



IPVDS-700-ED

4K HDMI IP Video Wall Controller

User Manual



Doc No. : OIPVDS-180730EN / Rev1.0

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1. Product Description

IPVDS-700-ED, 4K HDMI IP Video Wall Controller, is an integrated control solution that enable to play multi-source of audio/video (such as PC, Media Player, DVD and Blu-ray) on the video wall system and multiple individual displays simultaneously.

This solution provides advanced audio/video matrix feature as well as control of video wall system which divide high quality video source (4K 30Hz or 1080p 60Hz) into multiple video walls with using IPVDS-700-E (Encoder) and IPVDS-700-D (Decoder). It enables convenient system configuration and control for AV System Integrator and Installer, and it also gives cost-efficiency compared to complicated matrix system. For these reasons, IPVDS-700-ED provides optimal solution not only to large video wall system like control room, security, traffic control facility, but also to general venues like conference room, classroom, presentation room, and worship facility.

Program provided for system control offers preview function of source video as well as various display configurations like merging, overlaying, clearing, of displays with allocating audio/video sources with simple drag and drop operation of mouse.

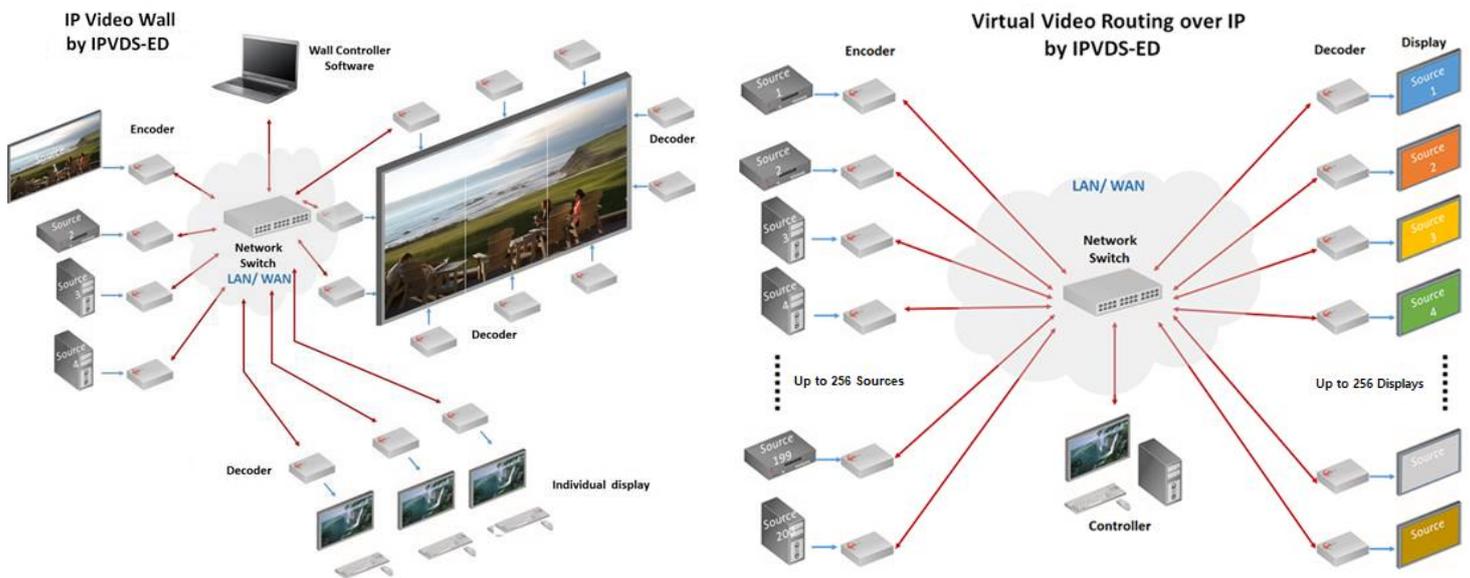


Figure 1. Connection Diagram

1.1 Main Features

- TCP/IP base IP network: Gigabit Ethernet
- Support up to 4K (3840x2160@30Hz 4:4:4 or 3840x2160@60Hz 4:2:0) input resolution
- Support up to 4K (3840x2160@30Hz 4:4:4) output resolution
- Supports Analog/HDMI audio input and output
- Fast switching time / low video latency
- Transmits HDMI/DVI video, audio, USB, RS-232, IR signal over IP network
- Provides HDMI loop-thru port for local display (Up to 4K 60Hz 4:2:0)
- Provides merge, overlay and split function on multiple video wall layout of PC program
- Supports up to 256 displays (16x16 - 4x64 - 1x256) video wall and multi-sources
- Supports M:N virtual matrix
- Supports 802.3af standard PoE (Power-over-Ethernet)
- Provides 5V/2A power adapter (Optional)
- Provides mounting bracket (model: OPSCB): VESA 75,100 standard (optional)
- Provides 1U rack (4 devices in 1 rack) & Power rack (PR5V-16: 16* 5V output) (optional)

1.2 IPVDS-700 Control PC Application

- PC application for controlling video wall and individual displays
- Provides drag and drop operation for host allocation
- Provides allocate, merge, split, overlay function on the layout management
- Provides preview screen before applying it to actual displays
- Provides up to 99 pre-sets for the user defined layout (save/load)
- Pre-set scheduling function: Sequential mode (dwell time based)
- Weekly mode (hourly/weekly based)
- Bezel compensation in 0.1mm

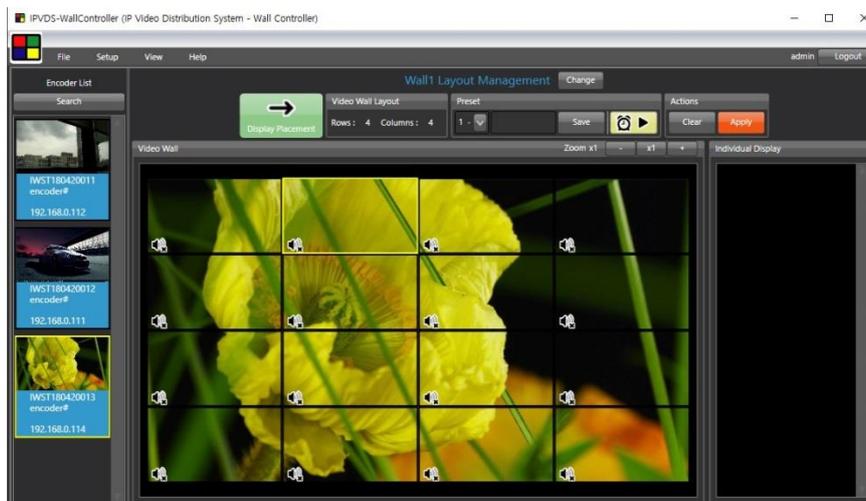


Figure 2. Software Main Screen

Note. Refer to IPVDS-Wall Controller manual for PC application manual

2. Shipping Group



IPVDS-700-ED



HDMI cable 1.2m



Mini-USB cable



HDMI fixing screw

2.1 General Items

- IPVDS-700-E Encoder
 - One (1) HDMI male to male cable (1.2m).
 - One (1) Mini-USB Cable for PC.
 - HDMI cable fixing screw, 3-pin terminal block (male)
- IPVDS-700-D Decoder
 - One (1) HDMI male to male cable (1.2m).
 - HDMI cable fixing screw, 3-pin terminal block(male)

2.2 Optional Items

- RS-232 cable: DB-9 male to 3-pin terminal block.
- AC / DC power adaptor: One (1) unit of 5V / 2A.



- Mounting bracket: OPSCB complying with VESA 75, 100 standard



- 1U rack (4 in 1 rack).



- power rack (PR5V-16, 16*5V output).



3. System Requirement

3.1 Hardware Requirement

- Video source with HDMI output
- Display with HDMI input
- USB 2.0 port to use HID and USB storage feature
- No other special requirement for memory size, CPU speed or chipset

3.2 Software Requirement

- No special requirement

3.3 Network Requirement

- L2/L3 Gigabit management Ethernet switch is required for video matrix application.
- To apply correct operation, below features are required for L2/L3 gigabit management Ethernet switch.
 - 1) Gigabit Ethernet
 - 2) Jumbo frame (8K or more)
 - 3) L3 : IGMP and multicasting protocol
 - 4) L2 : IGMP snooping

Note: With satisfaction of above requirement, certain network switch might not transmit audio/video signal due to their performance.

- For bandwidth design, network topology and selection/setup of L2/L3 network switch, visit Opticis website (www.opticis.com) or contact techsupp@opticis.com .

3.4 Control PC Requirement

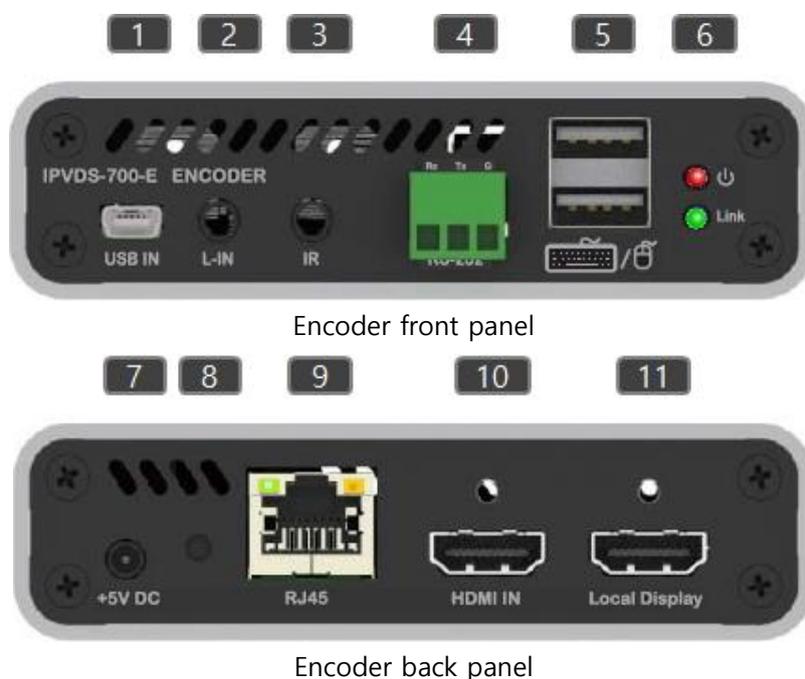
- OS version check for IPVDS-Wallcontroller program
- Requirement: Windows7 or higher

3.5 Power Requirement

- IPVDS-700-ED supports **802.3af standard PoE (Power-over-Ethernet)** and requires support of 802.3af/802.3at Type 1 of network switch.
- IPVDS-700-ED is designed to give priority to power adapter when connecting external +5V AC/DC power adapter.

4. External Description

4.1 IPVDS-700-E (Encoder)



ID	Name	Description
1	USB IN	Connection with PC USB port for Keyboard/Mouse use (HID)
2	L-IN	Line input port. Connection with line out audio
3	IR (TBD)	External IR cable port. IR Tx/Rx (Mode selection). Function: * IR over IP, ** IR Guest Mode. (TBD)
4	RS-232	RS-232 control port
5	USB	Local keyboard/mouse connection. (support F/W Upgrade)
6	Power LED	'Flashing' Booting and initializing status 'ON' Completion of booting, operating status 'OFF' Power OFF.
	Link LED	'Flashing' Ready status (Network connected), waiting for source 'ON' Network link connection status of encoder and decoder 'OFF' Network link disconnection status of encoder and decoder
7	+5V DC	5V DC power input. 5V/2A, 3.5x1.35mm adapter connection Higher priority than PoE, PoE won't operate when using adapter
8	RESET	'Short push' Re-booting 'Long push' Factory reset when pushing more than 3 seconds
9	RJ45	LAN port. Supports 100Base-T, 802.3af PoE
10	HDMI IN	HDMI input. Standard embedded UHD EDID
11	Local Display	HDMI output. Output HDMI IN input signal

4.2 IPVDS-700-D Decoder



ID	Name	Description
1	L-OUT	Line output port. Connection with line-in audio
2	IR (TBD)	External IR cable port. IR Tx/Rx (Mode selection). Function: * IR over IP, ** IR Guest Mode. (TBD)
3	RS-232	RS-232 control port
4	USB	Local keyboard/mouse connection. (support F/W Upgrade)
5	Power LED	'Flashing' Booting and initializing status 'ON' Completion of booting, operating status 'OFF' Power OFF.
	Link LED	'Flashing' Ready status (Network connected), waiting for source 'ON' Network link connection status of encoder and decoder 'OFF' Network link disconnection status of encoder and decoder
6	+5V DC	5V DC power input. 5V/2A, 3.5x1.35mm adapter connection Higher priority than PoE, PoE won't operate when using adapter
7	RESET	'Short push' Re-booting 'Long push' Factory reset when pushing more than 3 seconds
8	RJ45	LAN port. Supports 1000Base-T, 802.3af PoE
9	HDMI OUT	HDMI output.

5. Feature Description

5.1 Video over IP

IPVDS-700-ED provides matrix and video wall feature with multi-cast connection and IPVDS-Wallcontroller program or API can be provided for this. Each encoder and decoder requires to be assigned their own IP address, and each encoder can be connected to single/multiple decoder(s).

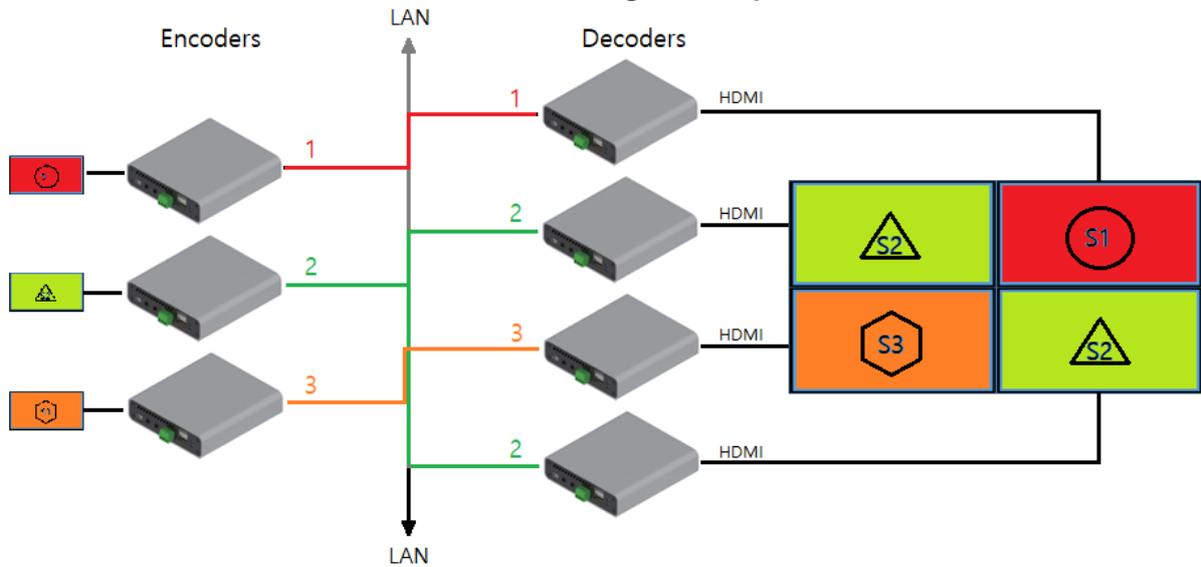


Figure 3. KVM Matrix

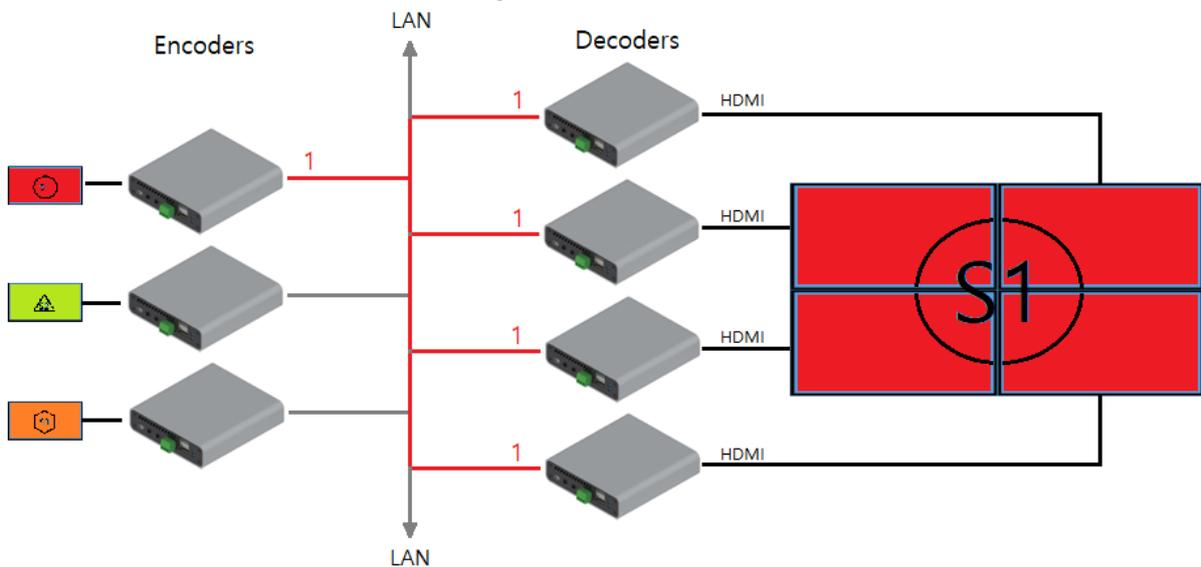


Figure 4. Video Wall

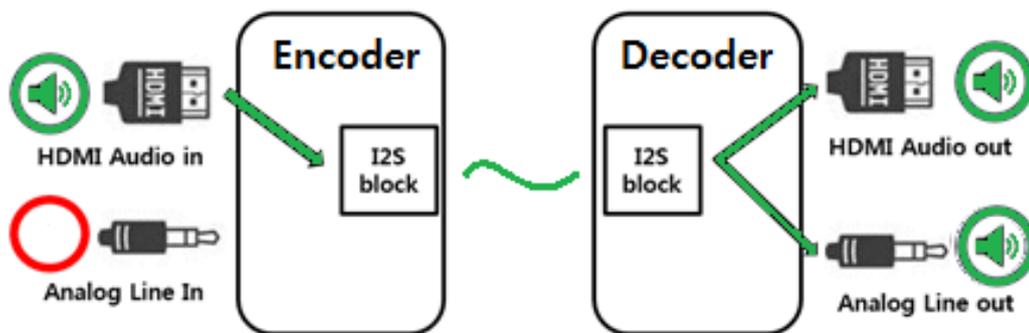
Note 1. Fast switching operates when resolution and mode of encoders are all same.

Note 2. Decoder can get connected to one encoder concurrently.

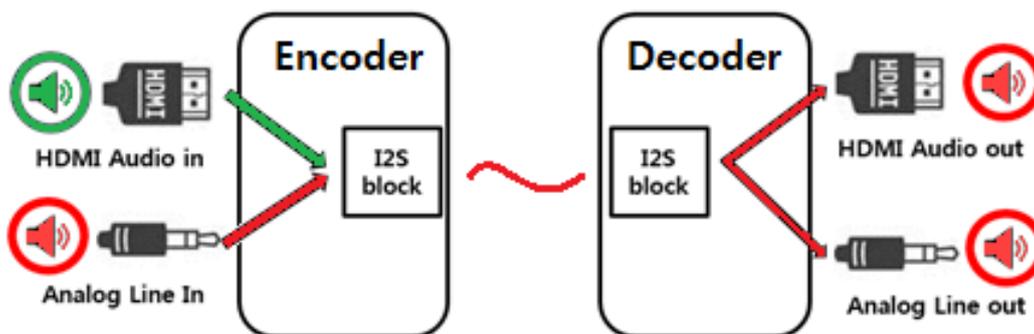
5.2 Audio over IP

IPVDS-700-E supports audio input of both HDMI Audio and Analog Line In. HDMI/Analog Line In audio will be delivered to decoder by Hot-plug of Analog Line In port. IPVDS-700-D will output delivered audio from encoder through HDMI and Analog Line Out simultaneously.

Analog Line In audio gets priority when receiving both HDMI audio and Analog Line In input. When both audio channels get connected, encoder will only deliver Analog Line In audio to the decoder, and HDMI audio will not be delivered.



HDMI Audio connected, Analog Line In disconnected



Both HDMI Audio and Analog Line In connected

Figure 5. Audio over IP

5.3 USB over IP

IPVDS-700-ED offers USB Virtual Hub feature which makes USB device connected on decoder (remote site) operates on PC connected with encoder.

- Supporting devices: HID, storage and more
- Concurrent connection: 1 encoder x N Decoder \leq 5 USB devices

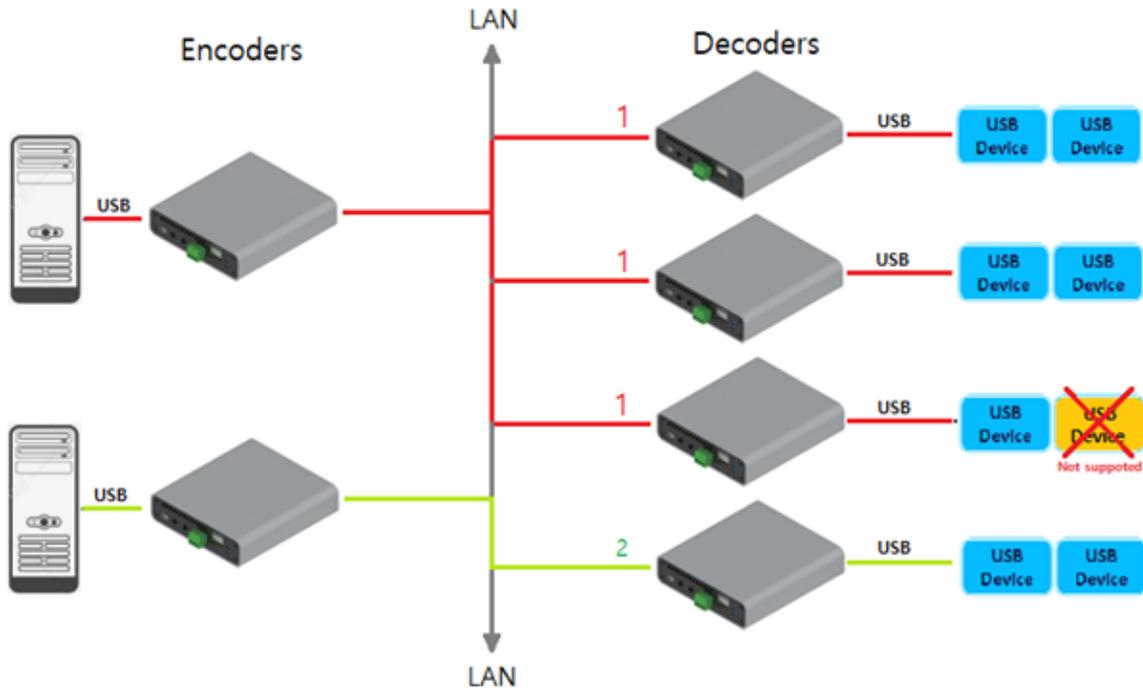


Figure 6. USB over IP

5.4 RS232 over IP

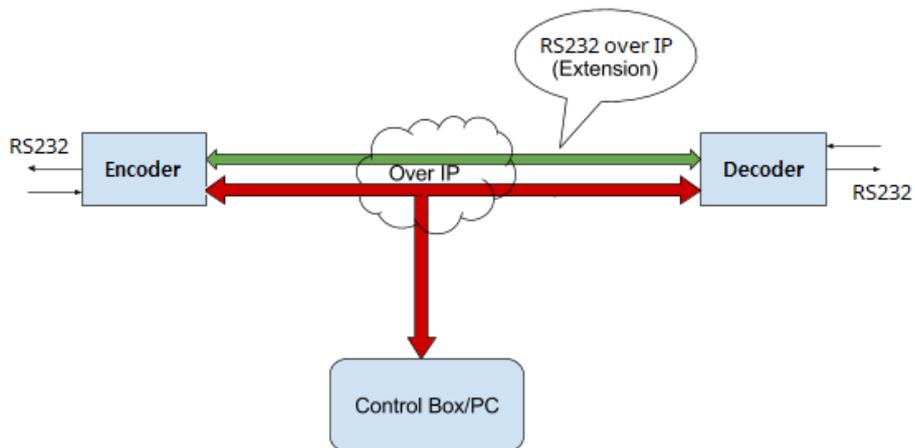


Figure 7. RS232 over IP

RS232 over IP: RS-232 signal transmission between encoder ↔ decoder

(default is 115200-8n1)

RS232 Guest Mode: Manage RS-232 input/output signal from encoder/decoder on control PC

5.5 IR over IP / IR Guest mode (TBD)

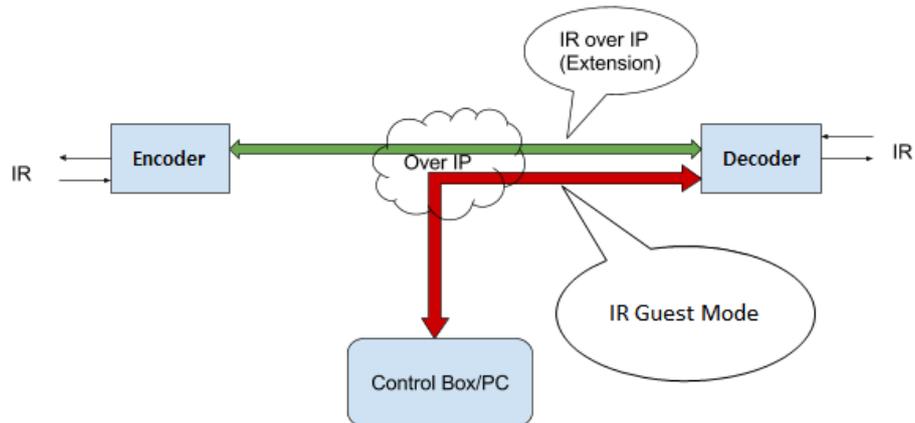


Figure 8. IR over IP

IR over IP: IR signal transmission between encoder ↔ decoder

IR Guest Mode: Manage IR input/output signal from control PC

5.6 Supported Resolution

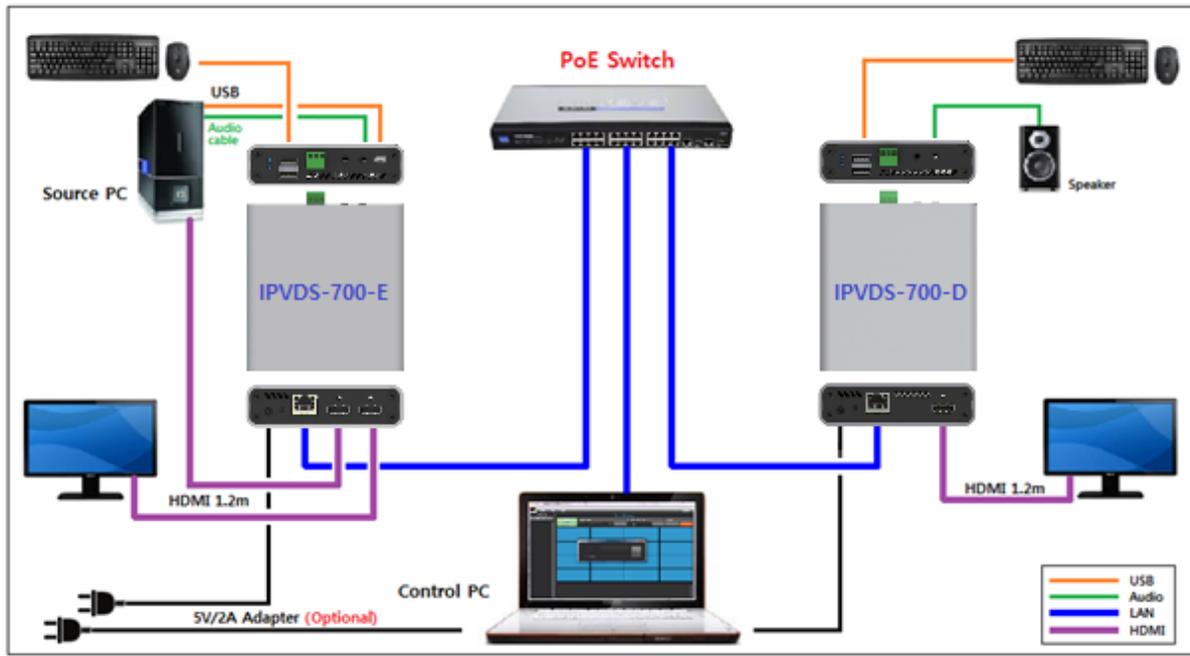
Spec	Support
Interlace mode	O
HDMI 1.4b up to 1080p	O
HDMI 1.4b 2160p 30Hz	O
HDMI 1.4b 3D	O
HDMI 1.4b deep color	O
HDMI 2.0a 2160p 60Hz	O Note. 1 Only 2160p 60Hz YUV420 input Note. 2 Will do horizontal half down scale and convert 2160p 60Hz YUV420 input to 2160p 30Hz output
VESA DVI up to 1920x1200 60Hz Pixel clock < 165MHz	O
VESA VGA up to 1920x1200 60Hz Pixel clock < 150MHz	O
Maximum Frame Rate	full frame rate up to 60fps

5.7 Supported Audio Format

Audio Format	Support
Dolby Digital 5.1 ch	0
Dolby Digital Plus	0
Dolby TrueHD	0
DTS 5.1 ch	0
DTS-HD High Resolution Audio	0
DTS-HD Master Audio	0
Linear PCM 2 ch 44.1/88.2/176.4/32/48/96/192 kHz	0
Linear PCM 5.1 ch 44.1/88.2/176.4/32/48/96/192 kHz	0
Linear PCM 7.1 ch 44.1/88.2/176.4/32/48/96/192 kHz	0

6. Installation

6.1 Hardware Installation Procedure



Important: Follow below steps for installation procedure. If not installed properly, malfunction could happen.

Step 1

Unpack the package.

Step 2

Turn on PC, display, network switch (L2/L3).

Step 3

Turn on the PC for IPVDS-Wallcontroller program and connect LAN cable (Cat5e/CAT6) to the network switch.

Step 4

Connect HDMI cable from display source to HDMI IN port of IPVDS-700-E (Encoder).

Step 5 (optional)

Connect enclosed USB cable from PC to USB port of IPVDS-700-E (Encoder). This step can be skipped if not using local/remote control of keyboard and mouse.

Step 6 (optional)

Connect HDMI cable from IPVDS-700-E loop-thru port to local HDMI display.

Step 7

Connect LAN cable (CAT5e/6) from IPVDS-700-E (encoder) to RJ45 port of network switch.

Step 8

Connect HDMI cable from IPVDS-700-D (decoder) HDMI OUT port to Display.

(Connect keyboard and mouse for remote control.)

Important: IPVDS-700-D has to be connected to each of video wall displays in order.
Refer to display placement section for more detailed information.

Step 9

Connect LAN cable (CAT5e/6) from IPVDS-700-D (decoder) to network switch.

Step 10 (optional for non-PoE network switch user)

Plug +5V power adapters to both IPVDS-700-E (encoder) and IPVDS-700-D (decoder).

Note: When using, PoE supported network switch, ignore step 10.

6.2 Reset and Factory Reset

- ◆ **Reset** (short key): Device will reboot when pressing reset button shortly.
- ◆ **Factory Reset** (Long key): Press and hold reset button for approximately 5 seconds, then LED of device will be flashing for factory reset. It will reboot automatically after factory reset.

Note: Do not unplug LAN cable (when using PoE network switch), or power adapter while running factory setting

7. Product Specification

	Description	
Network	TCP/IP based IP network: 1000 Base-T Ethernet with CAT5e/CAT6	
Network media	* UTP CAT5e, 6 cable Max 100m	
Jumbo Frame	8,000	
Input Resolution	Max 3840x2160@30Hz 4:4:4 or 3840x2160@60Hz YCbCr4:2:0	
Output Resolution	Max 3840x2160@30Hz 4:4:4	
Video Wall	Up to 256 (16x16, 4x64, 1x256, etc.) Video Wall with multi-sources	
Virtual IP Matrix	Supports Rows by Columns Virtual Matrix with individual displays	
Multicast streaming	1 to N (up to 256 RXs)	
Video Interface	HDMI 1.4 and DVI 1.0	
HDCP	HDCP 1.4 and 2.2	
Video latency	< 1 frame	
Fast switching	< 2 seconds	
Data rate (changeable)	50, 100, 150, 200Mbps(default) and Best	
Video Interface	IPVDS-700-E	Input: 1 HDMI Input Output: 1 HDMI Output
	IPVDS-700-D	Output: 1 HDMI Output
Analog Audio Interface	IPVDS-700-E	LINE IN 1 port
	IPVDS-700-D	LINE OUT 1 port
USB	IPVDS-700-E	Host: 2 x USB A type Client:1 x mini USB B type
	IPVDS-700-D	Host: 2 x USB A type
IR (TBD)	IR Tx/Rx (Mode select)	
RS-232	3 Pin Terminal block for Control Authority (Externally)	
EDID	Built-in EDID & EDID Read/Write (decoder read only)	
Dimension	112 x 28 x 104mm (WHD)	
Power	PoE : IEEE 802.3af(15.4W). * option: Adapter 5V/2A	
Power Consumption	TX < 6W	RX < 5W
Operating Temperature	0 ~ 50°C	
Storage Temperature	-20 ~ 60°C	
Certification	FCC, CE, KC	

- When using PoE feature, maximum transmission length over LAN cable can decrease.
(ex: LSIS CAT5e UTP single wire: 90~100m)

8. Warranty

1 (One) Year Warranty

Opticis warrants IPVDS-700-ED, HDMI IP Video Wall controller to be free from defects in workmanship and material, under normal use and service, for a period of one(1) year from the date of purchase from Opticis or authorized resellers.

To request repair or service from Opticis, customer shall not open the product, nor place any part of IPVDS-700 without assistance from Opticis. Keep serial number sticker on the device.

Opticis has no responsibility for any software, firmware, information or memory data of customer contained in, stored on, or integrated with any returned to Opticis for repair

(Under warranty or not)

1. Free Repair

- Faulty IPVDS-700 under normal use in warranty in period

2. Customer Paid Repair

- Faulty IPVDS-700 but out of warranty period
- Faulty caused by negligence and/or intention of customer
- Faulty caused by voluntary alternation or repair without approval from Opticis
- Faulty caused by natural calamities
- Faulty caused by connection with other faulty device

If a product does not work as warranted during applicable warranty period, Opticis shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item refund to purchase price for the defective product.

All products that are replaced will become the property of Opticis. Replacement products may be new or reconditioned.

Dispose of Old Electrical & Electronic Equipment

(Applicable in the European Union and other European countries with separate systems)



This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



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