

POWER OVER ETHERNET (PoE) BEST PRACTICES

Guidelines For Reliable, Efficient Low-Voltage Poe Installations In Commercial Kitchens

Power over Ethernet (PoE) delivers both power and data over a single Ethernet cable, simplifying installation and reducing points of failure in busy kitchen environments. It eliminates the need for local power outlets, bulky power supplies, and messy cable runs at each station. When implemented correctly, PoE improves uptime, safety, and serviceability across your back-of-house technology stack.

What is Power over Ethernet (PoE)?

Power over Ethernet (PoE) is a networking technology that sends power and data over the same twisted pair cable, typically Cat5e or higher. This allows you to deploy devices exactly where they are needed—on walls, ceilings, and under hoods—without adding new electrical circuits. For kitchens, PoE reduces complexity while supporting high-performance, always-on systems.

PoE Power Classes at a Glance

Standard PoE typically refers to IEEE 802.3af, (PoE) to IEEE 802.3at, (PoE+) and 802.3bt, (PoE++). This expands available power for higher-demand devices and can support up to 90 watts at the source, depending on switch, cable quality, and endpoint design. This is especially useful for Digital Menu Boards, Order Ready Boards, and Epson Sticky paper printers, all of which exceed traditional 30-watt PoE+ limits.



Benefits of PoE in the Kitchen

- **Simplified infrastructure** – One cable for power and data, fewer outlets and power bricks.
- **Cost efficiency** – Lower electrical installation costs and reduced hardware complexity.
- **Flexible placement** – Install devices where they work best, not just where outlets exist.
- **Enhanced safety** – Centralized, low-voltage power with surge and short-circuit protection.
- **Higher reliability** – Easier to back up with UPS and maintain consistent uptime.
- **Smart power management** – Support for PoE+, PoE++, and intelligent power allocation allows higher-power devices to be deployed over standard Ethernet infrastructure while maintaining centralized control, UPS backup, and simplified serviceability.

Where We Use PoE

- **Stand-Alone Touch Screens** - Power and connect Kitchen Armor PoE all-in-one touchscreens with a single cable at each station.
- **Wireless Access Points** - Place Wi-Fi access points in optimal locations without adding electrical outlets.
- **Network Switches** - Use PoE-enabled switches to power multiple endpoints from a central rack.
- **Digital Signage & Menu Boards** - Drive order-ready boards and digital menu boards while simplifying installation.
- **IoT Devices & Sensors** - Connect sensors, smart lighting, and other IoT devices over existing Ethernet runs.
- **Printers & Media Controllers** - Support Epson label printers and Android media controllers for signage and KDS systems.

Cable Selection in PoE Low-Voltage Setups

Performance & Data Integrity

Choosing the right cable category is critical to support the required bandwidth, signal quality, and distance. Higher-grade cabling minimizes crosstalk and interference, especially in electrically noisy kitchen environments.

- Use Cat5e or Cat6 as a minimum standard for PoE installations.
- Consider Cat6a or higher for longer runs or high-bandwidth applications.
- Use shielded (STP/FUTP) cable when running near LED lighting, power conduits, or other electrical infrastructure.

Power Delivery & Voltage Drop

PoE relies on the cable's ability to safely carry current over distance. Undersized or poor-quality cable can overheat or fail to deliver enough voltage to the device.

- Use a cable with adequate current capacity to support PoE+ and PoE++ loads.
- Minimize voltage drop by using lower-resistance cable and keeping runs within recommended lengths.

LLDP-MED Configuration

We recommend disabling LLDP-MED on switch ports when using Kitchen Armor PoE devices. Many PoE endpoints do not correctly interpret LLDP-MED frames, which can cause power negotiation issues or prevent devices from powering on. Disabling LLDP-MED allows the switch to deliver default PoE power based on hardware classification for improved stability.

Heat Management

As power levels increase, cable temperature can rise, especially in tightly bundled runs. Proper cable selection and installation practices help maintain performance and extend cable life.

- Use cables with higher temperature ratings for dense bundles or high-wattage runs.
- Avoid over-tightening bundles; allow space for airflow and heat dissipation.
- Consider a shielded F/UTP cable where high PoE loads and bundling are unavoidable.

Compliance & Safety

- Use cables that meet IEEE 802.3af/at/bt PoE standards.
- Choose 23 AWG or 24 AWG copper conductors for PoE applications.
- Use plenum-rated (CMP) or other code-compliant jackets where required by local building codes.

Future-Proofing Your Infrastructure

- Invest in Cat6a, Cat7, or Cat8 where future bandwidth and power needs may grow.
- Use high-quality, all-copper cabling to reduce replacement and maintenance costs.
- Design cable pathways and patching with room to expand as new devices are added. ted (CMP) or other code-compliant jackets where required by local building codes.
- Selecting Switches or PSE (Power Sourcing Equipment) that support all versions of POE, including POE++ to 90 watts. See: Kitchen Armor Ultra Switch 24-4. 24 ports available for POE=POE+ (15-30 watts), and 4 ports available for POE++ (90 watts)

For proprietary PoE implementations, always follow the device manufacturer's specific requirements. These guidelines assume industry-standard IEEE 802.3 PoE.

Quick Reference: Best Practices for PoE Installations

DO:

- Use high-quality PoE -PoE++ (15-90 watts) switches with sufficient total power budget.
- Protect PoE switches and core network gear with a battery-backed UPS.
- Use 23 AWG Cat5e or better cabling for PoE runs.
- Install high-quality RJ45 keystone jacks with gold-plated contacts.
- Choose shielded patch cables with strain relief in high-noise areas.
- Bundle cables with Velcro straps to avoid crushing and allow heat dissipation.
- Power down PoE ports before plugging or unplugging devices.

AVOID:

- Avoid copper-clad aluminum (CCA) Ethernet cable for any PoE application.
- Do not use zip ties to tightly cinch Ethernet cable bundles.
- Avoid thin 26 AWG or 28 AWG stranded patch cables for permanent PoE runs.
- Avoid repeatedly plugging and unplugging connectors while PoE circuits are energized.

Important Safety Reminder

Always follow local electrical codes and safety guidelines when installing PoE infrastructure. Improper cable selection or handling can lead to overheating, equipment damage, or service interruptions.

Need Help Designing Your PoE Deployment?

For additional documentation and support, visit kitchenarmor.com/support/