NeoLink

INFOIBT AV 4K60 and USB Transmission Technology

White paper V1.0

The **INFOBIT AV NeoLink** architecture delivers long-distance, zero-latency connectivity over standard Cat6a cabling up to 100 meters (328 feet), divided into two specialized tiers to handle both ultra-high-definition AV distribution and high-speed peripheral data:

1. INFOBIT AV NeoLink AV Core (Uncompressed 4K60 Distribution)

Engineered for mission-critical audiovisual transport, the primary **NeoLink AV Core** transmits uncompressed 4K@60Hz (4:4:4) HDR video alongside multi-channel audio, Ethernet, bidirectional control signals (RS-232/IR), and power over a single category cable.

- **Key Capabilities:** Delivers visually lossless, zero-latency video with integrated USB 2.0 pass-through (up to 480 Mbps) for standard HID peripherals like keyboards, mice, and touchscreens.
- **Best For:** Digital signage, boardrooms, lecture halls, and command centers requiring pristine, uncompressed video over long runs.

2. INFOBIT AV NeoLink USB3 Series (High-Speed 5Gbps Peripheral Extension)

To overcome the bandwidth limits of traditional AV extenders when supporting modern conferencing and imaging gear, the **NeoLink USB3 Series** dedicates up to 6 Gbps of link performance specifically to USB 3.2 Gen 1 (5 Gbps) data extension over 100 meters of Cat6a cable.

- **Key Capabilities:** Supports true plug-and-play, zero-latency USB 3.2 Gen 1 and backward-compatible USB 2.0/1.1 transmission, complete with bidirectional power delivery and control pass-through.
- **Best For:** 4K PTZ conferencing cameras, interactive whiteboards, high-speed storage, and industrial or medical machine-vision cameras.

3. How the INFOBIT AV NeoLink Ecosystem Works Together

Feature	NeoLink AV Core	NeoLink USB3 Series
Primary Role	Complete uncompressed AV & control distribution	Dedicated high-bandwidth USB 3.2 data extension
Video Transport	Uncompressed 4K60 4:4:4 HDR	USB-based video streams (e.g., 4K webcams)
USB Bandwidth	USB 2.0 (up to 480 Mbps)	**USB 3.2 Gen 1 (up to 5 Gbps)**
Transmission Distance	Up to 100 meters (328 ft) over Cat6a	Up to 100 meters (328 ft) over Cat6a
Latency	Near-zero latency	Zero latency

By combining both technologies under the **INFOBIT AV NeoLink** umbrella, integrators can deploy unified category-cable infrastructure that handles both uncompressed 4K displays and bandwidth-heavy USB 3.2 conferencing devices simultaneously without signal compression or distance bottlenecks.

The **INFOBIT AV NeoLink** architecture delivers true **full-feature USB-C** connectivity over standard Cat6a cabling up to 100 meters (328 feet), allowing a single USB-C cable at the desk or lectern to handle ultra-high-definition video, high-speed peripheral data, network pass-through, and laptop power simultaneously.

4. What Full-Feature USB-C Means in NeoLink

1. **4K & Ultrawide Video Output (DisplayPort Alt Mode):** Carries uncompressed, zero-latency video signals—including 4K@60Hz (4:4:4) and 21:9 ultrawide resolutions up to 5120×2160@30Hz—directly from a host laptop to room displays without compression artifacts.

2. **Simultaneous High-Speed USB 3.2 Data (Up to 5 Gbps):** Unlike legacy extenders that throttle USB connections down to USB 2.0 when carrying 4K video, NeoLink preserves full **USB 3.2 Gen 1 (5 Gbps)** bandwidth alongside video. Hosts gain instant, plug-and-play access to 4K PTZ conferencing cameras, interactive touchscreens, speakerphones, and high-speed external drives across the room.

3. **Host Charging (USB Power Delivery up to 100W):**Provides up to **60W–100W of USB-C Power Delivery** back to the connected laptop or tablet, eliminating the need for users to carry or plug in separate power bricks during meetings or lectures.

4. **Integrated Ethernet & Control Pass-Through:** Bridges gigabit Ethernet and bidirectional control signals (RS-232/GPIO) over the same single-cable link, giving guest laptops a wired network connection and enabling automated display wake/sleep control upon plug-in.

5. Key Deployment Advantages

Capability	Standard USB-C Cable	Legacy AV Extenders	INFOBIT AV NeoLink (Full-Feature USB-C)
Max Distance	1–2 meters (passive)	Up to 100 meters	**Up to 100 meters (328 ft) via Cat6a**
Video + USB 3.2 Simultaneously	Yes (short range only)	Drops to USB 2.0 with 4K	**Yes — 4K video + 5 Gbps USB 3.2**
Laptop Charging	Up to 100W	Typically unsupported	**Up to 60W–100W USB PD**
BYOD User Experience	Cluttered adapters needed	Multiple cables (HDMI + USB)	**True single-cable plug-and-play**

6. Ideal Use Cases

- **BYOD / BYOM Conferencing Rooms:** Participants walk in, connect a single USB-C cable to their laptop, and immediately drive the room's dual/4K displays, room camera, microphone array, wired network, and laptop charging.
- **Smart Classrooms & Lecterns:** Instructors connect a laptop or tablet at the podium to control distant projectors, document cameras, and interactive displays over existing Cat6a infrastructure without signal degradation.