4K AV over IP Extender Matrix, Video Wall & Multiview System

Model: KH7000_lite

With APP Control & Real-Time Preview Functionality

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1. Introduction

The KH7000_lite is an all-in-one 4K HDMI over IP solution, integrating both **Encoder (Transmitter)** and **Decoder (Receiver)** functionalities in a single unit. Its operational role (encoder/decoder) can be flexibly switched via PC software, eliminating the need for separate transmitter/receiver hardware—reducing deployment costs while maximizing application versatility.

A front-panel OLED screen provides real-time visibility of critical device information (model name: KH7000_lite, device ID, IP address, and system status), simplifying on-site configuration and troubleshooting. The unit supports dual power supplies (DC 12V and PoE), enabling hassle-free installation in diverse environments such as conference rooms, digital signage systems, and control centers.

Core capabilities include 4K video transmission, matrix switching, video wall control, signal distribution, and multiview display (up to 16 windows per screen). It also supports audio embedding/de-embedding, keyboard/mouse (KVM) transmission, RTSP/ONVIF IP camera decoding, and customizable control interfaces—making it suitable for commercial, residential, and governmental applications.

2. Key Features

- **2-in-1 Encoder/Decoder**: Role switchable directly via PC software (no separate hardware required).
- **4K Visual Performance**: Up to 4K@30Hz input/output resolution, compliant with HDMI 1.4 and HDCP 1.4 standards.

- **Long-Distance Transmission**: Supports distances up to 150m using CAT6 (or higher) Ethernet cables.
- **Versatile Operating Modes**: Matrix Switching, Video Wall Control, Signal Distribution, and Multiview (16 windows/screen; no PIP/POP support).

Note: PIP = Picture-in-Picture, POP = Picture-out-Picture

- **Rich Functionalities**: Real-time signal preview, OSD (On-Screen Display), EDID management, and RTSP/ONVIF protocol support.
- **Dual Power Options**: DC 12V 1A (external adapter) or PoE (Power over Ethernet) for flexible installation.
- **Customizable Control Interface**: User-friendly UI customization to match specific operational needs.
- **Multiple Control Channels**: Windows PC software, Android/iOS mobile APP, and TCP/UDP commands (no external IP control box required).
- **Central Control Interfaces**: 1×RS232, 1×RS485, 1×Relay, and 1×I/O (phoenix-style connectors) for third-party device integration.
- **KVM & Audio Support**: Keyboard/mouse transmission (via USB) and 3.5mm analog audio in/out (or HDMI-embedded digital audio).

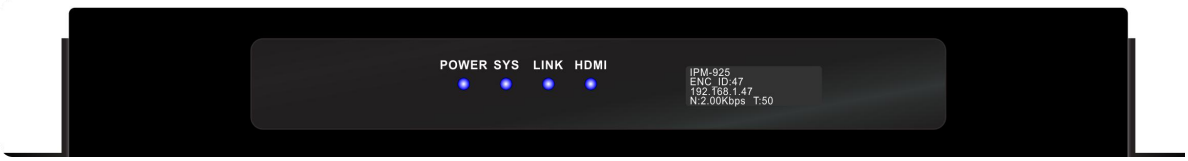
3. Technical Specifications

Category	Details
Video	- Standard: HDMI 1.4, HDCP 1.4- Max Resolution: 4K@30Hz (input/output)- Codec: H.264/H.265
Audio	- Analog: 3.5mm line-in/out- Digital: HDMI-embedded audio
Network	- Port: 1×RJ45 (PoE-compatible)- Bandwidth: Up to 20Mbps- IP Configuration: Static IP (manual setup required)- Working Mode: Multicast (requires 1Gbps Gigabit switch)
Latency	80~120ms (low-latency for real-time applications like live monitoring)
Control	- Windows PC management software- Android/iOS mobile APP- Third-party control via TCP/UDP commands
Physical	- Dimension (L×W×H): 175 × 110.5 × 25 mm - Weight: Approximately 300g

Power	- DC Input: 12V 1A (external adapter)- PoE: IEEE 802.3af compliant

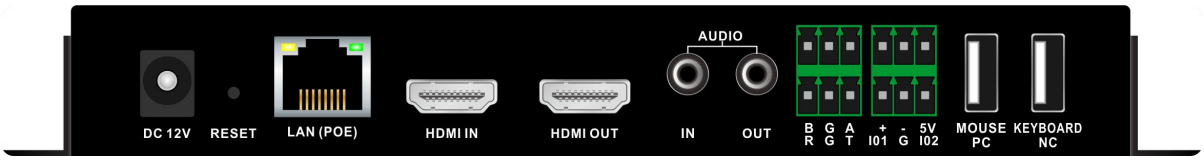
4. Panel Interfaces (Front & Rear)

4.1 Front Panel



Component	Function
Indicators	- PWR: Illuminates when power is connected- SYS: Flashes steadily during normal system operation- LINK: Illuminates when LAN cable is properly connected- HDMI: Illuminates when HDMI signal is detected
OLED Screen	Displays model (KH7000_lite), device ID, IP address, and operating status (encoder/decoder mode)
RESET Button	Resets the unit to factory default settings (press and hold for 5 seconds)

4.2 Rear Panel



Interface Type	Details
Video	1×Type-A HDMI Port (functions as input or output, based on encoder/decoder mode)
Control	- 1×RS232 phoenix-style connector- 1×RS485 phoenix-style connector- 1×Relay phoenix-style connector- 1×I/O phoenix-style connector
Audio	1×3.5mm audio input port, 1×3.5mm audio output port
Network	1×RJ45 Port (PoE-compatible, for LAN connection)

USB	2×USB-B Ports (for keyboard/mouse connection or PC host communication)
Power	1×DC 12V 1A Jack (for external power adapter)

5. Connection Diagrams & Application Modes

The KH7000_lite supports 4 core application modes. Use CAT6 (or higher) Ethernet cables for IP transmission and HDMI 1.4-compliant cables for video sources/displays.

5.1 Mode 1: Extender (1-to-1 Transmission)

Transmit 4K video/audio/KVM signals from one source to one display over 150m.

1. Configure one KH7000_lite unit as an **Encoder**: Connect it to an HDMI source (e.g., desktop PC, Blu-ray player, or media server) via an HDMI cable.
2. Configure a second KH7000_lite unit as a **Decoder**: Connect it to a display device (e.g., monitor, TV, or projector) via an HDMI cable.
3. Link the Encoder and Decoder using a CAT6 (or higher) Ethernet cable.
4. (Optional) Connect a USB cable for KVM functionality and a 3.5mm audio cable for analog audio transmission.
5. Power both units via DC 12V adapter or PoE.

5.2 Mode 2: Distribution (1-to-Many Transmission)

Send one source signal to multiple displays simultaneously.

1. Configure one KH7000_lite unit as an **Encoder**: Connect it to the target HDMI source.
2. Connect the Encoder to a 1Gbps Gigabit PoE switch using a CAT6 (or higher) Ethernet cable.
3. Configure multiple KH7000_lite units as **Decoders**: For each Decoder, connect it to a display (via HDMI) and to the same Gigabit switch (via CAT6 cable).
4. Power the Decoders via PoE (from the switch) or DC 12V adapter.

5.3 Mode 3: Matrix Switcher (Many-to-Many Transmission)

Switch between multiple sources and route signals to specific displays.

1. Connect all HDMI sources (e.g., PCs, IP cameras, or media players) to KH7000_lite units configured as **Encoders**.
2. Connect all target displays to KH7000_lite units configured as **Decoders**.
3. Link all Encoders and Decoders to a 1Gbps Gigabit PoE switch using CAT6 (or higher) Ethernet cables.

4. Use the PC software or mobile APP to switch sources to specific displays in real time.

5.4 Mode 4: Video Wall & Multiviewer

Create video walls (e.g., 2×2, 3×3) or display up to 16 sources on one screen.

1. Connect all HDMI sources to Encoders (KH7000_lite units) and link the Encoders to a 1Gbps Gigabit switch.
2. For **Video Wall**:
    - Configure Decoders (KH7000_lite units) to "Video Wall Mode" via software.
    - Assign each Decoder to a specific display position (e.g., Top-Left, Top-Right, Bottom-Left, Bottom-Right).
    - Connect each Decoder to its corresponding display via HDMI.
1. For **Multiview**:
    - Configure one Decoder to "Multiview Mode" via software.
    - Select up to 16 source signals to display.
    - Connect the Decoder to a single display via HDMI.

6. Control Methods

6.1 Software Control (Windows PC)

1. Download and install the dedicated KH7000_lite management software from the manufacturer’s official website.
2. Connect the PC to the same network as the KH7000_lite units.
3. Launch the software: It will automatically detect all connected KH7000_lite devices.
4. Supported Functions:
    - Switch the unit’s role (encoder/decoder).
    - Configure IP addresses, EDID settings, and OSD parameters.
    - Manage matrix switching, video wall layouts, and multiview window arrangements.
    - Preview all source signals in real time.

6.2 Mobile APP Control (Android/iOS)

1. Download the "KH7000_lite Control" APP from Google Play (Android) or the App Store (iOS).
2. Connect your mobile device to the same network as the KH7000_lite units.
3. Log in to the APP and select the target KH7000_lite device:
    - Basic Control: Source switching, volume adjustment.

- Advanced Control: Video wall layout editing, multiview source selection.

6.3 Third-Party Control (TCP/UDP Commands)

Integrate the KH7000_lite with third-party control systems (e.g., Crestron, AMX) using TCP or UDP commands. For detailed command syntax, refer to the separate "KH7000_lite Command Protocol Guide" (available from the manufacturer).