

UNITY IPX TA-IPX5102-E

HDMI 2.0 A/V over IP Encoder



User Manual

VER 1.1

Important Safety Instructions



1. Do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.



6. Clean this apparatus only with dry cloth.



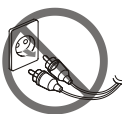
2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.



7. Unplug this apparatus during lightning storms or when unused for long periods of time.



3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.



8. Protect the power cord from being walked on or pinched particularly at plugs.



4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



9. Only use attachments / accessories specified by the manufacturer.



5. Do not place sources of naked flames, such as lighted candles, on the unit.



10. Refer all servicing to qualified service personnel.

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Introduction

Overview

The IPE5102 series encoders are designed to work with IP5100 series decoders for UHD media up to 3840 x 2160@60Hz 4:4:4 to be switched and distributed over standard Gigabit Ethernet networks, providing complete end-to-end streaming systems, where audio, video together with USB, RS232 and IR signals can be routed separately or as a whole. Equipped with Dante technology, they can realize perfect interconnectivity and interoperability with Dante audio systems.

Triple Ethernet ports are equipped. HDCP 2.2/2.3 specifications are employed. A local area network is covered with a range up to 330ft (100m) over a single Cat 5e cable or above. Standard features like bidirectional serial, bidirectional IR, and independent analog audio input/output are included. Control methods of telnet API and SC010 controller are provided. The IPE5102 series encoders are ideal for any low latency and signal routing applications, such as homes, classrooms, conference rooms, sport bars, auditoriums, etc.

Features

- Includes one HDMI and one USB-C inputs with support of flexible input switching modes: Auto, Manual and Priority.
- Built-in triple Ethernet ports, any one of which can be used for transmission of A/V streams, control data and Dante audio streams.
- Supports input and output resolutions up to 3840 x 2160@60Hz 4:4:4.
- Supports HDR10 and Dolby Vision.
- Supports CEC.
- Supports multi-channel audio up to PCM 7.1, Dolby Atmos, DTS HD

Master and DTS:X.

- Configurable audio input/output direction.
- HDMI eARC audio return.
- HDCP 2.2/2.3 compliant.
- Flexible routing policies, allowing audio, video, USB, RS232 and IR signals to be routed separately or as a whole throughout the matrix system.
- Delivers audio, video, USB, RS232, IR and power signals up to 328ft/100m over a single Cat 5e cable or above.
- Supports bidirectional serial communication.
- Supports bidirectional IR pass-through for controlling remote source and display devices between encoders and decoders.
- Supports IR generation: IR codes can be sent through API.
- Supports point-to-point, point-to-multipoint, multipoint-to-point, multipoint-to-multipoint applications.
- Supports PoE to be remotely powered by compatible power source equipment such as a PoE-enabled Ethernet switch, eliminating the need for a nearby power outlet.
- Supports DHCP by default, and will fall back to Auto-IP if there's no DHCP server in the system.
- Controlled by Telnet API and IP controller.
- Supports communications protocols of Telnet, SSH, HTTP, and HTTPS.
- Supports 2 x 2 Dante audio transmission when Dante licensed (default setting: Dante unlicensed).

Package Contents

- 1 x Encoder
- 1 x 3.5mm 3-Pin Phoenix Male Connector
- 1 x IR Emitter (3.94ft/1.2m)
- 1 x Broadband IR Receiver (3.28ft/1.0m, 30-50kHz)
- 4 x Mounting Brackets
- 4 x Screws

Specifications

Video	
Input Video Port	1 x USB-C; 1 x HDMI Type A (19 pins)
Input Video Type	HDMI 2.0, HDCP 2.2/2.3
Input Resolutions	3840 x 2160p@24/25/30/50/60Hz 4:4:4, 1920 x 1200@50/60Hz, 2400x1350p@60Hz, 1920 x 1080p@24/25/30/50/60/100/120Hz, 1920 x 1080i@50/60Hz, 1680 x 1050@60Hz, 1600 x 1200@60Hz, 1600 x 900@60Hz, 1400 x 1050@60Hz, 1440 x 900@60Hz, 1366 x 768@60Hz, 1360 x 768@60Hz, 1280 x 1024@60Hz, 1280 x 960@60Hz, 1280 x 800@60Hz, 1280 x 768@60Hz, 1280 x 720p@60/100/120Hz, 1024 x 768@60Hz, 800 x 600@60Hz, 720 x 576p@50Hz, 720 x 480p@60Hz, 640 x 480p@60Hz
Output Video Port	2 x RJ-45; 1 x Optical; 1 x HDMI Type A (19 pins)
Output Video Type	IP Stream; HDMI 2.0, HDCP 2.2/2.3
Output Resolutions	Up to 3840 x 2160p@60Hz 4:4:4
Average Encoding Data Rate	3840 x 2160@60Hz: 650Mbps (avg) / 900Mbps (max)
Input/Output Video Signal	0.5~1.2 V p-p
Input/Output DDC Signal	5 V p-p (TTL)
Video Impedence	100 Ω
Maximum Data Rate	18 Gbps (6 Gbps per color)
Maximum Pixel Clock	600 MHz

Audio	
Input Audio Port	1 x USB-C; 1 x HDMI Type-A; 1 x 3.5mm stereo jack (configurable)
Input Audio Signal	• HDMI/USB-C IN: Fully supports audio formats in HDMI 2.0 specification, including PCM 2.0/5.1/7.1,

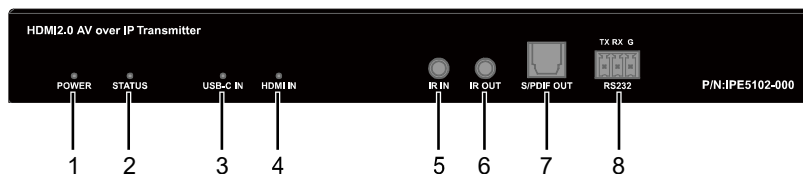
Audio	
	Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X AUDIO IN: Analog
Output Audio Port	2 x RJ-45; 1 x Optical; 1 x HDMI; 1 x S/PDIF Out; 1 x 3.5mm stereo jack (configurable)
Output Audio Signal	- LAN/HDMI: Fully supports audio formats in HDMI 2.0 specification, including PCM 2.0/5.1/7.1, Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X - S/PDIF Out: Digital audio - AUDIO OUT: Analog
Dante Audio Type	LPCM 2.0, 44.1/48/88.2/96 KHz

Control	
Control Method	Telnet API, IP Controller

General	
Operating Temperature/ Humidity	32°F ~ 113°F (0°C ~ 45°C), 10% ~ 90%, non-condensing
Storage Temperature/ Humidity	-4°F ~ 158°F (-20°C ~ 70°C), 10% ~ 90%, non-condensing
Power	20V DC 6A; PoE
Power Consumption (Max)	73W (with 60W charging included)
ESD Protection	Human body model: ±8kV (air-gap discharge) / ±4kV (contact discharge)
Dimensions (W x H x D)	8.46" x 0.98" x 6.30" (215 mm x 25 mm x 160 mm)
Net Weight	2.22lbs (1.01kg)

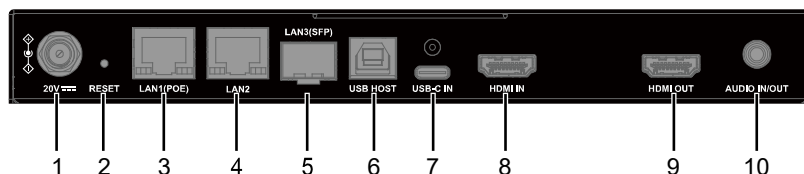
Panel Description

Front Panel



#	Name	Description
1	POWER LED	- On: The device is powered on. - Blinking: The device is booting. - Off: The device is powered off.
2	STATUS LED	- On: The device is working properly. - Blinking: The device is connected to the network but doesn't detect valid signal input. - Blinking slowly: The device is being upgraded. - Blinking quickly: Find me function is activated through telnet API for positioning a certain device. For more information refer to the separate API document. - Off: The device is not connected to the network.
3	USB-C IN	- On: The corresponding input channel is selected and connected to a valid input source. - Blinking: The corresponding input channel is selected and connected to an invalid source. - Off: The corresponding input channel is not selected. / The corresponding input channel is selected but not connected to a source.
4	HDMI IN	
5	IR IN	Connect this 3.5mm TRS jack to an IR receiver for IR communication with an IR emitter at the decoder side on the network.
6	IR OUT	Connect this 3.5mm TS jack to an IR emitter that is with 5V output for IR communication with an IR receiver at the decoder side on the network.
7	S/PDIF OUT	Connect this optical S/PDIF connector to an audio receiver for digital audio output.
8	RS-232	Connect this 3-pin 3.5mm phoenix connector to an RS232 device for bidirectional serial communication.

Rear Panel



#	Name	Description
1	20V	DC 20V power connector. Connect to a DC 20V 6A power adapter for power input.
2	RESET	When the device is powered on, use a pointed stylus to press and hold the RESET button for five or more seconds, and then release it, it will reboot and restore to its factory defaults. Note: When the settings are restored, your custom data is lost. Therefore, exercise caution when using the RESET button.
3	LAN1 (POE)	By default, any one of LAN1 (POE), LAN 2 and LAN3 (SFP) ports can be connected to an Ethernet switch for transmission of A/V streams, Dante audio streams and control data. For LAN1 (POE): - Supports PoE. For LAN2: - When LAN2 is configured as an <u>independent Dante port</u>**, it is for transmission of Dante audio streams, and LAN1 (POE) / LAN3 (SFP) is for transmission of A/V streams and control data. Tip: **This configuration can be implemented through the SC010 controller. For more information, refer to the controller's Web UI configuration guide. For LAN3 (SFP): - Connect this optical port to a Gigabit Ethernet switch using a single-mode or multi-mode SFP module. - SFP module is not included in the package. - The signal transmission distance may vary by specifications of the SFP module you use. IMPORTANT:  Make sure that you connect only one Ethernet port of LAN1 (POE), LAN2 and LAN3 (SFP) ports to the Ethernet switch, or device exceptions may occur.
4	LAN2	
5	LAN3 (SFP)	
6	USB HOST	Connect the USB-B port to a computer for USB 2.0 transmission.
7	USB-C IN	Connect the USB-C port to a USB-C source. This port

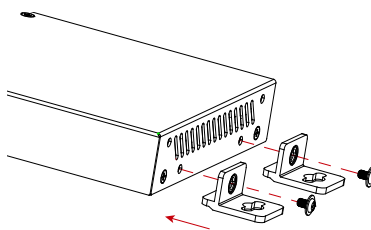
#	Name	Description
		supports transmission of DP 1.3, HDMI 2.0 and USB 2.0, plus 60W charging. Tip: Charging of the attached peripheral is available only if this device is powered by DC power instead of by PoE.
8	HDMI IN	19-Pin HDMI Type-A port. Connect to an HDMI source. This port supports HDMI 2.0b, HDCP 2.3 and bandwidth to the maximum of 18G.
9	HDMI OUT	19-Pin HDMI Type-A connector. Connect to an HDMI display.
10	AUDIO IN/OUT	3.5mm TRS port for unbalanced stereo input or output. This port can be configured as AUDIO IN or AUDIO OUT through API commands. - AUDIO IN: Connect to an audio source for audio input. - AUDIO OUT: Connect to an audio receiver for audio output. Default setting: AUDIO OUT

Bracket Installation

Note: Before installation, ensure the device is disconnected from the power source.

Steps to install the device on a suitable location:

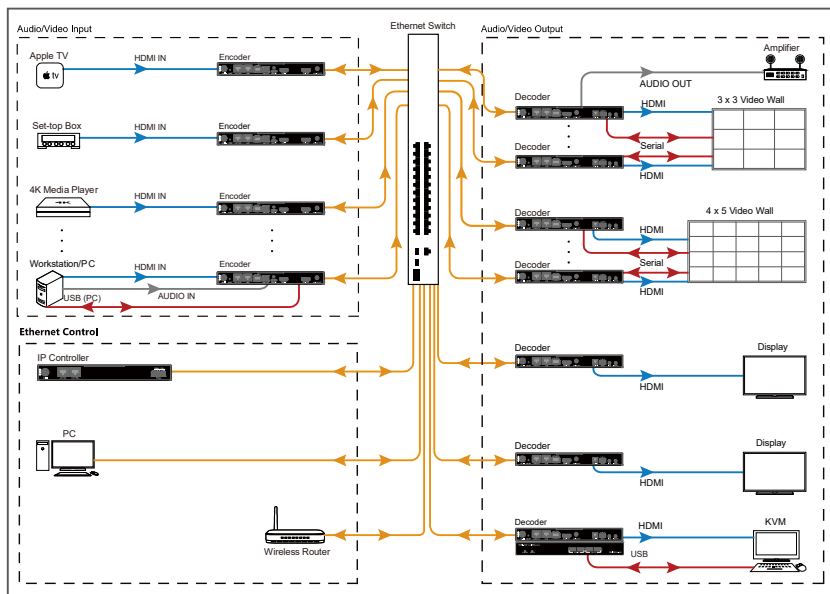
1. Attach the mounting brackets to the panels of both sides using the screws (two on each side) provided in the package.



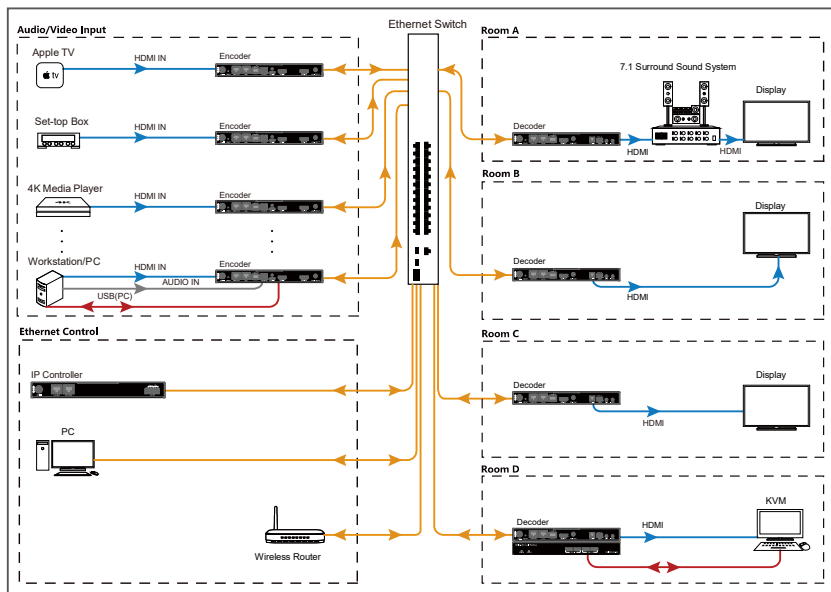
2. Install the brackets on the position as desired using screws (not included).

Typical Applications

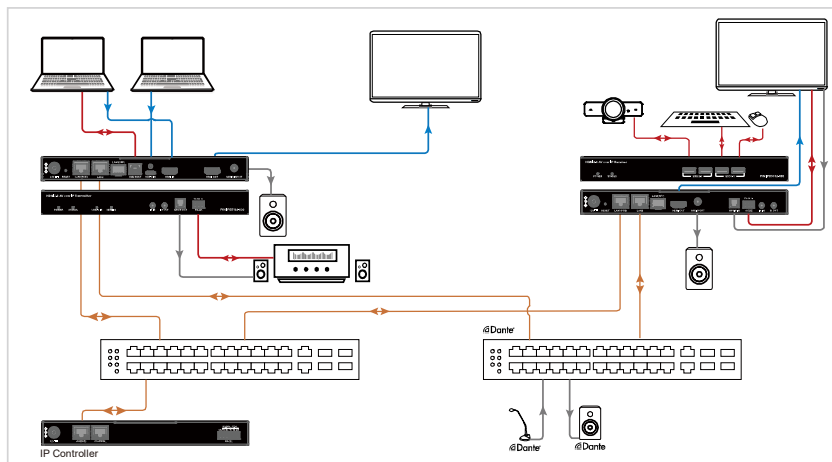
Application 1



Application 2

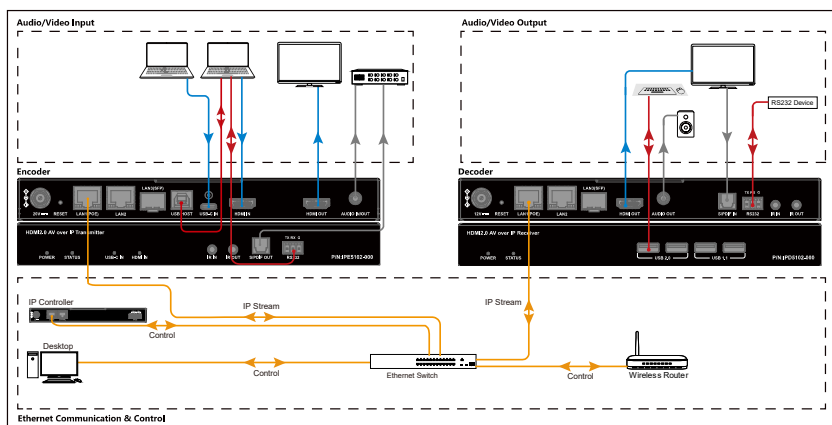


Application 3: Dual Ethernet Ports for Exclusive Dante Network



LAN1 (POE) / LAN3 port is for transmission of A/V streams and control data; LAN2 is for transmission of Dante audio streams which is routed to a standalone network. Two Ethernet ports are connected to different networks.

Hardware Installation



Note: If the Ethernet switch doesn't support PoE, connect encoders and decoders to their power adapters.

IP Address Identification

Default IP setting for the device is DHCP. Ensure there's a DHCP server in the network so that the device can obtain a valid IP address when you deploy the system. If there's no available DHCP server, e.g. the device is connected to a laptop directly, the device gets a default IP address in the range of 169.254.X.Y. The allocated IP address can be identified through API Commands.

Input Switching Mode

The device provides three modes for input switching between USB-C IN and HDMI IN: Auto, Manual and Priority.

- Auto
 - (1) In Auto mode, the input switching follows “Last In First Out” rule, i.e. the device always switches to the later input source and outputs it. When the selected video source is removed, the device will switch to another source automatically.
 - (2) If each input port is connected to a video source, power on the device, the device will select the video source according to the priority order (USB-C IN > HDMI IN).

For example, if a USB-C source is connected to USB-C IN, it will be selected as the input source; if not, the device will switch to the HDMI source.
- Manual

In Manual mode, the device switches to the specified video source directly. If the specified source is invalid (e.g. in standby state), the device doesn't output signal.

- **Priority**

In Priority mode, when each input port is connected to a video source, power on the device, the source with higher priority will be selected as input source. When the selected video source is removed, the device will switch to another video source automatically.

The priority for the two input ports can be defined through API commands.

Note:

- By default, the input switching mode is set as Auto.
- The input switching mode can be configured through API commands; for more information refer to the separate API document.

Control of Devices

Introduction to Different Control Tools

The device can be controlled and configured by the SC010 IP controller, including routing of audio, video, USB, RS232 and IR signals, configurations of audio & video parameters, Dante features, firmware upgrade, etc. For more information, refer to the web configuration guide of the IP controller.