HW-OMNI-E4521
Specification Sheet
Networked AV Encoder with USB-C plus USB Hub



Description

The HW-OMNI-E4521 is a networked AV encoder for HDMI sources up to 4K/60 4:4:4 and HDR, plus embedded audio, RS-232 or IR control pass-through, and an integrated USB-C input with USB hub. Powered by the advanced VCx™ codec, it delivers 4K/60 4:4:4 from encode to decode with artifact-free presentation and ultra-low latency of less than one frame. Dual encoding engines with independent scalers enable simultaneous 4K/60 4:4:4 and 1080p streaming. The USB-C input carries video, audio and USB data on one cable and acts as the host port for USB transport. The HW-OMNI-E4521 is housed in a half-width rack enclosure and pairs with HW-OMNI-D4511 decoders for USB-extended BYOD AV over IP systems.

Applications

BYOD Conference Rooms

- Pair with HW-OMNI-D4511 decoders to extend USB-C BYOD connectivity — video, audio, and USB hub — from the presenter laptop to the display over the network.

Enterprise AV Distribution

- Encode 4K/60 HDMI sources with USB transport at centralized locations and stream over standard Gigabit Ethernet to any HW-OMNI decoder.

Higher Education & Lecture Capture

- Distribute lecture content from a single encoder to multiple classrooms, with USB connectivity for interactive devices at the podium.

Mission-Critical Environments

- Ultra-fast switching and AES-128 encryption ensure reliable, secure content delivery in government, military, and enterprise AV systems.

Key Features

- 4K/60 4:4:4 encode with VCx™ codec — artifact-free image quality and ultra-low latency (<1 frame).
- HDR support: HDR10, HLG, and Dolby® Vision™ at 60 Hz.
- USB-C input carries video, audio and USB data on one cable and acts as the USB host port; integrated USB 2.0 hub.

- Dual encoding engines — simultaneous 4K/60 4:4:4 (Encoder 1) and 1080p (Encoder 2) streams.
- Independent scalers: Encoder 1 up/down to 3840×2160 max; Encoder 2 up/down to 1920×1080 max.
- HDCP 2.2 compliant; AES-128 encrypted stream delivery.
- RS-232 and IR bidirectional control pass-through over the network.
- PoE+ (IEEE 802.3at) powered — no local AC required; optional 48V external supply.
- IEEE 802.1x network authentication; HTTPS, SSH, Telnet, WebSocket/TLS management.
- AES67-compatible audio; simultaneous OmniStream and AES67 streaming.
- Thumbnail preview of encoded streams (320×180px, 2-second update) for source monitoring.
- Pairs with HW-OMNI-D4511 for USB-extended BYOD AV over IP.
- NDAA Section 889 and TAA compliant.

Specifications

Video	
Signal	HDMI
Copy Protection	HDCP 2.2
UHD/HD/SD Resolutions	4K/60/50/30/25/24 Hz; 1080p; 1080i; 720p; 576p/i; 480p/i
VESA Resolutions	2560×1600, 1920×1200, 1920×1080 (and others) @ 60 Hz
Color Space	YUV, RGB
Encoding Density	Dual encoding engine with independent scalers
Compression Format	VCx
Video Quality Mode	User-selectable: PC Application or Video mode
Chroma Subsampling	4:4:4, 4:2:2, 4:2:0
Color Depth	8-bit, 10-bit, 12-bit
HDR Formats	HDR10, HLG, Dolby® Vision™
Max Bit Rate	Configurable up to 900 Mbps (shared between both engines)
Scaler — Encoder 1	Up and down, 3840×2160 max
Scaler — Encoder 2	Up and down, 1920×1080 max
Latency	<0.5 frame (e.g. < 8ms @ 1080p/60); <1.5 frames in Fast Switching mode
Thumbnail	1 per HDMI input; 320×180px JPG; 2-second update
Audio	
Pass-Through Formats	LPCM 2.0/5.1/7.1; Dolby® Digital, TrueHD, Atmos®; DTS®, DTS-HD
Down-Mixing	Multichannel LPCM to 2-channel LPCM
Sample Rate	32 kHz – 192 kHz
Bit Depth	Up to 24-bit
AES67	Supported; simultaneous OmniStream and AES67 streaming; up to LPCM 7.1
USB	
USB-C	Input; video, audio and USB data; USB host port for USB transport
USB Hub	Integrated USB 2.0 transport; 2 local device ports; switching between 2 host

	ports
Network & Protocols	
Video Streaming	RTP
Audio Streaming	RTP (up to 7.1 ch); AES67
Addressing	DHCP, Static
Encryption	AES-128
QoS	RFC 2475
Discovery	Multicast DNS, LLDP, SAP
Management	HTTPS, SSH, Telnet, WebSocket with TLS
Authentication	IEEE 802.1x: PEAP/MSCHAPv2 or EAP-TLS
IP Multicast	IGMPv2 and IGMPv3
Control	
RS-232	Device control and bidirectional pass-through; 2400–9600 baud
IR	Bidirectional pass-through from/to network
Connections	
HDMI Input	1 × Type A, 19-pin, female, locking
USB-C	1 × USB-C
USB Hub	Integrated USB 2.0
Ethernet	1 × RJ45, 10/100/1000 Mbps
RS-232 / IR	1 × Captive screw, 6-pin (RS-232 on port 1, IR on port 2)
Power	1 × Captive screw, 2-pin
Power	
PoE	IEEE 802.3at (PoE+)
Consumption	Up to 12 W (40.9 BTU/h)
External Power Supply (optional)	Input: 110–220V AC, 50/60 Hz; Output: 48V DC, 0.83A
Mechanical	
Dimensions (H × W × D)	1.34" × 8.19" × 4.41" (34mm × 208mm × 112mm)
Weight	1.5 lbs (0.7 kg)
Enclosure	Half-width rack; front-to-rear temperature-controlled airflow
Environmental	
Operating Temperature	14°F to 122°F (-10°C to +50°C)
Storage Temperature	-14°F to 140°F (-10°C to +60°C)
Humidity	20% to 95% RH, non-condensing
Max Operating Altitude	2000 meters
Regulatory	
Certifications	CE, FCC, CB, RoHS

Power Supply Certs	CE, FCC, cULus, CB, RCM, RoHS
NDAA Section 889	Compliant
TAA	Compliant
Warranty	See hallresearch.com/warranty