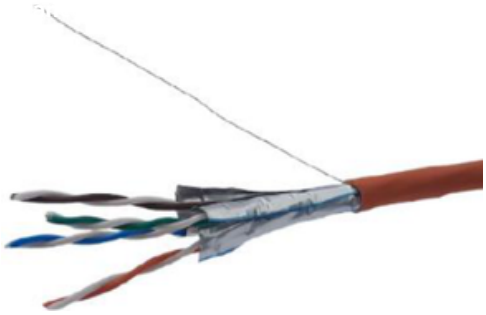
When Standards Meet Real-World Challenges: Breaking the Ethernet 100-Meter Barrier

How Aginode's EXTP Cat 6A cable delivers extended-reach copper cabling for smart campuses, industrial facilities, and large-scale deployments.



The 100-Meter Challenge: Where Reality Diverges from Standards

Structured cabling standards are built around a 100-meter channel limit — sufficient for conventional office and commercial environments. However, in large-scale smart campuses, industrial facilities, airports, and educational institutions, factors such as inter-building distances, elongated layouts, and routing constraints increasingly push real-world cable runs beyond the standard 100-meter limit.

Smart Campuses & Airports
Inter-building links, perimeter security routes, and large terminal layouts frequently extend cable channels beyond standard distances without practical locations for intermediate telecom rooms.

Industrial Facilities
Long, narrow production lines, bridge crane corridors, and overhead cable tray routing force integrators to add significant distance overhead.

High-Power PoE Endpoints
The rise of 4K PTZ cameras, Wi-Fi 7 APs, and industrial IoT devices operating on PoE++ (60W–90W) is driving higher demands on both transmission distance and power delivery.

From the perspective of building owners, consultants, and system integrators, the demand is clear and consistent:

- Achieve uninterrupted single-run channel beyond 100 meters
- Power high-wattage PoE endpoints reliably over copper without additional electrical circuits
- Future-proof the installation against bandwidth and device evolution so that costly rip-and-replace work is avoided

Where Conventional Cabling Falls Short

Standard Cat 6 — Adequate Within 100 Meters, Inadequate Beyond

Cat 6 cabling performs reliably up to 1 Gbps within the standard 100-meter channel. However, the moment a channel exceeds 100 meters, the cable's attenuation and crosstalk characteristics fall outside any standardized performance guarantee. There is no certified extension mechanism within the Cat 6 specification. Extended-reach points must be addressed by adding intermediate telecommunications rooms, splitting the channel, or introducing media converters - each adding capital expenditure, equipment, and long-term maintenance complexity.

In high-density PoE environments, standard Cat 6 cables show measurable susceptibility to voltage drop and temperature rise under sustained 60W–90W PoE++ loads, particularly when cables are bundled in conduit or deployed in high-ambient-temperature industrial spaces. Installers frequently choose not to rely on standard Cat 6 for long-distance high-power delivery, opting instead for dedicated electrical circuits — adding both installation cost and operational risk from multiple power-source points.

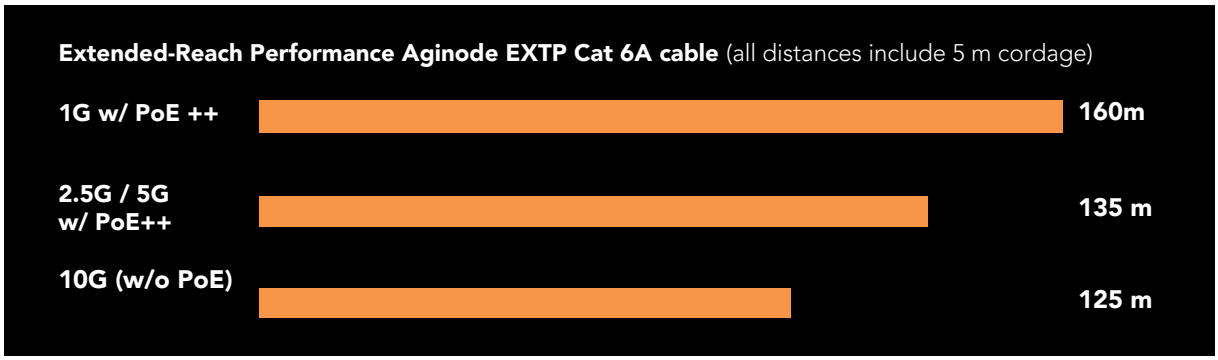
Standard Cat.6A — The Compliance Benchmark, Still Bound to 100 Meters

Cat 6A supersedes Cat 6 in bandwidth, alien crosstalk immunity, and 10G readiness, making it the preferred specification for mid-to-high-tier projects. Within 100 meters, Cat 6A supports 10 Gbps reliably and handles PoE++ under standard conditions.

However, once actual cable routes exceed the 100-meter design channel, performance is no longer governed by industry-standard guarantees. When combined with high-speed traffic and PoE++ loads, stability becomes highly dependent on installation conditions.

Introducing the Aginode Cat 6A EXTP cable

Designed in direct response to the real-world demands of large campuses, industrial facilities, airports, and major public buildings, Aginode presents the **EXTP** — an extended-reach Cat 6A cable engineered to break the 100-meter ceiling without compromising on standards compliance.



The Aginode EXTP cable is fully compliant with the Cat 6A standards. Its extended-reach and high-power PoE capabilities are achieved through two proprietary physical enhancements: an optimized 22AWG conductor geometry that reduces DC resistance and insertion loss, and a patented metal cross-separator with aluminum foil shielding that delivers superior alien crosstalk suppression and thermal stability under sustained high-power loads.

Aginode's Cat 6A EXTP Key Value Propositions

01

Eliminate Intermediate Distribution Rooms

With up to 160m of single-run copper connectivity for 1G & PoE++ applications, projects can reduce the need for additional telecom rooms, media converters, and optical repeaters. This helps lower construction costs, equipment investment, and long-term maintenance overhead.

02

Power Any PoE Device Over >100metres

Supports full 30W–90W PoE delivery with lower DC resistance, reduced voltage drop, and improved thermal performance versus standard Cat 6/6A cables — enabling direct power for 4K PTZ cameras, Wi-Fi 7 APs, and industrial IoT devices without dedicated electrical circuits.

03

A Single Installation for a 10–15 Year Lifecycle

Full Cat.6A compliance supports 1G to 10G applications, including Wi-Fi 7, 8K surveillance, and industrial IoT — enabling long-term infrastructure readiness without future re-cabling or retrofit work.

Standards + Enhancement

The EXTP sits within the Cat 6A specification family - not outside it. Every performance metric required by the Cat 6A standard is met. The extended-reach capability is additive: physical engineering enhancements that carry the cable beyond the standard limits while keeping the full compliance framework intact. Backed by Aginode's 25-year warranty program, end users, consultants and installers can spec-in with full confidence.

Product Comparison: Typical Cat 6/6A vs Purpose-Built Cat 6A

The table below illustrate the critical performance differentiation between conventional cabling options and the Aginode's extended distance offerings across the metrics that matter most for extended-reach, high-power PoE deployments.

Product	Standard-Compliant Performance w/ PoE++			Extended-Reach Performance (beyond 100m)			Key Consideration
	1G	2.5G/5G	10G	1G w/ PoE++	2.5G/5G w/ PoE++	10G (no PoE)	
Standard Cat 6 UTP	**100mtr**	**100mtr**	***Limited***	***Not supported***	***Not supported***	***Not supported***	PoE++ stability in high-temp / bundled runs requires site-specific evaluation
Standard Cat 6A UTP	**100mtr**	**100mtr**	**100mtr**	***Not supported***	***Not supported***	***Not supported***	PoE++ stability in high-temp / bundled runs requires site-specific evaluation
LANmark-6A EXTP AWG 22	**100mtr**	**100mtr**	**100mtr**	**160m**	**135m**	**125m**	**22AWG + patented shielded structure — lower voltage drop, superior thermal performance for full PoE++ range (30W–90W)**
LANmark-6A shielded AWG 23	**100mtr**	**100mtr**	**100mtr**	**145m**	**125m**	**105m**	**23AWG + shielded structure — lower voltage drop, superior thermal performance for full PoE++ range (30W–90W)**

We at Aginode believe in the Right Cable for the Real World

Standard cabling compliance sets the floor - real-world project requirements set the ceiling. Conventional Cat 6 and Cat 6A cables are purpose-built for 100-meter channels, and when deployed within that boundary they perform precisely as specified. But for smart buildings, industrial plants, airports, and campuses where a meaningful proportion of cable routes will inevitably exceed 100 meters, conventional cables force a costly compromise: add a telecom room, add a media converter, or accept an unvalidated installation.

The **Aginode EXTP** resolves that compromise by combining full Cat 6A standards compliance with a physically upgraded conductor and patented shielding architecture — delivering validated single- run copper channel **up to 160 meters** and reliable **PoE++ power delivery from 30W to 90W**. Backed by our **25-year warranty program** for any extended-reach points in any project, it is the one cable that does not require a workaround.