PIXELHUE PRO AV

PD3-S20

Dual-Streaming AVoIP Processor

Specifications

Change History

File Version	Release Date	Description
V1.0.0	2025-07-04	First release

Introduction

The PD3-S20 distributed LED processor is an innovative dual-streaming AVoIP processor that supports simultaneous transmission of both the primary stream (video content in high quality) processed by InstSight algorithm and the secondary stream (video content in standard quality) processed by H.264/H.265. The PD3-S20 occupies low network bandwidth while providing low-latency and lossless audio and video experience. Additionally, the PD3-S20 can efficiently decode audio and video data encoded by encoding nodes in a distributed system and also transmit data to an LED screen, enabling network-wide sharing of multimedia content.

The PD3-S20 breaks the limitations of traditional centralized deployment, making it perfect for decentralized deployment of audio and video interconnection applications across floors, regions, and networks.

Equipped with features such as long-distance digital audio and video transmission, signal switching and screen management, the PD3-S20 integrates smoothly with AVoIP Visual Management System. It's perfect for demanding environments like command centers, large conference communication centers, monitoring centers, data centers, and dispatch operations. Its versatile and powerful capabilities make the PD3-S20 a standout for LED display solutions in today's distributed systems.

Certifications

None

If the product does not have the relevant certifications required by the countries or regions where it is to be sold, please contact PIXELHUE to confirm or address the problem. Otherwise, the customer shall be responsible for the legal risks caused or PIXELHUE has the right to claim compensation.

Features

- Dual stream transmission, across-area sharing
  - Primary streams

    Self-developed InstSight compression algorithm
  - Secondary streams

    H.264/265 compression algorithm (Self-developed algorithm based on standard H.264/265)
- Discrete deployment, unified management

Signal nodes scattered in different locations can be quickly integrated into the system through VLAN, thereby realizing centralized control and management of signal data across various locations.

- Mass access, unlimited expansion
  - With its IP-based architecture, the system can easily expand by adding more nodes through VLAN, requiring only an IP address for each node to connect.
  - Supports direct access to IP cameras and NVRs without the need for transcoding, and is fully compatible with protocols such as ONVIF and RTSP.
- Hierarchical permissions, secure management

  The system offers role-based hierarchical user permission management, allowing administrators to assign specific permissions to users. This enables fine-grained control over operations, so that users with different roles can perform specific tasks, significantly enhancing both work efficiency and security.
- Stable, secure and reliable
  - The decentralized design allows a single node to be used as an independent control center. Each node works independently and the control failure of a single node will not affect the operation of the entire system. Only the faulty node needs to be repaired. This ensures the stability of the entire system operation and facilitates system maintenance.
  - System file backup
- Convenient implementation and easy maintenance

  The distributed LED controller can be added directly to the system network to quickly expand the system, and the system automatically synchronizes system parameters without manual reconfiguration. Remote update and batch update are also supported.
- Equipment isolation, tidy and efficient

  By relocating distributed processors to an equipment room, ample space is made available in the command and control center, eliminating workspace clutter and noise. This setup allows for separation between operators and equipment, enabling one person to oversee multiple devices while enhancing data security.
- Visualized management and precise arrangement

  The system provides full visualization of the output images on screens, allowing for real-time previews of signal source images, screen layouts, and displays. This ensures precise screen display arrangement, minimizes the risk of signal switching errors, and enhances switching efficiency.
- Diversified and free presentation
  - Flexible screen configuration, supporting irregular LED screen configuration to meet the on-site requirements
  - Powerful EDID management, allowing for customized output resolutions and breaking the common output resolution limit
- Multiple audio and video access
  - Supports data access and decoding from encoding nodes.
  - Supports access of analog audio in Line IN and Mic IN formats.
  - Supports access of IP cameras using the ONVIF protocol and streaming media data using the RTSP protocol.
- Multiple layers, free layout

The screen loaded by a single device supports free layer overlapping and layout, achieving a variety of visual presentation effects.

Max layer numbers supported:

- 24x 1920x1080@30Hz secondary stream layers
- 1x 4096x2160@60Hz primary stream layer+ Maximum 23x 1920×1080@30Hz secondary stream layers

- Industry-leading nanosecond synchronization

  The PD3-S20 adopts unique synchronization technology, which combines NetSync and SuperSync at both software and hardware levels. This innovative technology fundamentally eliminates asynchronization of mosaic images from different output nodes and prevents tearing during high-speed image playback, ensuring seamless image display that withstands scrutiny from both the naked eye and cameras.

- Various OSD options
  - Supports text OSD, weather OSD and clock OSD.
  - Supports both static and dynamic text OSD.
  - Supports customized content, font, color, size, background color, opacity of the text OSD.
  - Support configurations of the text scrolling direction, initial position and speed.

- BKG settings
  - Up to 1 GB internal storage space
  - BKG images do not occupy the layer resources.
  - Max width×height of a BKG image: 16380×4320
  - Supported formats: JPG, JPEG, BMP, PNG
  - Up to 256 images can be imported.

- Channel logo management

  Set a text or image logo for identifying the input source.

- Customized presets and preset playlist playbacks
  - Supports management of multiple screens and presets.
  - Supports two preset playback modes. The options include loop and scheduled playback.

- Input source management
  - Supports customized group management of input sources.
  - Supports EDID settings for input sources.
  - Supports configurations of input source audio.

- Flexible audio options
  - Supports independent audio inputs.
  - Supports output volume adjustment.

- System call for quick device identifying

- Firmware update through a web interface

- Stream backup between the Ethernet port and OPT port

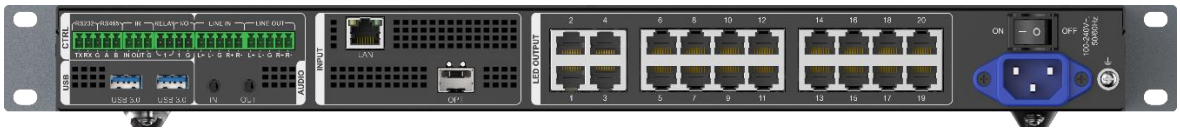
Appearance

Front Panel

*The picture shown is for illustration purpose only. Actual product may vary due to product enhancement.

No.	Area	Function
1	OLED screen	• Display the device IP address. • Display the resolution of a loaded screen.
2	Indicators	• PWR: Power indicator – On: The power supply is normal. – Off: The power supply is abnormal. • RUN: Running status indicator – Flashing: The device is functioning normally. – On/Off: The device is functioning abnormally. • LINK: Ethernet port and OPT port connection status indicator – On: At least one of the Ethernet port or OPT port is connected normally. – Off: Both the Ethernet port and OPT port are connected abnormally or not connected. • VIDEO: Video transmission and processing status indicator – On: The backend device connection is normal. – Off: The backend device is not connected or the connection is interrupted. Note When the device is called, the RUN, LINK and VIDEO indicators will flash simultaneously.

Rear Panel

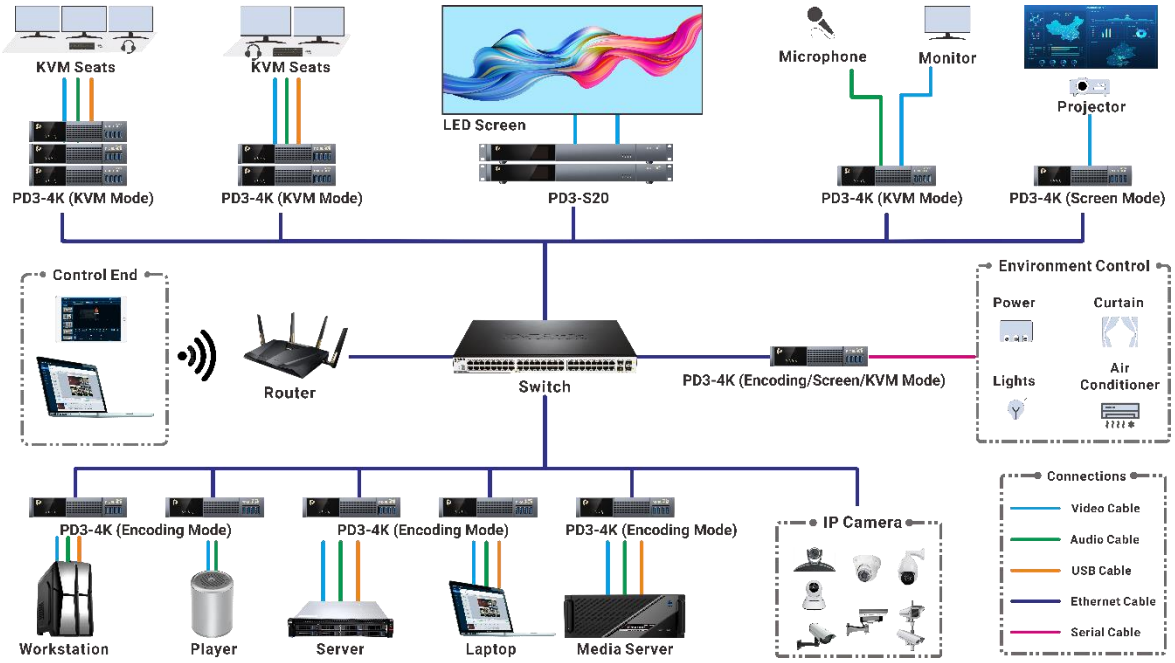


*The picture shown is for illustration purpose only. Actual product may vary due to product enhancement

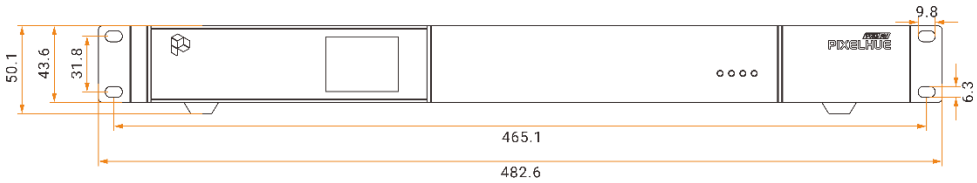
Input/Output Connectors		
Connector	**Qty**	**Description**
LAN	1	1G Ethernet ports • Standard RJ45 connector with the transmission rate up to 1Gbps, self-adaptive • For the receiving of the streaming media and control commands • Supported encoding modes: H.264/AVC, H.265/HEVC Supported protocols: rtsp/rtcp/rtp/ONVIF protocols Status LEDs: • The top left one (green) indicates the connection status. – On: The port is properly connected. – Flashing: The port is not properly connected, such as loose connection. – Off: The port is not connected. • The top right one (yellow) indicates the communication status. – On: The Ethernet cable is short-circuited. – Flashing: The communication is good and data is being transmitted. – Off: No data transmission Note Cat5e and above standard wires are recommended.
OPT	1	1G optical ports • Standard SFP connector, flexible configuration of the transmission rate as needed • For the transmission of the streaming media and control commands • Compatible with the mainstream single-mode single-core, single-mode twin-core and multimode twin-core optical fiber modules • Recommended optical fiber modules – Single-mode: 1G SFP LC optical module – Multimode: 1G SFP LC optical module • The OPT port and Ethernet port serve as the backup for each other. Note: The optical module is not installed at the factory. Please purchase and install it as needed.
Audio Connectors		
Connector	**Qty**	**Description**
AUDIO	2	1x AUDIO input, 1x AUDIO output • 3.5 mm standard audio input and output connectors • For AUDIO IN, two audio input modes are supported, including Line In and Mic In. • Audio sampling rate: 48kHz • Audio encoding format: AAC, G711a, G711u • Bit Depth: 16bit, 24bit • For AUDIO OUT, two modes are supported, including Line Out and Phone Out. • AUDIO OUT and LINE OUT can output the audio input through LINE IN and AUDIO IN. • Volume adjustment on AUDIO OUT
LINE IN	1	5-pin phoenix audio input connectors

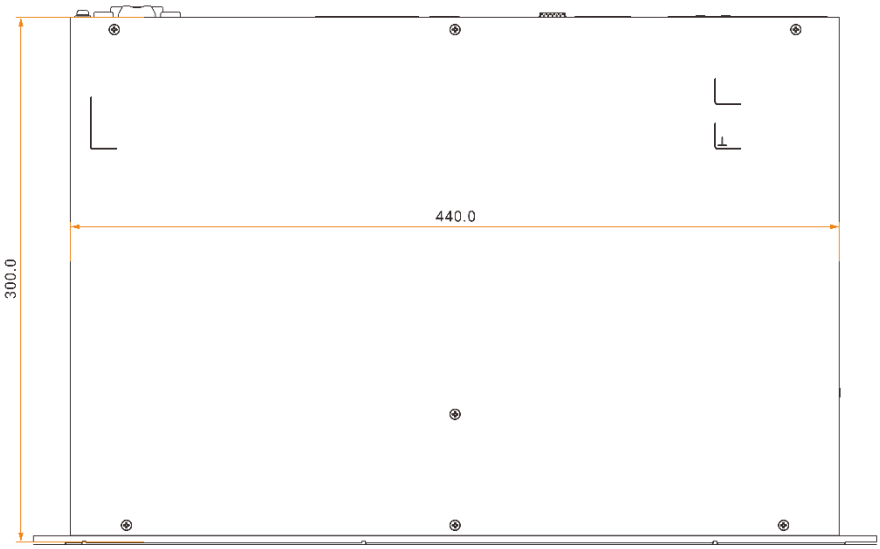
		• Dual channel input supported • Balanced audio supported
LINE OUT	1	5-pin phoenix audio output connectors • Dual channel output supported • Balanced audio supported
Transmission Connectors		
Connector	**Qty**	**Description**
RJ45	20	20x Gigabit Ethernet ports • For LED screen loading • Supports 8-bit/10-bit RGB 4:4:4 output. • Max. loading capacity: 13 million pixels – Width: 800 to 4096 pixels – Height: 600 to 2160 pixels – Output frame rates: 23.98/24/25/29.97/30/47.95/48/50/56/59.94/60/70/71.93/72/75/85/100/119.88/120Hz
Control Connectors		
RS232	Reserved	
RS485	Reserved	
IR	Reserved	
RELAY	Reserved	
I/O	Reserved	
USB	2x Type-A USB 3.0 For the control of a keyboard and mouse	
Power connector	100-240~, 50/60Hz Connect an external power outlet.	
Power switch	• **ON**: Power on the device. • **OFF**: Power off the device.	

Applications



Dimensions





Tolerance: ±0.3 Unit: mm

Specifications

Overall Specifications	
Model	PD3-S20
Layer Specifications	• H.265+ InstSight – 24x 1920×1080@30Hz secondary stream layers – 1x 4096×2160@60Hz primary stream layer+23x 1920×1080@30Hz secondary stream layers • H.264+ InstSight – 16x 1920×1080@30Hz secondary stream layers – 1x 4096×2160@60Hz primary stream layer+15x 1920×1080@30Hz secondary stream layers
MTBF (Hours)	456,412
Primary Streams	• Self-developed InstSight compression algorithm • Max Bandwidth: 716800 Kbps • Min end to end latency: 2 ms • Average end to end latency: 25 ms Note To reduce the latency to 2 ms, please refer to *User Manual* for detailed requirements.
Secondary Streams	• H.264/265 compression algorithm (Self-developed algorithm based on standard H.264/265) • Max Bandwidth: 102400 Kbps • End to end latency: ≤60 ms
InstSight Algorithm (primary stream)	Video stream compression based on self-developed InstSight algorithm • ≤SL specification (1920×1080@60Hz, width: ≤2048 pixels) – Smooth: 6× compression ratio – Excellent: 5× compression ratio – Ultimate: 4× compression ratio • >SL specification – Smooth: Compress to a target bitrate of 400 Mbps – Excellent: Compress to a target bitrate of 600 Mbps – Ultimate: Compress to a target bitrate of 700 Mbps – Maximum compression ratio: 24×, minimum compression ratio: 6×
Network	• 1 GE • IPv4 • Multicast IGMPv2/IGMPsnoopingv2 • RTP/RTCP over UDP
Network Bandwidth	• Unicast: Up to 5 clients can pull the unicast stream from an encoder

	simultaneously. • Multicast supported • Bit rate peak: 950 Mbps	
Electrical Parameters	Power connector	100-240V~, 50/60Hz
	Max power consumption	45 W
Operating Environment	Temperature	0°C to 50°C
	Humidity	5% RH to 85% RH, non-condensing
Storage Environment	Temperature	−20°C to +70°C
	Humidity	5% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	482.6 mm × 300.0 mm × 50.1 mm
Packing Information	Accessories	3x Phoenix connectors 1x Silicone dustproof plug 1x Flat screw 1x Power cable 1x Certificate of Approval 1x Safety Manual
	Net weight	TBD
	Total weight	TBD
	Packing Box	595 mm × 420 mm × 140 mm

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Technical support
service@pixelhue.com