H.264/H.265 4K60 4:4:4 AV over IP Transceiver — Switchable ENC/DEC

An All-In-One 4K60 H.265/H.264 AV over IP solution supporting 4:4:4 encoding and decoding for true color restoration. Supports fiber and copper with automatic switching (copper priority). One unit switches between encoder and decoder mode via rear-panel MODE toggle — simplifying inventory and installation. Provides ultra-low latency audio/video extension over a standard 1G managed switch up to 328ft/100m. Supports seamless switching, video wall, multiview, KVM seat management, text overlay, IPC camera integration, and multi-level user rights management.

> **Surge Protection Recommended —** Use surge protection systems to protect sensitive electrical components.

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2. FEATURES

✓ Switchable ENC/DEC — single unit, rear-panel MODE switch; simplifies stock management

✓ H.265/H.264 codec — 4K@60Hz 4:4:4, HDMI 2.0b, HDCP 2.2, 18Gbps bandwidth

✓ Copper LAN/PoE + Fiber SFP — both active, copper priority, automatic selection

✓ Up to 36 simultaneous streams on decoder — windowing, roaming, overlay, splicing

✓ Seamless switching — no black screen, flash, jitter, or tearing

✓ KVM seat management — one-to-many, seat roaming, man-machine separation

✓ Text overlay, scrolling subtitles, banner, and logo display

✓ IPC camera integration — Hikvision, Dahua, Yushi with PTZ control

✓ Multi-level user rights management — hierarchical, account follows person

✓ RTSP sub-streams: MainStream 1080P30 / SubStream 720P30

✓ Low latency: 16ms text / 33ms video — PoE 802.3at or DC 12V/2.5A

3. Package Contents   4. Specifications

1× AVO-IP265-4K Transceiver | 2× 6-pin 3.81mm Phoenix connectors | 1× 3-pin 3.81mm Phoenix connector | 1× DC 12V/2.5A locking power supply | 2× Mounting ears | 4× Machine screws (M3×4)

| SPECIFICATION	
	Technical
Video Codec	H.265 / H.264	HDMI 2.0b	HDCP 2.2	18Gbps	4K@60Hz 4:4:4
Color Depth / Space	8/10/12-bit	RGB 4:4:4, YCbCr 4:4:4/4:2:2/4:2:0
Audio Formats	LPCM 2.0CH, 16-bit, 48kHz	Encoding sample rate: 48kHz
Sub-streams	MainStream: RTSP 1080P@30Hz	SubStream: RTSP 720P@30Hz
Latency	Text mode: 16ms	Video mode: 33ms
Decoder Streams	Up to 36 simultaneous — arbitrary windowing, roaming, overlay, splicing
ESD Protection	IEC 61000-4-2: ±15kV (air-gap) / ±8kV (contact)
	Connection
Video Input	1× HDMI IN (Type A, 19-pin) — active in ENC mode
Video Output	1× HDMI OUT (Type A, 19-pin) — loop out (ENC) or decoded output (DEC)
Audio	2× Audio IN (6-pin 3.81mm Phoenix, balanced stereo)	2× Audio OUT (6-pin 3.81mm Phoenix)
Network	1× LAN/PoE (RJ45, 1000M Base-T)	1× SFP (1G Fiber) — copper priority
USB	1× USB HOST (Type B) — ENC KVM	2× USB 1.1 DEVICE (Type A) — DEC KVM
Control	1× RS-232 (3-pin 3.81mm Phoenix)	MODE switch (ENC/DEC)
	Control & Power
Control Methods	RS-232, TCP/IP, Web GUI, RTSP/VLC, KVM, mobile app
Controller	AVO-IPCTL-265 / CTL500H (sold separately)
Power	PoE 802.3at Class 3 PD or DC 12V/2.5A — DC preferred when both active
Power Consumption	Encoder: 12W	Decoder: 8.5W
Transmission Distance	Up to 328ft / 100m (copper)	Fiber: SFP module dependent
	Physical
Housing / Color	Metal enclosure, Black
Dimensions (W×D×H)	8.03″ × 5.20″ × 1.18″ (204 × 132 × 30mm)
Net Weight	1.68 lbs (760g)
Power Supply	AC100–240V 50/60Hz, DC 12V/2.5A (CE/FCC/UL)
Temperature / Humidity	Operating: 32–104°F	Storage: -4–140°F	Operating: 20–80% / Storage: 10–90% RH

5. Operation Controls and Functions

5.1 FRONT PANEL

#	Name	Function
1	OLED Display	Shows device name and IP address on power-on. Screen off after 90 seconds. Short press POWER button to show current mode and IP.
2	ENC LED (Green)	On when device is in Encoder mode.
3	DEC LED (Green)	On when device is in Decoder mode.
4	LINK LED (Green)	Flashes when network is connected normally.
5	100M(Y)/1000M(G)	Yellow = 100M connection. Green = 1000M connection.
6	READY LED	On = system running normally or standby. Flashes 1Hz = fault detected.
7	POWER LED	On = working normally. Off = standby or powered off.
8	Power Button	Short press: view mode/IP on OLED. Hold 2+ seconds: power off. Power-off memory: restores to previous on/standby state on next power cycle.

5.2 REAR PANEL
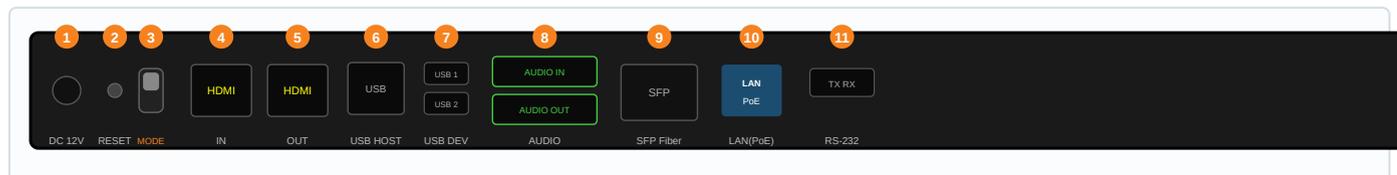
#	Name	Function
1	DC 12V	DC 12V/2.5A input. When both DC and PoE are connected, DC takes priority.
2	RESET	Hold 5 seconds: factory default settings + reboot. Hold 15 seconds: restore factory software version.
3	MODE Switch	Toggle ENC (down) / DEC (up). Restart required after switching.
4	IN (HDMI)	HDMI 2.0b input — connect source device (PC, PS4, Blu-ray). Active in ENC mode.
5	OUT (HDMI)	HDMI 2.0b output — HDMI loop out (ENC) or decoded video output (DEC).
6	USB HOST	USB Type B — connect to PC/computer in ENC mode for KVM.
7	USB DEVICE ×2	USB 1.1 — connect keyboard and mouse in DEC mode for KVM operation.
8	AUDIO IN / OUT	Balanced stereo 6-pin 3.81mm Phoenix. ENC: analog audio embedding. DEC: analog audio de-embedding.
9	SFP	1G fiber — connect via SFP module (not included). Auto-selects when copper absent.
10	LAN (PoE)	1G RJ45 — copper AV transmission. PoE 802.3at Class 3 PD. Preferred over SFP when both connected.
11	RS-232	3-pin 3.81mm Phoenix — RS-232 relay command pass-through from AVO-IPCTL-265.

6. VLC Pull Streaming Operation Guide

The AVO-IP265-4K supports playing MainStream and SubStream via VLC media player or any RTSP-compatible application.

Step 1: Connect the transceiver (in ENC mode) to a PC, HDMI source device, and power supply via the same 1G managed switch.

Step 2: View the IP address of the encoder on the OLED front panel display.

Step 3: Set the PC's IP address to the same network segment as the encoder.

Step 4: Open VLC media player on the PC.

Step 5: Click **Media → Open Network Stream**.

Step 6: Enter a MainStream or SubStream network URL, then click **Play**.

Stream	Network URL	Resolution
MainStream	`rtsp://[IP]:554/chn0/main`	1080P@30Hz
SubStream	`rtsp://[IP]:554/chn0/sub`	720P@30Hz

To verify stream settings: **Tools → Codec Information** (or Ctrl+J) to view codec, resolution, and frame rate. Use **Tools → Statistics** to monitor bitrate.

Note — Replace [IP] with the encoder's IP address as shown on the OLED display. Default static IP: 169.254.10.1. DHCP or Auto IP may assign a different address.

7. Main Functions and Characteristics

7.1 STABLE ARCHITECTURE

Standard H.264/H.265 encoding with high image quality, small bandwidth, and low latency. Supports signal distribution, switching, extension, and matrix mode. Unlimited device quantity with Gigabit Switch. Seamless integration of H.264/265 for IP camera (IPC) access and security system integration.

7.2 HIGH QUALITY IMAGE

True 4K@60Hz 4:4:4 ultra-high resolution — 4:4:4 encoding and decoding for true color restoration. HDMI 2.0b compliant. Output resolution customizable. Synchronization within 100µs across all display types including LCD splicing walls and small-pitch LED.

7.3 SEAMLESS SWITCHING

Source switching is instantaneous with no black screen, flash, jitter, or tearing. The visual experience is fully smooth — unlike traditional matrix switchers that interrupt the display during source changes.

7.4 INTEGRATED DESIGN

Single-unit encoder/decoder design simplifies stock management, installation, and maintenance. The same unit can be set to ENC or DEC mode via the rear-panel MODE switch. Supports IPC access — directly connects and decodes Hikvision, Dahua, and Yushi IP cameras on the network. PTZ control supported.

7.5 VIDEO WALL

High-performance splicing in both horizontal and vertical directions. Top-notch image processing for acquisition, encoding, transmission, decoding, and frame synchronization — no frame loss or lag even with fast-moving video. Supports high-definition background images.

7.6 FREE WINDOW DISPLAY OUTPUT (MULTIVIEW)

A single decoder can process **up to 36 simultaneous streams** — enabling arbitrary windowing, roaming, overlaying, and splicing on one screen. Split screen presets: 1/4/9/16 windows. Ideal for command centers, operator stations, and visualization walls.

7.7 SUBTITLE / BANNER / LOGO DISPLAY

Supports scrolling subtitles, input/output character overlay, LED bar screen, and banner display. Font, color, size, and position are freely configurable. Text can be overlaid on any source in the system without external overlay hardware.

7.8 KVM COLLABORATIVE MANAGEMENT

KVM seat management provides centralized control of multiple PCs from a single operator console:

✓ **Signal push management** — push current signal to other operators or large screens for quick collaborative scheduling
✓ **Visual takeover** — shortcut keys and OSD menu for fast signal switching, push, and control
✓ **Seat roaming** — single display shows 1/4/9/16 split screen; accounts follow the operator's login position
✓ **One person, multiple machines** — one keyboard and mouse controls multiple PCs; single PC can span multiple displays
✓ **Man-machine separation** — PCs centrally managed in machine room; operators access remotely in real time

7.9 ADDITIONAL PRACTICAL FUNCTIONS

✓ **RS-232 relay** — passes RS-232 commands from AVO-IPCTL-265 to connected devices
✓ **HDMI loop out** — convenient for signal cascading or local signal monitoring (ENC mode)
✓ **PoE power supply** — reduces installation wiring and cost; 802.3at Class 3
✓ **Audio embedding/de-embedding** — balanced stereo analog audio IN/OUT for flexible routing

7.10 MULTI-LEVEL USER RIGHTS MANAGEMENT

Supports hierarchical management of user rights and simultaneous multi-user access. Rights and responsibilities are clearly defined through IP distribution-based access control. Hierarchical and grouped rights are allocated to form a detailed access list. The account follows the person — users can roam between seats with their permissions intact, ensuring accountability is always assigned to the individual.

Note — Full feature access including video wall configuration, multiview, KVM seat management, user rights management, and text overlay requires the **AVO-IPCTL-265** (CTL500H) Controller Box. Point-to-point operation without the controller is supported.

Network Switch Requirements

The AVO-IP265-4K requires a 1G managed network switch. The following features must be configured:

✓ Gigabit (1G) ports on all AV endpoints

✓ IGMP Snooping enabled (multicast stream management)

✓ Jumbo Frames supported (recommended for video wall and multiview deployments)

AVO-IPCTL-265 Controller Setup

The AVO-IP265-4K is managed by the **AVO-IPCTL-265** (CTL500H) Controller Box (sold separately). For full system control setup, refer to the AVO-IPCTL-265 User Manual.

The controller provides a web-based GUI for matrix switching, video wall configuration, multiview layout, KVM seat management, text overlay, user rights management, and IPC camera integration. Connect the Controller to the same 1G managed switch as all transceivers.

Scenario	Steps
DHCP available	Connect Controller to managed switch. Set PC to "Obtain IP automatically." Navigate to Controller's DHCP-assigned IP in browser.
No DHCP server	Controller falls back to static IP. Set PC to same subnet. Navigate to controller IP in browser.
Point-to-point (no controller)	Set one transceiver to ENC mode, one to DEC mode via MODE switch. Connect both to same switch. Encoder OLED shows IP. DEC subscribes to ENC stream automatically.

MODE Switch Note — After toggling the rear-panel MODE switch between ENC and DEC, the device must be restarted for the change to take effect. The OLED display shows the current active mode (ENC or DEC LED on front panel confirms).

Fiber SFP Note — SFP module is not included. Select appropriate SFP based on fiber type (single-mode / multi-mode) and distance. Copper LAN/PoE has priority when both are connected — fiber activates automatically when copper is absent.

8. Application Example

MATRIX SWITCHING, VIDEO WALL & MULTIVIEW

HDMI Sources PC / AV		

IPC Cameras
Hikvision/Dahua → AVO-IP265-4K
ENC Mode ×N
H.265 Stream → 1G Switch → AVO-IP265-4K
DEC Mode ×N
36 Streams →

Media Players
TV Box / Blu-ray

Video Wall
Spliced

Multiview
36 streams

KVM Seats
Roaming

AVO-IPCTL-265
Controller (sold separately)

Mobile/iPad/PC
Control App

Full System: Transceivers in ENC mode distribute 4K60 H.265 from HDMI sources and IP cameras. Transceivers in DEC mode output to video walls, multiview displays, and KVM seats (up to 36 streams per decoder). AVO-IPCTL-265 manages routing, video wall layout, KVM seat roaming, user rights, and text overlay. IPC cameras integrate directly — no separate NVR required for live display. Seamless switching throughout.

POINT-TO-POINT EXTENSION — NO CONTROLLER REQUIRED

HDMI Source → AVO-IP265-4K
ENC Mode → 1G Switch → AVO-IP265-4K
DEC Mode → HDMI Display

Point-to-Point: Set one transceiver to ENC mode (MODE switch down), one to DEC mode (up). Connect both to the same 1G managed switch. The decoder subscribes to the encoder stream automatically. No controller required. RTSP sub-streams accessible via VLC at any time.