LIGHTNING ACTIVITY
DETECTED IN THE AREA

Future-Proofing Modern ITS Equipment with PoE++ Surge Protection

Transtector ALPU-F140 and DPR-F140 PoE++ Surge Protectors:
Protecting Today and Tomorrow's ITS Infrastructure

Abstract

Power over Ethernet (PoE) has transformed Intelligent Transportation Systems (ITS), enabling streamlined deployments for cameras, detection sensors, and remote cabinets. But as agencies scale up to PoE++ (60-90W), they're exposing critical equipment to new surge risks. The environmental realities of the roadside exposes this equipment to the damaging threats of lightning and grid-switching transients.

This white paper breaks down how PoE is evolving in ITS, where it's headed next, and why high-performance PoE++ surge protection, specifically the ALPU-F140 and DPR-F140, are the foundation for uptime, safety, and standards compliance over the next decade.

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PoE in ITS Today

DOTs and integrators heavily rely on PoE to transmit both high speed data and power to:
- HD traffic cameras and pan-tilt-zoom (PTZ) surveillance
- Radar-based vehicle detection systems
- Signal and cabinet monitoring equipment
- Smart sensor platforms

PoE simplifies cabinet wiring, enables rapid expansion, and avoids the permitting delays tied to separate AC drops. It also creates a high-value, single point of failure inside the system: the Ethernet/PoE link itself.

Why Regular PoE Isn't Enough Anymore

Traditional PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at) provide up to 15.4W and 30W per port respectively, suitable for basic cameras or sensors. But next-gen ITS equipment demands more power for advanced processing, sensing, and communication, all over a single Ethernet cable. PoE++ (IEEE 802.3bt) delivers up to 60W (Class 6) or 90W (Class 8) per port.

ITS Devices That Require PoE++ (60W–90W)

The following image-enhanced table illustrates key ITS equipment types that require PoE++ capabilities, including their power justifications.

EQUIPMENT TYPE	Pan-Tilt- Zoom	360 Panoramic Camera	Lidar Unit for Vehicle & Pedestrian Detection	Edge AI Device	Dual Radar Vehicle Detection System
WHY PoE++?	Built-in motors, heating elements and optical zoom mechanisms require PoE++ to ensure full function in harsh conditions.	These devices house multiple image sensors and onboard video stitching/analytics. Power draw regularly exceeds PoE+ limits.	Lidar sensors use spinning or solid-state lasers that require continuous high power plus onboard edge processing.	AI edge units use GPUs or ASICs to perform real-time classification, license plate recognition, or traffic analysis-power-hungry tasks.	Some dual-radar systems combine forward and side-looking beams requireing continuous high-frequency transmission and digital signal processing.

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Risks at the Cabinet Edge

Without dedicated protection, PoE-connected devices are vulnerable to:
- Surge transients from nearby lightning strikes or utility events
- Ground potential differences between PoE switches and devices
- Induced voltages on long cable runs

NEC 2020 and IEEE 1613 standards now recognize the need for hardened data line protection. A UL 497B listed device is the minimum bar for signal protection in mission-critical systems.

DPR-F140 and ALPU-F140: Engineered for the Field

Both units :
- Are UL 497B listed for communication line protection
- Are NEMA TS2 tested for traffic cabinet use
- Utilize a SASD + GDT hybrid architecture for fast clamping and high energy handling
- Implement an extra 20kA GDT shield-to-ground for enhanced surge protection, EMI shielding, grounding integrity and signal integrity
- Are fully transparent to Gigabit Ethernet data and PoE++ power throughput

ALPU-F140 offers a robust, ergonomic enclosure with a patented cable entry grommet, ideal for outdoor point of use protection. DPR-F140 is ideal for DIN rail or chassis mount in modular applications.

PoE Trajectory in ITS Applications
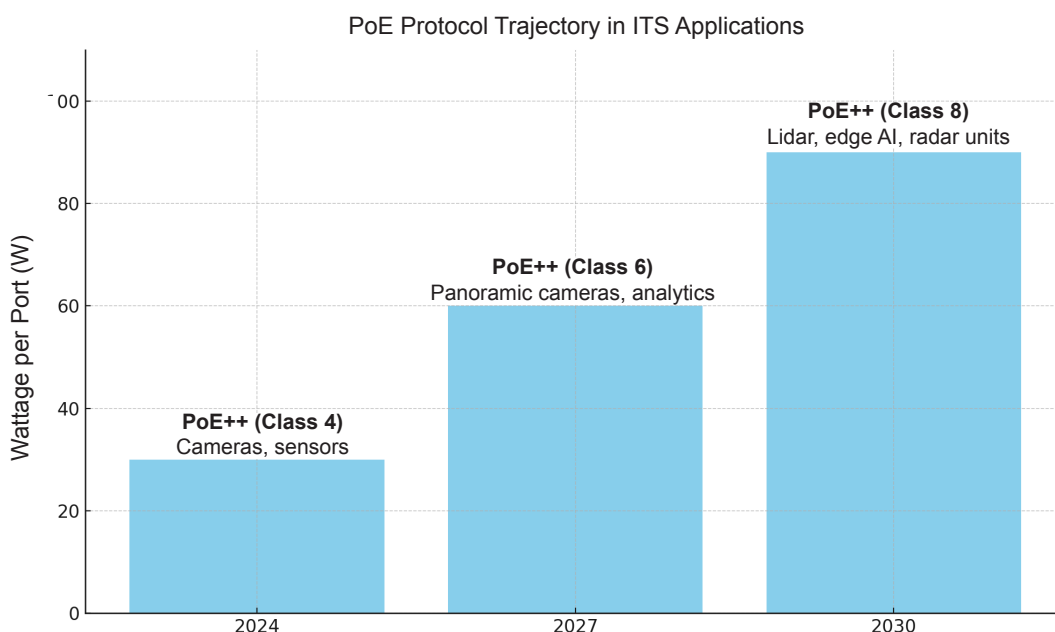
PoE Protocol Trajectory in ITS Applications

How to Specify for Long-Term Protection

When writing specs or reviewing submittals, call out:

- UL 497B certification for data line protection

- NEMA TS2 tested and qualified

- SASD + GDT hybrid technology with shield-to-ground protection

- Compatibility with all PoE Standards (PoE, PoE+, PoE++) and Gigabit Ethernet throughput

Products like the ALPU-F140 and DPR-F140 hit all these marks.

Conclusion

As ITS deployments lean more heavily on smart, high-powered edge devices, the risks to system uptime multiply. Surge protection can no longer be an afterthought.

Deploying ALPU-F140 and DPR-F140 units at the cabinet edge and at equipment points of use ensures that PoE lines won't be the weak link in the system. It's one of the simplest, most cost-effective ways to harden ITS infrastructure against the surges of today and tomorrow.

To spec these into your next project or learn more, contact Transstector at +1 (866) 480-3878 or sales@transtector.com