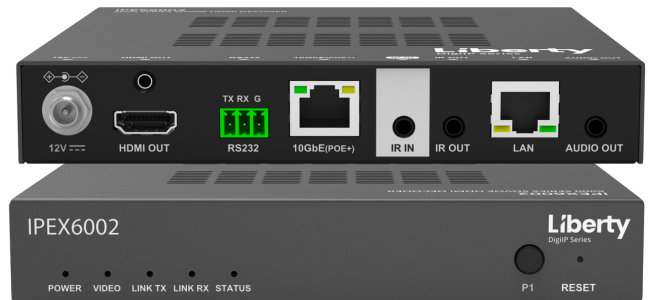
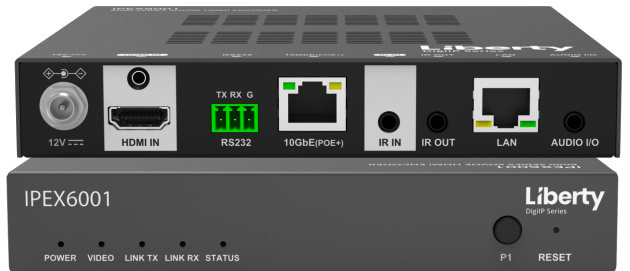
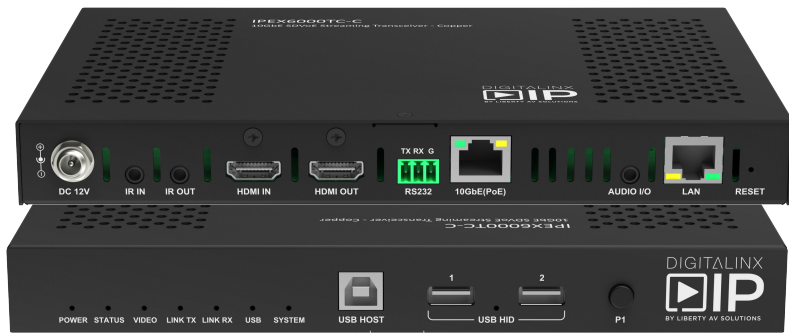


IPEX6000TC-C, IPEX6001, & IPEX6002 Install Guide, Device Manual, and Specifications



SDVoE™
ALLIANCE

Product Features

IPEX6000TC-C Transceiver

The IPEX6000TC-C is an AVoIP PoE powered A/V transceiver integrated with both encoder and decoder configuration which can transmit and receive video signals simultaneously. The DigitalinXIP IPEX6000TC-C supports IP-based switching and extension of true 4K/60Hz (4:4:4) video with zero frame latency up to 100 meters when using CAT6A F/UTP cabling. The transceiver supports independent routing of all AV, USB HID, IR, Ethernet and RS232 signals. All transceivers on an AV network can simultaneously transmit and receive full 4K 60 4:4:4 signals. The IPEX6000TC-C is HDMI 2.0 and HDCP 2.2 compliant and supports all video resolutions that fit into the HDMI 2.0 timing envelope of 594 MHz, such as 4K@60Hz 4:4:4 24bpp and 4K@60Hz 4:2:0 30bpp HDR, including DolbyVision, HDR10 and HLG. The transceiver features lite compression technology which is activated automatically when the raw data rate exceeds the Ethernet bandwidth so that all supported timing formats can be delivered through a single 10G Ethernet cable.

The IPEX6000TC-C can be used in a point to point installation or in a matrix configuration that supports routing of one to one and one to many including multi-view for single display outputs and video wall configurations up to an 8x5 (Rows x Columns).

When multiple IPEX6000TC-C transceivers are deployed on an AV network, for basic system access and operation, a license code from Liberty's Arranger offering is required.

Port speed requirements for each transceiver is ~6-8Gbps for 4K signals and 3.2Gbps for 1080P signals, therefore the IPEX6000TC-C requires a 10GbE PoE managed network switch for optimal performance.

Note: 1GbE managed network switches are not supported.

Package Contents

1. Installation Guide
2. DC 12V 2A Power Supply with US, UK, EU, and AU adapters
3. 3-pin Removable Phoenix Screw Terminal
4. Mounting Ears (2 ea)
5. IR Emitter
6. IR Receiver

Product Features

IPEX6001 / 6002 Encoder / Decoder

IPEX6001 / 6002 encoders and decoders provide the economical, flexible and powerful solution at resolutions up to 4096x2160@60Hz, 3840x2160@60Hz (4:4:4) and 3840x2160@60Hz (4:2:0 10-bit HDR). They allow uncompressed UHD media to be switched and distributed over standard 10GbE Ethernet networks with zero frame latency.

Flexible and Cost-effective Deployment

IPEX6001/6002 series products can work together with full-feature 6000 Series DigilP products including IPEX6000TC transceivers and 6000 series wall plate encoder / decoder in AV distribution / signal routing applications. IPEX6001/6002 do not include video processing or scaling keeping cost down for applications where these features are unnecessary. IPEX6002 cannot be used within a video wall (IPEX6001 can feed a video wall with appropriate decoders), and IPEX6001 and 6002 can not be part of a multi-view application.

Multiple Signal Delivery

Standard features like bi-directional serial, bi-directional IR, Gigabit Ethernet, and independent analog audio input/output are included. They are the perfect solution for any zero-frame latency and signal routing applications. Common applications include classrooms, digital signage, conference rooms, performing arts and broadcasts.

Port speed requirements for each encoder/decoder is ~6-8Gbps for 4K signals and 3.2Gbps for 1080P signals, therefore the IPEX6001/6002 requires a 10GbE PoE managed network switch for optimal performance.

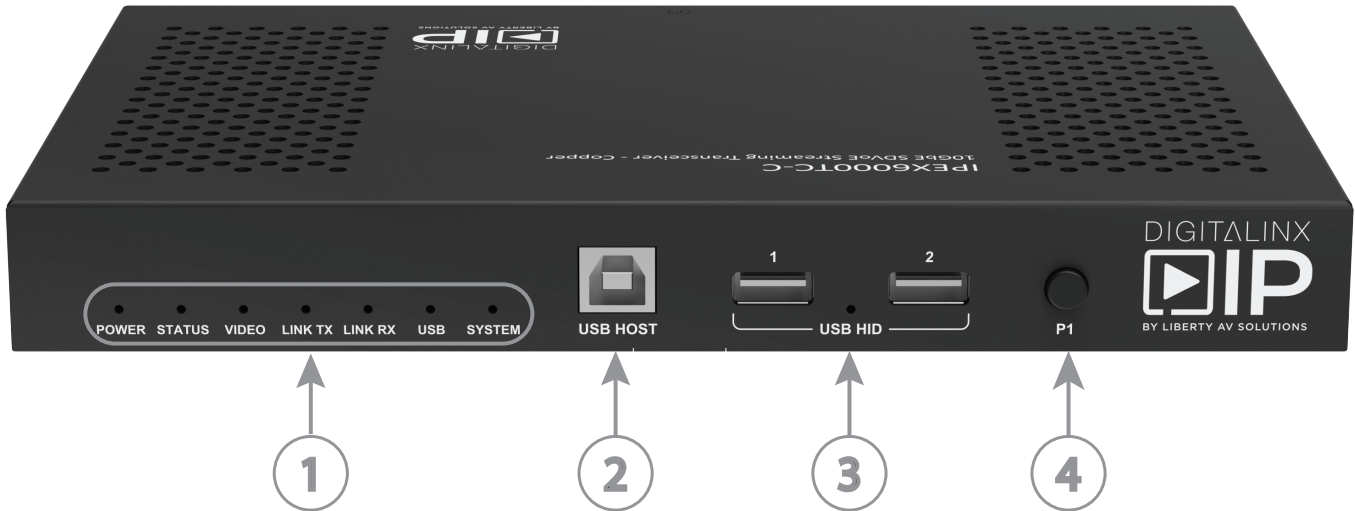
Note: 1GbE managed network switches are not supported.

Package Contents

1. Installation Guide
2. DC 12V 2A Power Supply with US, UK, EU, and AU adapters
3. 3-pin Removable Phoenix Screw Terminal
4. Mounting Ears (2 ea)
5. IR Emitter or Receiver

Front and Rear Panels

IPEX6000TC-C Front Panel



1. Status / Diagnostic LEDs

- POWER:
 - ON; device is on
 - OFF; device is off
- STATUS:
 - ON; device has entered HDMI config mode
 - BLINKING; The device is working in default mode
 - OFF; the HDMI output has been configured as a LOOP output
- VIDEO
 - ON; video signal is stable
 - OFF; no video signal detected
- LINK TX
 - BLINKING; device is connected to switch and or another device
 - OFF; device is not connected to switch or another device
- LINK RX
 - BLINKING; device is connected to switch and or another device
 - OFF; device is not connected to switch or another device
- USB
 - ON; the device is powered on
 - BLINKING; This device is linked to another device, and its USB Host port is connected to a USB host device.
- SYSTEM - for future use

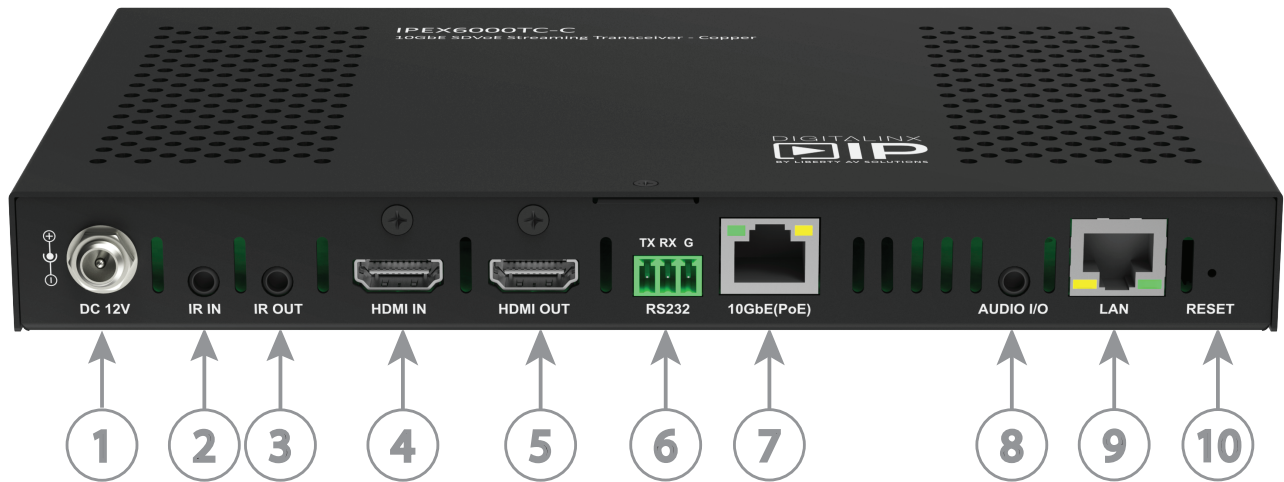
2. USB B Host Connection

3. USB HID Device Client Connection

4. HDMI config mode (Transceiver mode only)

- Press and hold 5 seconds to enter HDMI config mode
 - Press this button once: when HDMI ports are in normal state, press this button once to switch the HDMI ports to support local loop out mode; when HDMI ports are in local loop out state, press this button once to switch the HDMI ports to original normal state i.e. Input, Output

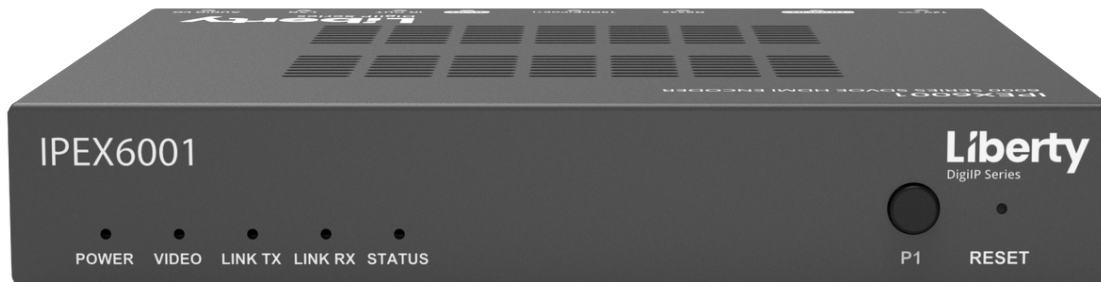
IPEX6000TC-C Rear Panel



1. 12V DC power input
2. IR receiver input
3. IR emitter output
4. HDMI input
5. HDMI output
6. RS232 / serial connection
7. 10GBaseT AV Network connection with PoE support
8. Analog audio input/output
9. 10/100/1000BaseT LAN connection
10. Factory RESET button
 - To set factory default, power the device down. While unit is powered down, press and hold the RESET button and power on the device. Hold the RESET button for 20 seconds and then release the RESET button. The unit will be reset to Factory defaults after you release the RESET button.

Front and Rear Panels

IPEX6001 Front Panel



No.	Name	Description
1	Power LED	<ul style="list-style-type: none">On: The device is powered on.Off: The device is powered off.
2	Video LED	<ul style="list-style-type: none">On: Stable video signal is detected.Off: No video signal is detected.
3	Link TX	<ul style="list-style-type: none">Blinking: The device is sending Ethernet data.Off: The device does not send Ethernet data.
4	Link RX	<ul style="list-style-type: none">On: The device is processing video signal but not receiving Ethernet data.Blinking: The device is receiving Ethernet data and processing video signal.Off: The device neither receives Ethernet data nor processes video signal.
5	Status LED	<ul style="list-style-type: none">On: The Reset button is being pressed when the device is powered on.Blinking slowly: The device is working properly.Blinking quickly: The device will blink quickly three times in the condition that it is working properly and its P1 button is being pressed. This status indicates "no actual function".
6	P1	Reserved.
7	Reset	Press and hold this button and then connect the device to power, hold this button for at least twenty seconds until <i>Video</i> , <i>Link TX</i> and <i>Link RX</i> LEDs blink for three times simultaneously and release it, the device resets to factory defaults.

Front and Rear Panels

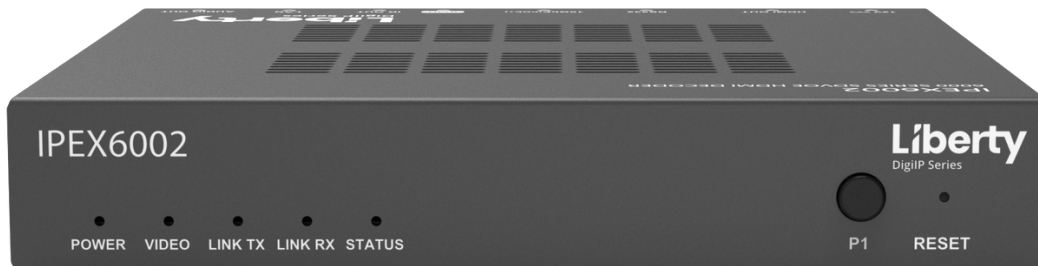
IPEX6001 Rear Panel



No.	Name	Description
1	DC 12V	Connect to the power adapter provided.
2	HDMI In	Connect to an HDMI source device.
3	RS232	Connect to a RS232 device such as a computer for bi-directional serial communication with a RS232 device connected to another IP6000LASC series unit on the network.
4	10GbE (PoE+)	<p>Connect this port to a 10GbE Ethernet switch for the following use:</p> <ol style="list-style-type: none"> 1) IP stream output. 2) Device control. 3) Power receiving (if the switch supports PoE+). <p>Default protocol: DHCP: On When the device is not connected to an DHCP server in the system: IP address: 169.254.x.x Subnet mask: 255.255.0.0</p> <p>Note: The device can be powered by either a PoE+ supported switch or a DC 12V 2A power adapter.</p>
5	IR In	Connect to an IR receiver for IR communication with an IR emitter in another IP6000LASC series unit on the network.
6	IR Out	Connect to an IR emitter for IR communication with an IR receiver in another IP6000LASC series unit on the network.
7	LAN	Connect to a switch or a computer for device control.
8	AUDIO IN	Connect to an audio source device for audio input.

Front and Rear Panels

IPEX6002 Front Panel



No.	Name	Description
1	Power LED	<ul style="list-style-type: none">• On: The device is powered on.• Off: The device is powered off.
2	Video LED	<ul style="list-style-type: none">• On: Stable video signal is detected.• Off: No video signal is detected.
3	Link TX	<ul style="list-style-type: none">• Blinking: The device is sending Ethernet data.• Off: The device does not send Ethernet data.
4	Link RX	<ul style="list-style-type: none">• On: The device is processing video signal but not receiving Ethernet data.• Blinking: The device is receiving Ethernet data and processing video signal.• Off: The device neither receives Ethernet data nor processes video signal.
5	Status LED	<ul style="list-style-type: none">• On: The Reset button is being pressed when the device is powered on.• Blinking slowly: The device is working properly.• Blinking quickly: The device will blink quickly three times in the condition that it is working properly and its P1 button is being pressed. This status indicates "no actual function".
6	P1	Reserved.
7	Reset	Press and hold this button and then connect the device to power, hold this button for at least twenty seconds until <i>Video</i> , <i>Link TX</i> and <i>Link RX</i> LEDs blink for three times simultaneously and release it, the device resets to factory defaults.

Front and Rear Panels

IPEX6002 Rear Panel



No.	Name	Description
1	DC 12V	Connect to the power adapter provided.
2	HDMI Out	Connect to an HDMI display device.
3	RS232	Connect to a RS232 device such as a computer for bi-directional serial communication with a RS232 device connected to another IP6000LASC series unit on the network.
4	10GbE (PoE+)	<p>Connect this port to a 10GbE Ethernet switch for the following use:</p> <ol style="list-style-type: none"> 1) IP stream input. 2) Device control. 3) Power receiving (if the switch supports PoE+). <p>Default protocol: DHCP: On When the device is not connected to an DHCP server in the system: IP address: 169.254.x.x Subnet mask: 255.255.0.0</p> <p>Note: The device can be powered by either a PoE+ supported switch or a DC 12V 2A power adapter.</p>
5	IR In	Connect to an IR receiver for IR communication with an IR emitter in another IP6000LASC series unit on the network.
6	IR Out	Connect to an IR emitter for IR communication with an IR receiver in another IP6000LASC series unit on the network.
7	LAN	Connect to a switch or a computer for device control.
8	AUDIO Out	<p>Connect to an audio receiver (e.g. amplifier, speaker) for audio output.</p> <p>Note: By default, this port will output the audio signal of</p>

No.	Name	Description
		the audio source connected to Audio In on encoder. To select HDMI source for analog audio output, use control tool or API.

System Installation Instructions

Connect Transceivers / Encoders / Decoders to Network Switch

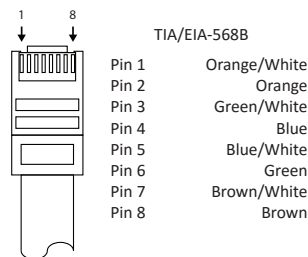
Configure a 10GbE managed PoE network switch for multicast video operation.

Note: A 1G network switch cannot be used with the 6000 series due to the high port speed requirements of the IPEX6000TC-C, a 10GbE managed network switch is required.

Liberty has documented several network switch settings for many common switch manufacturers, see documents related to this product on the product page of the Liberty AV website (www.libav.com).

Connect Category 6A from the network switch to the appropriate transceivers 10GbE LAN port.

Use TIA/EIA-568B crimp pattern for Category cable termination.



If the managed PoE network switch cannot provide adequate power to the transceiver, connect the included power supply to the DC power input of the device and connect to a local AC power source.

Best Practice

When installing the AV endpoints, create a spreadsheet of all AVoIP transceivers notating the MAC address, the attached source/sync and the desired transceiver function, i.e. encoder, decoder or both. This will aid in fast final system commissioning that could be done remotely by accessing the AV system server via VPN or via port forwarding. See Arranger Documentation for more information on how to access the server and set up port forwarding.

Device IP Settings

The 6000 series devices default to DHCP so a router or DHCP server can assign an IP address to the device automatically. If there is no router or DHCP server present it will default to APIPA i.e. 169.254/16 Network ID. You will use the *Arranger* application to find and manage 6000 devices on a Network. **See Device / System Control.**

Connecting HDMI Devices

Use only high quality High Speed HDMI cables rated for 18Gbps, do not exceed HDMI cable lengths over 5m/15' for transceiver HDMI connections to AV sources and displays.

Connecting Audio Devices

The 3.5mm analog audio I/O connection can be configured as an input or an output and is configured in the Arranger server. Connect a 3.5mm stereo audio cable to the transceivers audio I/O port

Note: Audio output is 2 channel stereo audio only and is not capable of downmixing multi channel audio

Connecting USB Devices

A transceiver can be configured as either a USB host or client, this is configured in the Arranger server. Connect USB components to transceivers with USB 2.0 rated cables, do not exceed cable lengths over 5m/15'

Note: 6000 Series supports USB HID, which is ideal for simple KVM or touch control. Do not use high quality USB microphones or webcams on this transceiver

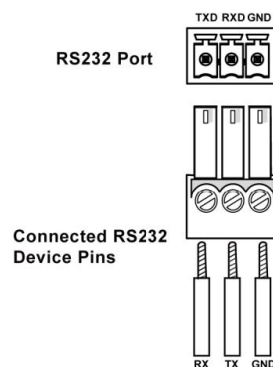
Connecting IR Components

The IR connections on the transceivers provide a means to control remote IR equipment.

Note: Please ensure power is disconnected from the encoders and decoders before connecting the IR receiver to the IR input ports on the devices.

Connecting Serial / RS232 Compatible Devices

The RS232 connections on the transceivers provide a means to control 3rd party devices using serial commands. Connect the TX, RX, and ground control signal wires to the removable 3-pole terminal block, be sure the wiring from transceiver to the device is TX - RX, RX - TX, G - G. See illustration below



Device / System Control

Arranger is an AVoIP server application that will configure and manage the 6000 series on an AV IP Network. Arranger is licensed per endpoint for one AV Network and a license unlock code should have been provided upon purchase of the Arranger DigiIP 6000 series license.

If you are missing the license unlock code contact supportlibav@libav.com and have serial number of the hardware controller nearby to confirm system license

Connect Arranger Controller

The provided Arranger hardware controller with the DigitalinxIP system should be hardwired via Ethernet to the AV network switch.

Arranger Server Login

Once the hardware controller has been connected to the AV Network, the Arranger server application can be accessed via web browser on any PC that is connected to the same AV Network switch. By default the IP address for the Arranger server is 169.254.1.1. For initial system setup your PC will need to be in the same Network ID, i.e. 169.254/16.

Upon first login of the Arranger server you will be asked for an unlock code for your license, once the license has been entered you will be prompted for login credentials, by default the user name is *admin* and the password is *admin* to login to the system initially.

Once logged in you will be asked to change the admin login password.

Best Practice

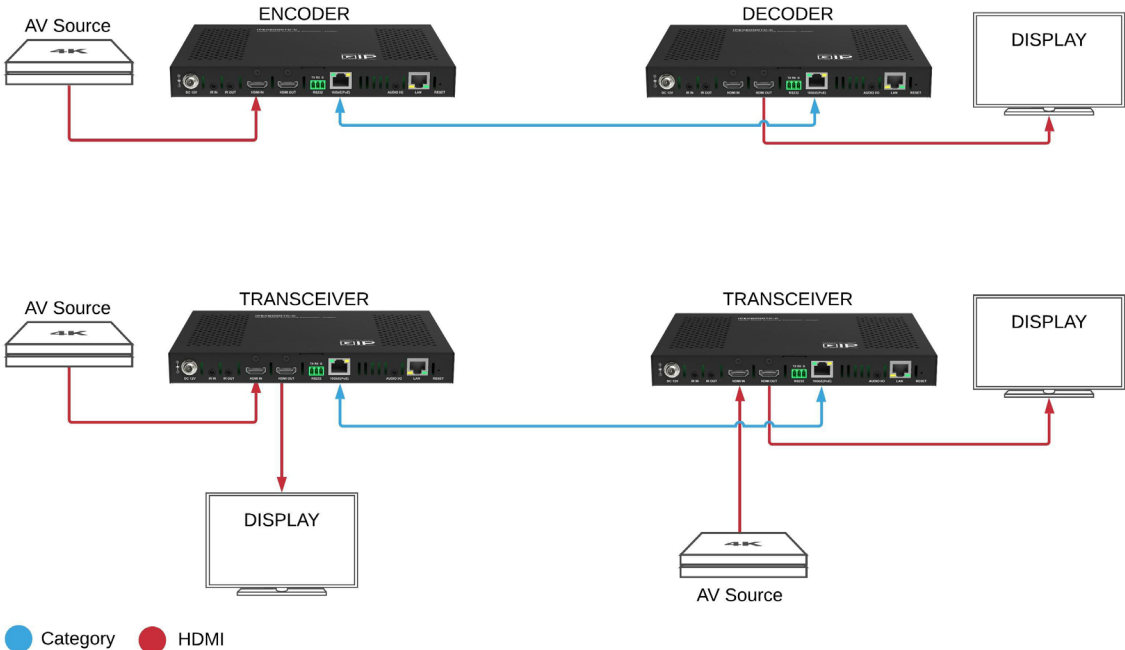
Log the changed password that you created in your project documentation spreadsheet.

Once logged in you can configure, manage and control all signal types for the DigitalinxIP 6000 series devices. A complete operation manual and API for the Arranger system is located in the Arranger server application.

Application Diagrams

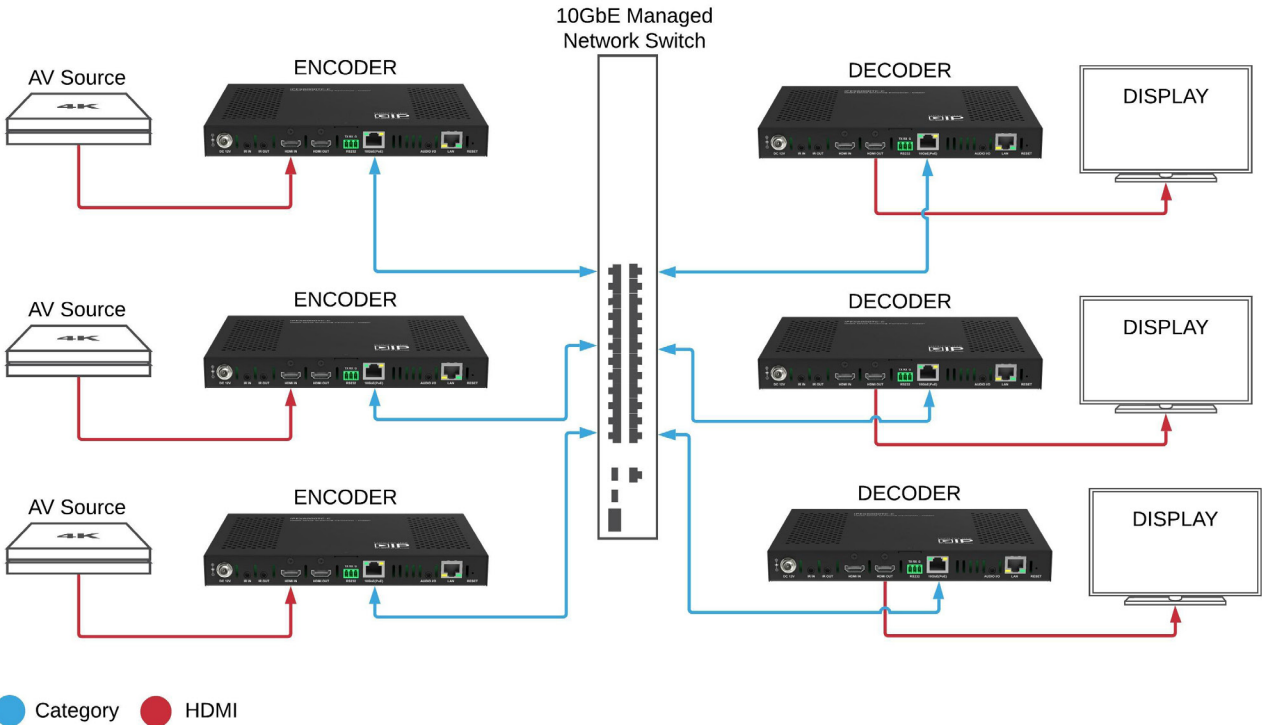
Note: Transceiver modes as notated (encoder, decoder or both) can be configured by the Arranger server

Point to Point AV Extender

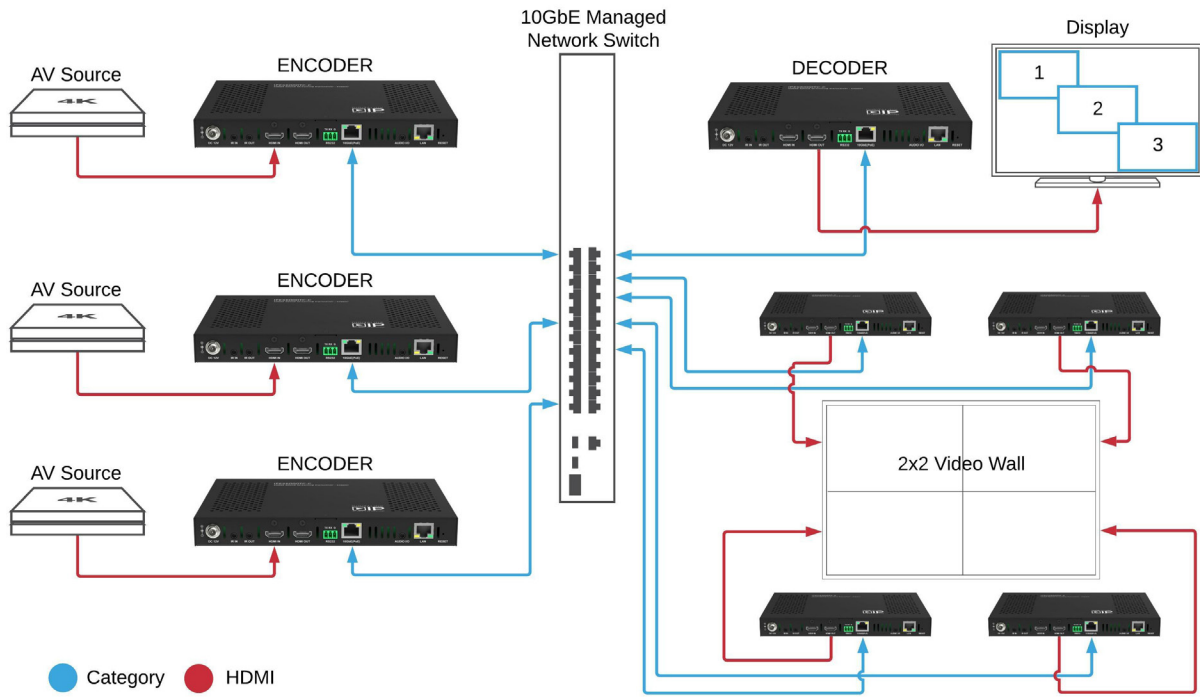


Note: Both transceivers must be connected to local power AC outlet with the supplied DC power supplies, the point to point application does not support PoE.

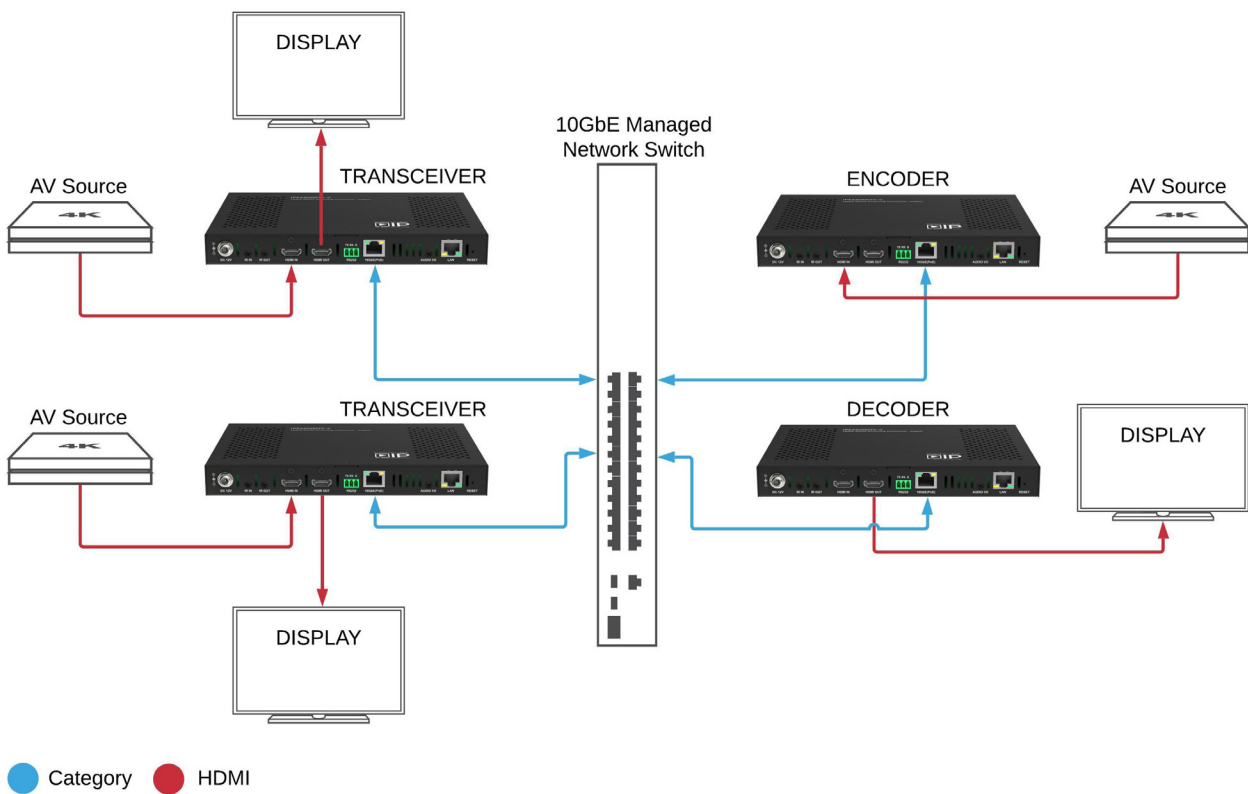
A/V Network Matrix



A/V Network Multi-view and Video Wall



A/V Network Transceiver Mode



IPEX6000TC-C Technical Specifications

Input/Output Connections	
HDMI Input	One (1) HDMI Type A Receptacle
HDMI Output	One (1) HDMI Type A Receptacle
LAN	10GbE: One (1) 8P8C port (Shielded RJ45) LAN: One (1) 8P8C port (Shielded RJ45)
Power	One (1) 5.5 mm OD, 2.1 mm ID Threaded Barrel
RS232 Port	One (1) 3-pin Removable Terminal Block Connector
USB Device / Client	Two (2) USB Type A Port
USB Host	One (1) USB Type B Port
Audio Input / Output	One (1) 3.5 mm TRS Receptacle
IR Input	One (1) 3.5 mm TRS Receptacle
IR Output	One (1) 3.5 mm TS Receptacle
Supported Audio, Video and Control	
Video Input Resolutions	Resolutions up to 4K@60Hz, 4:4:4 Supports HDR Metadata, including DolbyVision, HDR10 and HLG
Video Output Resolutions	Resolutions up to 4K@60Hz, 4:4:4 Supports HDR Metadata, including DolbyVision, HDR10 and HLG
Video Compliance	HDMI 2.0 and HDCP 2.2
Embedded Audio	HDMI: LPCM, 2.0/5.1/7.1 channel, 44.1/48/96/192 kHz, Dolby True HD, up to 7.1,192kHz, DTS-HD Master, up to 7.1,192kHz, Dolby Digital AC-3 (DVD format), DTS version 1 (DVD format) Analog / 3.5mm: Unbalanced 2 channel stereo
Supported Baud Rates	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
USB Compliance	USB 1.1 Full Speed up to 12Mbps
Video Wall Scale Capability	Up to 8x5
Streaming Signal Characteristics	
Maximum Distance (point to point)	30m (90') when using CAT6 100 m (328 ft) when using CAT6A or greater
Maximum Distance (matrix, multi-view, video wall)	30m (90') when using CAT6 100 m (328 ft) when using CAT6A or greater
Cable Requirements	Category 6 or greater with TIA/EIA-568B crimp pattern
Encoding Data Rate	4K Signals: Up to 8Gbps 1080p Signals: Up to 4Gbps
End to End Latency	Zero Frame Latency
Chassis and Environmental	
Dimensions (H x W x D)	25 mm x 215 mm x 140 mm (0.98in x 8.5 in x 5.5 in)
Weight	0.8kg / 2.2 lbs
Operating Temperature	0° to +45° C (+32° to +113° F)
Operating Humidity	10% to 90%, Non-condensing
Storage Temperature	-20° to +70° C (-4° to +140° F)
Storage Humidity	10% to 90%, Non-condensing
Power and Regulatory	
Power Input	12V DC 2A or 48V DC PoE (Power over Ethernet)
Power Consumption	11 watts
ESD Protection	8kV air, 4kV contact
Regulatory	FCC, CE, RoHS
Other	
Warranty	5 years
Included Accessories	Installation Guide, Power Supply with US, UK, EU and AU adapters, 3-pin Removable Screw Terminal, Mounting Ears (2 ea), IR emitter, IR receiver
Compatible Transceiver	IPEX6000TC-F

Distances and picture quality may be affected by cable grade, cable quality, source and destination equipment, RF and electrical interference, and cable patches.

IPEX6001 / 6002 Technical Specifications

Model	IPEX6001	IPEX6002
Video		
Input Video Port	1 x HDMI	1 x RJ45 (10GBase-T)
End-to-End Time Latency	Zero-frame latency	
Output Video Port	1 x RJ45 (10GBase-T)	1 x HDMI
Input/Output Video Resolutions	<p>640x480⁸, 800x600⁸, 1024x768⁸, 1280x1024⁸, 1360x768⁸, 1440x900⁸, 1440x1050⁸, 1600x1200⁸, 720x480⁷(480i59), 720x480⁷(480p59), 720x576⁶(576i50), 720x576⁶(576p50), 1280x720⁵(720p50), 1280x720⁷(720p59), 1280x720⁸(720p60), 1920x1080⁵(1080i50), 1920x1080⁷(1080i59), 1920x1080⁸(1080i60), 1920x1080¹(1080p23), 1920x1080²(1080p24), 1920x1080³(1080p25), 1920x1080⁴(1080p29), 1920x1080⁵(1080p30), 1920x1080⁶(1080p50), 1920x1080⁷(1080p59), 1920x1080⁸(1080p60), 3840x2160¹(2160p23), 3840x2160²(2160p24), 3840x2160³(2160p25), 3840x2160⁴(2160p29), 3840x2160⁵(2160p30), 3840x2160⁶(2160p60), 4096x2160⁵, 4096x2160⁸</p> <p>¹ = at 23.98 Hz, ² = at 24 Hz, ³ = at 25 Hz, ⁴ = at 29.97 Hz, ⁵ = at 30 Hz, ⁶ = at 50 Hz, ⁷ = at 59.94 Hz, ⁸ = at 60 Hz</p>	

Model	IPEX6001	IPEX6002
Audio		
Input Audio Port	1 x HDMI 1 x 3.5 mm jack	1 x RJ45, 10GBase-T
Output Audio Port	1 x RJ45, 10GBase-T	1 x HDMI 1 x 3.5mm jack
Input/Output Audio Format	<ul style="list-style-type: none"> HDMI/10GBase-T/10GBase-SR: <ul style="list-style-type: none"> LPCM, 2.0/5.1/7.1 channel, 44.1/48/96/192 kHz Dolby True HD, up to 7.1, 192kHz DTS-HD Master, up to 7.1, 192kHz Dolby Digital AC-3 (DVD format) DTS version 1 (DVD format) Dolby TrueHD Atmos (Blu-ray Player mainly) Dolby Digital Plus Atmos (Most streaming boxes) Dolby MAT Atmos (AppleTV, Xbox) 	

IPEX6001 / 6002 Technical Specifications

Model	IPEX6001	IPEX6002
	<ul style="list-style-type: none"> 3.5 mm jack: Unbalanced stereo audio 	
Control		
Control Method	LAN, IP Control Box, PC Configurator, BlueRiver Manager API, Semtech ProAV Controller	

General	
Operating Temperature	+32°F ~ +104°F (0°C ~ +40°C) 10% ~ 90%, non-condensing
Storage Temperature	-4°F ~ 158°F (-20°C ~ +70°C) 10% ~ 90%, non-condensing
Power Supply	12V 1A DC; PoE+
Power Consumption (Max)	IPEX6001: 6.6W IPEX6002: 7.2W
Transmission Distance	Cat 6a Cable: 100m Cat 7 Cable: 100m
ESD Protection	Human body model: <ul style="list-style-type: none"> ±8kV (air-gap discharge) ±4kV (contact discharge)
Product Dimensions (W x H x D)	145.2mm x 150mm x 25mm (L x W x H)
Net Weight	1.72lbs (0.78kg)

Thank you for your purchase.

For Technical Support please call our toll free number at
800-530-8998 or email us at supportlibav@libav.com

www.libav.com



11675 Ridgeline Drive
Colorado Springs, Colorado
80921 USA
Phone: 719-260-0061
Fax: 719-260-0075
Toll-Free: 800-530-8998