

Applications of Active Optical Cables (AOC)

1. Traffic Monitoring (24/7)

Traffic monitoring operates in continuous, event-driven environments where uninterrupted connectivity is critical.

- ♦ **Purpose:** Maintain consistent connection to operator screens showing real-time data on traffic conditions, hazards, and delays.
- ♦ **Key benefit:** AOC is an all-in-one connectivity solution that **removes extenders and other potential points of failure**, providing consistent signal quality to keep traffic operations on time and safe.



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2. Security & Surveillance

Security surveillance centers require fail-safe cabling supporting the highest possible video quality.

- ♦ **Purpose:** Monitor criminal activity, emergencies, and dangerous events to protect property and people.

- ◆ **Key benefit:** AOCs support **HD, 4K, and 8K video resolutions over long distances** with a consistent, error-free signal.
- ◆ **Result:** Operators see everything clearly with **zero downtime**, keeping people and property safe.

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LONG DISTANCE
TRANSMISSION



FAIL-SAFE
PERFORMANCE



HIGH BANDWIDTH
HIGH RESOLUTION



ZERO DOWNTIME
RELIABILITY

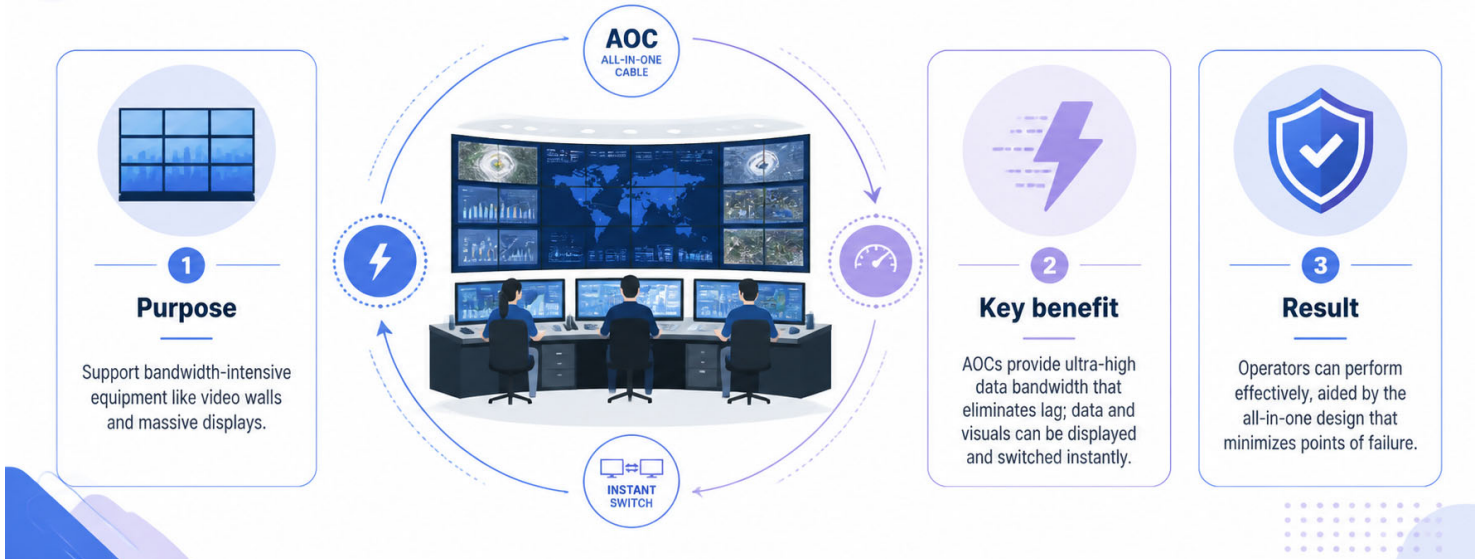
3. Control Rooms

Control and command centers depend on AV systems for split-second decisions that prevent disasters.

- ◆ **Purpose:** Support bandwidth-intensive equipment like video walls and massive displays.
- ◆ **Key benefit:** AOCs provide **ultra-high data bandwidth that eliminates lag**; data and visuals can be displayed and switched instantly.
- ◆ **Result:** Operators can perform effectively, aided by the all-in-one design that minimizes points of failure.

Control Rooms

Control and command centers depend on AV systems for split-second decisions that prevent disasters.



4. Healthcare & Medical

Hospitals rely on AV systems in imaging centers, labs, and other critical areas where disruption puts patients at risk.

- ◆ **Key benefit:** Unlike copper, AOCs feature a **zero RFI/EMI profile that eliminates electromagnetic interference** (critical around sensitive medical equipment).
- ◆ **Result:** Reliable signal transmission in operations where **zero downtime is a must**.

Sub-Applications:

- ◆ **Medical Imaging:** High-speed, low-latency, reliable transmission of high-quality image data between imaging devices, monitors, and workstations — improving diagnostic accuracy.
- ◆ **MRI Scan Imaging:** Tailored fiber solutions for comfortable patient experiences and guided interventions.
- ◆ **CT Scan Imaging:** Custom/retrofitted cables that enhance imaging quality for computer tomography scanners.

- ◆ **Diagnostics & Treatment:** Sensor-based and spectroscopic applications enabling early detection and cost-effective treatment.



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KEY BENEFIT

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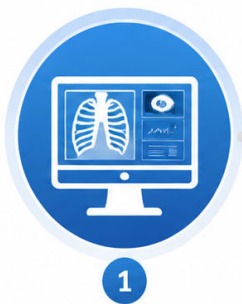


RESULT

Reliable signal transmission in operations where zero downtime is a must.



Sub-Applications



1

Medical Imaging

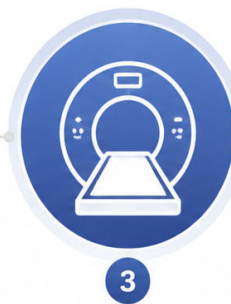
High-speed, low-latency, reliable transmission of high-quality image data between imaging devices, monitors, and workstations, improving diagnostic accuracy.



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MRI Scan Imaging

Tailored fiber solutions for comfortable patient experiences and guided interventions.



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CT Scan Imaging

Custom and retrofitted cables that enhance imaging quality for computer tomography scanners.



4

Diagnostics & Treatment

Sensor-based and spectroscopic applications enabling early detection and cost-effective treatment.

5. Education

Lecture halls are large spaces with numerous screens displaying lessons to hundreds of students.

- ♦ **Problem:** Copper cable struggles to extend to many screens without failure-prone extenders in large rooms.
- ♦ **Key benefit:** AOCs extend UHD video hundreds of meters without extra software or devices — ideal for lecture halls with multiple screens.



Education



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- ♦ **Sub-applications:**
- ♦ **AR/VR:** Virtual Reality Headset Cables enable immersive, interactive learning experiences.
- ♦ **HD Video Conference Systems:** Uninterrupted communication for distance learning.
- ♦ **Simulation Systems:** Real-time data transfer for fields like medical training.
- ♦ **Remote Learning:** Seamless online lessons, workshops, and seminars.

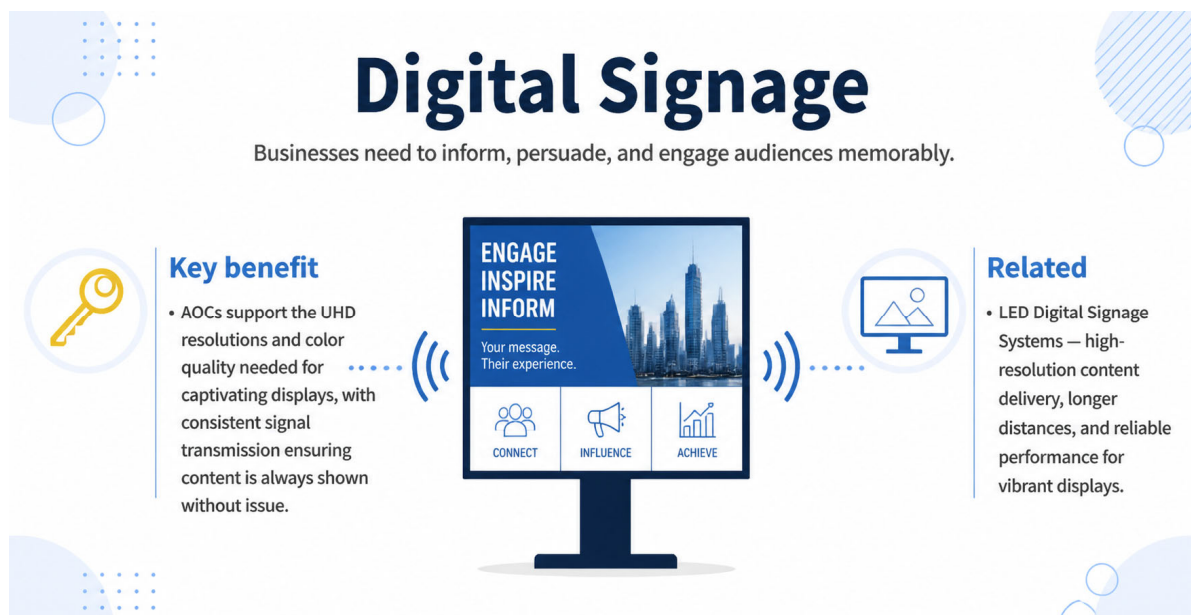
Sub-applications



6. Digital Signage

Businesses need to inform, persuade, and engage audiences memorably.

- ◆ **Key benefit:** AOCs support the **UHD resolutions and color quality** needed for captivating displays, with **consistent signal transmission** ensuring content is always shown without issue.
- ◆ **Related:** LED Digital Signage Systems — high-resolution content delivery, longer distances, and reliable performance for vibrant displays.



7. Conference Rooms

Presenters with limited technical experience must connect devices to screens easily.

- ◆ **Key benefit:** AOCs are a **plug-and-play solution** requiring no training or technician assistance.
- ◆ **HD Conferencing / Video Conference Systems**
- ◆ **Key benefit:** Deliver extended reach, flexible installation, and EMI immunity for high-definition video and audio.
- ◆ Support high-resolution video streams, crystal-clear audio, and low-latency transmission.
- ◆ Ideal for video conferencing, telepresence, and conference room setups.

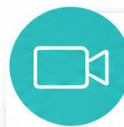
Conferencing Solutions



Conference Rooms



- ✓ AOC plug-and-play: No training needed
- ✓ Easy device-to-screen connections



HD Conferencing / Video Conference Systems



- ✓ Extended reach & flexible installation
- ✓ EMI immunity, low-latency
- ✓ Crystal-clear high-res video & audio

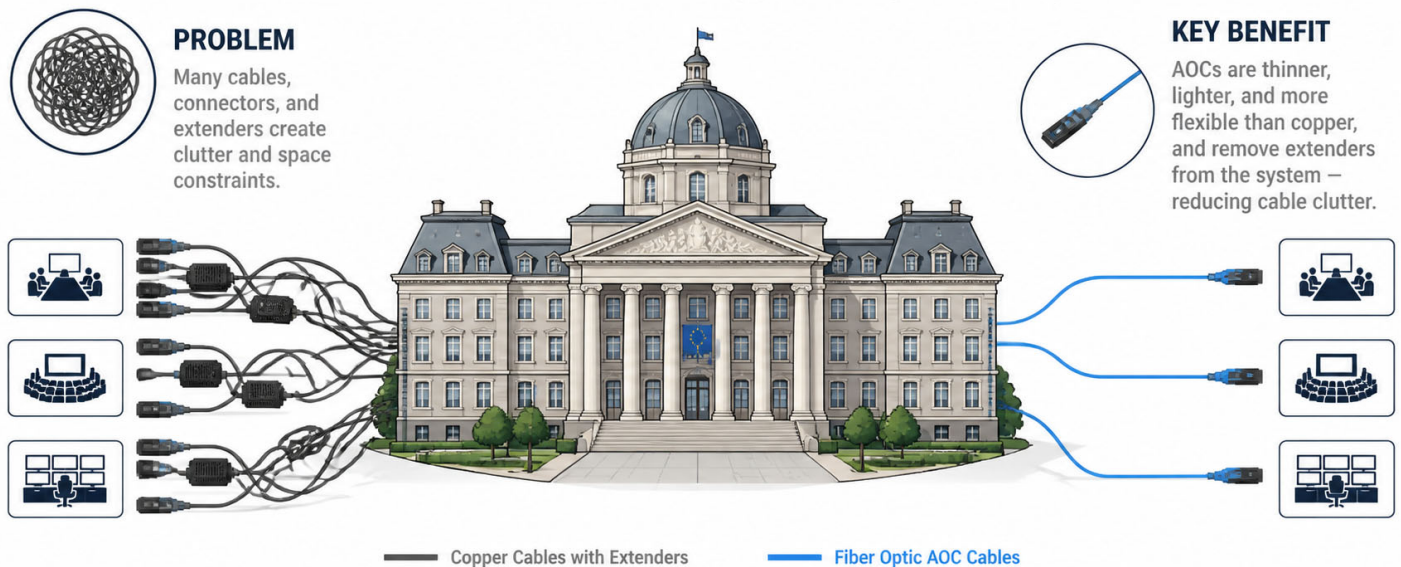
8. Government Campuses

Government installations contain vast AV equipment throughout their campuses.

- ♦ **Problem:** Many cables, connectors, and extenders create clutter and space constraints.
- ♦ **Key benefit:** AOCs are **thinner, lighter, and more flexible than copper**, and remove extenders from the system — reducing cable clutter.

Government Campuses

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9. USB4 40Gb/s Active Optical Cable Applications

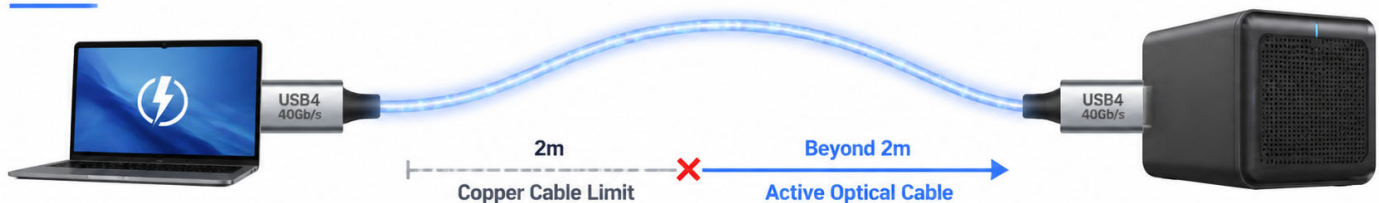
This cable breaks the two-meter distance limit of copper Thunderbolt/USB4 cables, enabling:

- ♦ **Relocating high-performance RAID storage** to reduce noise distraction.
- ♦ **Thunderbolt Share connectivity** between devices at greater distances in the same room.
- ♦ **Expanding device daisy-chain lengths.**

- ◆ **Placing/hiding externally powered devices** for a more aesthetic work environment.
- ◆ **Powering notebooks via Thunderbolt (USB-C) Power Delivery** — up to 240W (3M) or 60W (4.5M).
- ◆ **Enhancing cable management** by placing AV devices in a rack.
- ◆ **Camera freedom** with tethering during in-studio shoots.
- ◆ **Extending Thunderbolt/USB4 network connectivity** between rack-mounted devices.
- ◆ **Gaming:** Distancing an eGPU from a laptop for full immersion while freeing room for monitors, mic, and camera.
- ◆ **Audio Visual:** Crystal-clear audio, vibrant visuals, up to 8K resolution, and lag-free transmission.

USB4 40Gb/s Active Optical Cable Applications

Breaks the 2-meter limit of copper Thunderbolt/USB4 cables



- 1 Relocate RAID storage, reduce noise
- 2 Device connectivity across the room
- 3 Extend daisy-chain lengths
- 4 Hide devices for tidy workspace
- 5 240W (3M) / 60W (4.5M) Power Delivery
- 6 AV devices in a rack
- 7 In-studio camera tethering freedom
- 8 Rack-to-rack USB4 network
- 9 Distance eGPU from laptop
- 10 8K audio-visual, lag-free

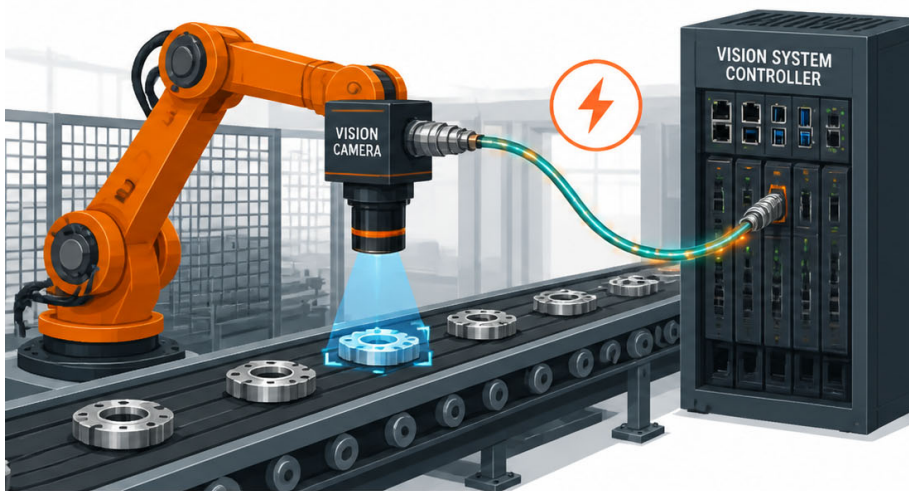
11. Industrial & Machine Vision

Industrial camera and vision sensor link cables are crucial for system stability and performance.

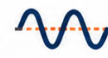
- ◆ **Key benefit:** Active fiber optic USB cables offer exceptional speeds, signal quality, extended distances, EMI immunity, and resistance to degradation — built to withstand industrial environments.

Industrial & Machine Vision

Industrial camera and vision sensor link cables are crucial for system stability and performance.



Exceptional Speeds



Signal Quality



Extended Distances



EMI Immunity



Resistance to Degradation



Built to withstand industrial environments.

Sub-Applications:

AOI Inspection (Automated Optical Inspection): USB 3.0 Vision cables detect defects in PCB/soldering production, improving accuracy and reducing manual inspection costs.

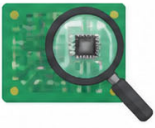
Manufacturing / Pharmacy: Ensures pill blister pack integrity, measures filling levels, verifies barcodes/QR codes, and checks package inserts.

Printing Industry: Detects color, material, printing, and QR code defects with high resolution, fast frame speed, and long cable length.

- ◆ **Food Packaging:** Ensures package integrity, checks liquid levels and bottle caps, inspects appearance, and provides accurate counting.
- ◆ **Somatosensory Applications:** Extends USB signals for VR, AR, gaming, education, and medical treatment.
- ◆ **3D Scanning:** Extended distance and ultra-soft cable enable seamless integration of HD cameras and robot arms.

Sub-Applications

Versatile solutions across industries with reliable USB 3.0 Vision connectivity.

1 AOI Inspection (Automated Optical Inspection)	2 Manufacturing / Pharmacy	3 Printing Industry
 USB 3.0 Vision cables detect defects in PCB/soldering production, improving accuracy and reducing manual inspection costs.	 Ensures pill blister pack integrity, measures filling levels, verifies barcodes/QR codes, and checks package inserts.	 Detects color, material, printing, and QR code defects with high resolution, fast frame speed, and long cable length.
4 Food Packaging	5 Somatosensory Applications	6 3D Scanning
 Ensures package integrity, checks liquid levels and bottle caps, inspects appearance, and provides accurate counting.	 Extends USB signals for VR, AR, gaming, education, and medical treatment.	 Extended distance and ultra-soft cable enable seamless integration of HD cameras and robot arms.

12. Broadcast Systems

- ◆ **Purpose:** Transform broadcasting operations with **ultra-high bandwidth, low latency, and reliable transmission** for flawless live broadcasting and content distribution.

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Ultra-high Bandwidth



Low Latency



Reliable Transmission



13. Simulation Systems

- ◆ **Purpose:** Enhance training and simulation with **real-time data transfer, low latency, and high-fidelity visuals and audio** for realistic, immersive simulations.

Simulation Systems

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REAL-TIME
DATA TRANSFER



LOW
LATENCY



HIGH-FIDELITY
VISUALS & AUDIO



14. Data Centers & High-Performance Computing (HPC)

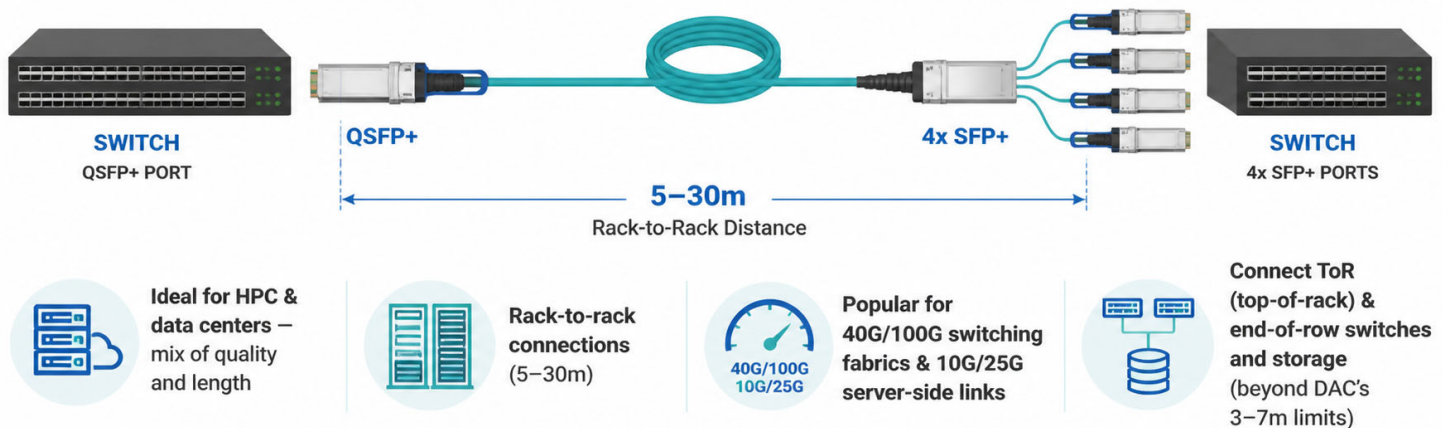
AOCs are deployed as an upgrade to conventional DAC (Direct Attach Copper) cables.

- ♦ Ideal for **high-performance computing and data centers** where a mix of quality and length is required.
- ♦ **Rack-to-rack connections** (5–30 meters).
- ♦ Popular in planning **40G/100G switching fabrics** and **10G/25G server-side connections**.
- ♦ Connect **top-of-row (ToR) and end-of-row switches** to each other and to storage subsystems (exceeding DAC's 3–7m limits).
- ♦ Example: A **40G QSFP+ to 4x SFP+ AOC** connects two switches.
- ♦ Common in PCs, HDTV, electronics, and supercomputers/mainframes.

Data Centers & HPC

Active Optical Cables (AOC)

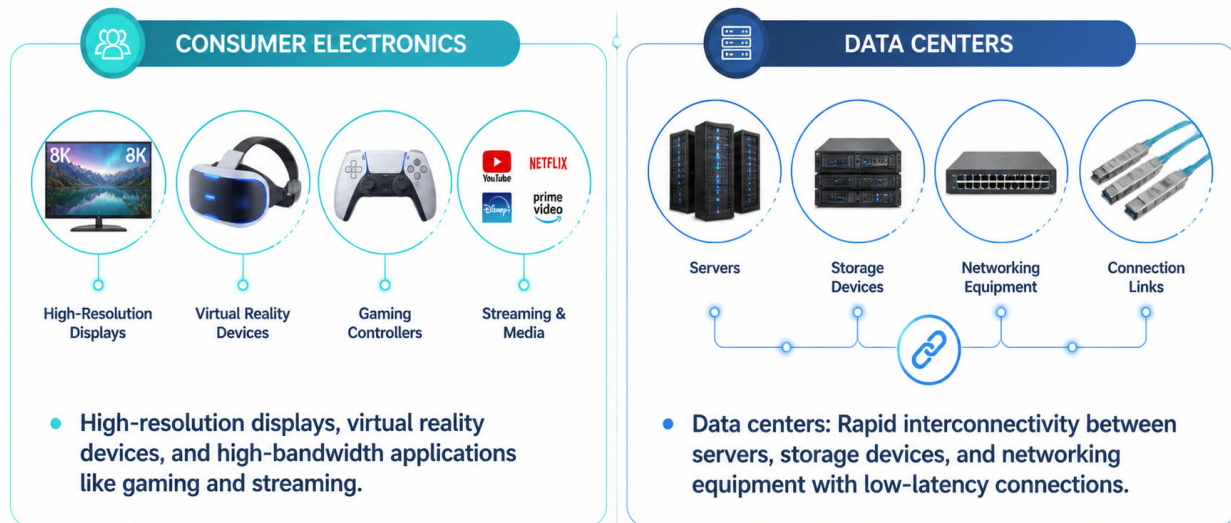
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15. Consumer Electronics & IT

- ◆ **High-resolution displays, virtual reality devices,** and high-bandwidth applications like gaming and streaming.
- ◆ **Data centers:** Rapid interconnectivity between servers, storage devices, and networking equipment with low-latency connections.

Consumer Electronics & IT



16. Aerospace, Defense & Automotive

- ◆ AOCs find applications in these sectors where **high-speed and robust connectivity** are vital.

Aerospace, Defense & Automotive



 AOCs find applications in these sectors where high-speed and robust connectivity are vital.

Applications of Active Optical Cable (AOC)

High-speed, long-distance connectivity across diverse industries.



1 Traffic Monitoring

Uninterrupted connectivity for real-time traffic data, safety and efficiency.



2 Security & Surveillance

HD/4K/8K video support, effective monitoring without downtime.



3 Control Rooms

Ultra-high bandwidth for instantaneous data and video switching.



4 Healthcare

EMI/RFI immunity ensures reliable transmission in medical environments.



5 Education

Connectivity in large lecture halls, overcoming copper cable limits.



6 Digital Signage

High-quality displays with consistent transmission of information.



7 Conference Rooms

Plug-and-play design makes connectivity easy for presenters.



8 Government Campuses

Thinner and more flexible than copper, reducing cable clutter.



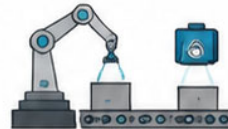
9 USB4 Applications

Extends reach while maintaining power and signal integrity.



10 Audio Visual Entertainment

Superior signal quality for home theaters and gaming.



11 Industrial & Machine Vision

Durable, high-performance for automated inspection.



12 Broadcast Systems

High bandwidth and low latency for seamless content delivery.



13 Simulation Systems

Real-time transmission for realistic training.



14 Data Centers & HPC

Pivotal for high-performance computing and extensive configurations.



15 Consumer Electronics & IT

High-res displays, VR devices, and high-bandwidth apps.



16 Aerospace, Defense & Automotive

High-speed, robust connectivity for critical sectors.

Core Benefits



Reliability



Long Distance



EMI Immunity



High Bandwidth



Flexible Installation



Power Delivery



Plug-and-Play