoE Standards

Standard	Max Power	Typical Use	Common in
IEEE 802.3af (PoE)	15.4W	IP cameras, VoIP phones	Most infrastructure
IEEE 802.3at (PoE+)	30W	PTZ cameras, APs	Modern switches
IEEE 802.3bt (PoE++)	60-100W	Laptops, high-power APs	Newer switches
Passive PoE (non-standard)	Varies	Low-cost IP cameras, some APs	Ubiquiti older hardware

For mesh nodes, IEEE 802.3af is more than sufficient. Most nodes consume 1-5W.

Maximum Cable Run Distance

PoE follows the Ethernet 100m (328 ft) cable run limit. For outdoor nodes at distances greater than 100m from the PoE switch:

- Use a PoE extender (repeater) at the 100m mark to extend another 100m
- Use fiber optic run (with media converter) for runs over 200m - eliminates lightning coupling between building and node
- Use cellular or WiFi for power-independent remote nodes

Lightning Protection for PoE Runs

An Ethernet cable run to an outdoor node creates a lightning risk - the cable can couple surge energy into your equipment:

- **Ethernet surge protector:** Install a PoE-compatible Ethernet surge protector (Ubiquiti ETH-SP-G2, \$15) at both the building entry and the outdoor node enclosure. This is

essential for any outdoor Ethernet run.

- **Fiber optic break:** Insert a fiber optic run between the building and the outdoor node. Fiber is dielectric - it cannot carry surge current. Best protection option.
- **Grounding:** Properly ground your outdoor enclosure and the surge protectors. Bond all ground connections to a single earth ground point.

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