PIXELHUE

Q8

Seamless Switcher

Specifications

Change History

Document Version	Release Date	Description
V1.5.0	2024-10-20	• Updated the description of rear panel diagram and connectors • Updated the LINK port description. • Updated the application diagram. • Updated the dimensions diagram. • Updated the product specifications information.
V1.4.1	2024-08-15	• Updated the rear panel diagram. • Updated the BKG feature description.
V1.4.0	2024-05-15	• Updated the feature description. • Updated the rear panel diagram. • Updated the input and output card names. • Updated the flight case dimensions diagram. • Updated the gross weight. • Updated the output card specifications.
V1.3.1	2024-03-15	Added the Q8_ST2110_4xSFP25G Input Card_I.

Introduction

PIXELHUE's Q8 is a seamless switcher that operates at a full 4K standard and supports 8K video processing. It adopts a modular design with a plug-in structure and allows users to flexibly configure input and output cards according to their needs, accommodating various live video inputs with stable performance. Working with the professional intelligent management software PixelFlow and the event controller U5 or U5 Pro, it can easily achieve a wide array of visual effects. Thank to that, the Q8 can be employed in various settings, including stage performances, high-end auto shows, business conferences, television production, product launches, and large exhibitions.

The Q8 is built on a powerful hardware FPGA system architecture with a modular design, combining the stability and efficiency of a purely hardware-based approach with flexible input and output card configurations. It supports full 4K ultra-high-definition video inputs and outputs, multi-screen and multi-layer management, irregular screen loading, edge blending, input EDID management and output timing management, as well as image monitoring and input view. This provides a rich visual construction experience.

Certifications

CE, FCC, IC

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

Plug-in Structure for Flexible Card Configuration

- The input and output cards feature a modular design with a plug-in structure, enabling users to freely choose and combine various input and output cards
- A card slot supports multi-capacity inputs
- Ability to monitor input and output connection status in real-time
- Ability to monitor board working status and key chip temperatures
- Input source mosaic and cropping
- Advanced DSK capability for input: smart key, luma key and chroma key
- Output color gamut adjustment
- 90° output rotation for creative display
- Automatic HDCP decryption for inputs and HDCP encryption for outputs
- Optical port backup and long-distance transmission via optical ports
- 3 EDID setting modes
  - Preset EDID
  - Custom EDID
  - Advanced EDID settings by configuring video source timing parameters
- Sync signal information at a glance

  Display the current synchronization signal and its frame rate, along with the synchronization status. If synchronization fails, users can check the reason for the failure.
- Up to two devices cascaded to load screens
- Simple control via third-party devices like Stream Deck (Companion integrated into the Q8)

Multi-Screen and Multi-Layer for Centralized Management

- Intelligent 4K@60Hz image processing

  Leveraging industry-leading seamless scaling algorithms and 4:4:4 video processing technology, the product faithfully restores image colors and retains intricate details. Even when videos are scaled down, the image boundaries remain sharp and natural, and the texture depth is consistently maintained, delivering a clearer and more authentic viewing experience for viewers.
- Multi-screen control
  - Each connector of the output card supports different resolution settings.
  - Each connector can create a screen with a unique resolution, allowing a single switcher to load multiple large screens with different resolutions.
  - Multiple output connectors supports splicing for uneven screen division, with each connector driving a section of the screen with varying resolutions.
  - Virtual pixel configuration is supported, simplifying calculations between on-site screen size and Q8-loaded screen pixels.

- Synchronized output connector splicing

  With the help of frame synchronization, the output images on all the connectors are completely synchronized. This enables the output to deliver smooth playback and perfect image without issues such as picture stutter, frame loss, image tearing, and noticeable cut lines.

- Multi-layer
  - A single output card supports up to 8x 4K layers.
  - Each layer's position and size can be freely adjusted, with options for setting borders and shadows.
  - Layer copying and flipping are supported.
  - Irregular layers are supported.
  - Layer resource management enables viewing of remaining available layers.
- Output image quality enhancement

  Inputs, outputs, and layers can be adjusted for image quality, with available settings for brightness, contrast, saturation, hue, and gamma.

- BKG settings
  - Local images and images captured from input sources and PGM can be used as BKG images.
  - The BKG storage capacity is up to 1 GB, with no resolution limit for a single BKG image.
  - The BKG image fills the whole screen at the bottom automatically by default.
  - The BKG position and size are adjustable.
- 1024 presets, flexible saving and recall
  - Up to 1024 presets can be saved from PVW or PGM.
  - Preset names can be modified and overwritten.
  - Custom layouts, sizes, and positions of layers with different signals on the screen can be saved as presets.
  - Different presets can be recalled instantly to change the display content or layout, meeting diverse application needs.
- Preview video signals, layer images and layout for easy operation control and send PVW to PGM with effects to deliver professional-quality presentations
  - TAKE: Send PVW to PGM with an effect and adjustable effect duration.
  - T-bar: Manually control the fade effect speed.
  - CUT: Send PVW to PGM directly without effect.
- Layer preset

  Save layer properties and apply them to other layers for quick configuration.

- KeyFrame

  Only layer position and size can be adjusted for now (Additional functionalities will be implemented in future updates.)

- Quick switching of screen frame rates

  Change the frame rates for all output connectors on the screen in one batch.

  - Individual brightness and contrast adjustment for RGB

    Adjust brightness and contrast individually for R, G, and B components, offering more flexible image quality adjustments.

  - HDR format conversion

    Convert input sources to SDR, HDR10, or HLG formats.

- Cut & Fill

  Use the original layer as a Fill layer and overlap it with the Cut layer to display the visible image of the Cut layer, allowing users to define output shapes and effects more flexibly.

- Edge blending

  Blend the overlapping edges of the images projected by multiple projectors to ensure uniform brightness across the entire display.

- LCD bezel compensation

  Eliminate the visual disruption caused by seams in spliced LCD displays, resulting in a more unified and seamless display.

Multiple Design Features for Stable Operation

  - Device backup

    With device backup enabled, when a layer's input source is missing or has no signal, all output connectors for the screen immediately stop signal output, initiating a switch to the backup channel through coordination with the sending and receiving cards.

  - Input source hot backup

    Two input sources connected to the input connectors can be configured as mutual backups. If one input source loses its signal, the system automatically switches to the backup source.

  - 2+1 power supply backup to ensure the system stability
  - Monitor all input sources, PVW, and PGM
  - Data backup and recovery

    Once device configuration is complete, project files can be saved locally. In case of data loss or the need for reconfiguration, these files can be used for quick restoration.

  - Device diagnostics
  - Automated system monitoring and alarm

    Hardware monitoring capabilities encompass fan speed, module temperatures, voltage levels, and operational status.

Video Source Specifications

Input	Bit Depth	Sampling Format	Supported Resolutions	Supported Bandwidth
HDMI 2.0	8bit	RGB 4:4:4	4096×2160@60Hz 8192×1080@60Hz	18 Gbps
		YCbCr 4:4:4		
		YCbCr 4:2:2		
	10bit	RGB 4:4:4	4096×2160@30Hz 4096×1080@60Hz	
		YCbCr 4:4:4		
		YCbCr 4:2:2	4096×2160@60Hz	
	12bit	RGB 4:4:4	4096×2160@30Hz 4096×1080@60Hz	
		YCbCr 4:4:4		
		YCbCr 4:2:2	4096×2160@60Hz	
DP 1.2	8bit	RGB 4:4:4	8192×1080@60Hz 4096×2160@30Hz 3840×2160@60Hz	21.6 Gbps
		YCbCr 4:4:4		
		YCbCr 4:2:2		
	10bit	RGB 4:4:4		
		YCbCr 4:4:4		
		YCbCr 4:2:2		
	12bit	RGB 4:4:4		
		YCbCr 4:4:4		
		YCbCr 4:2:2		
12G-SDI	8bit	YCbCr 4:2:2	4096×2160@60Hz	11.88 Gbps
	10bit	YCbCr 4:2:2		
	12bit	YCbCr 4:2:2		
SFP25G	8bit	RGB 4:4:4	4096×2160@60Hz	25 Gbps
		YCbCr 4:4:4		
		YCbCr 4:2:2		
	10bit	RGB 4:4:4		
		YCbCr 4:4:4		
		YCbCr 4:2:2		

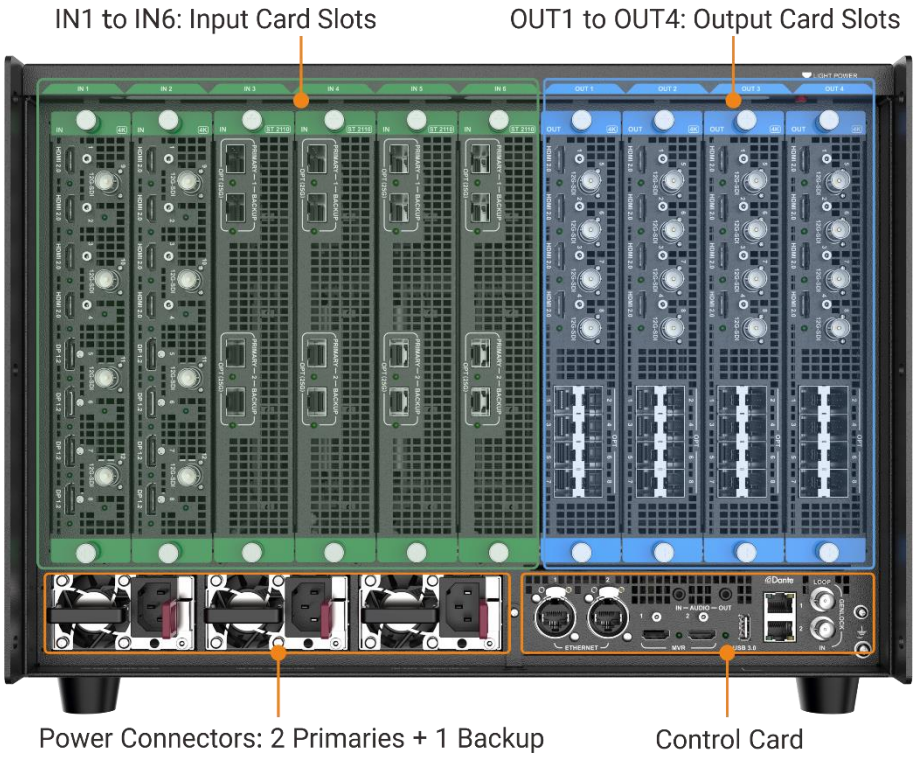
Appearance

Front Panel

No.	Type	Description
1	Power button	• Power on: Press the button to turn on the device. • Power off: Press the button, and a shutdown prompt window appears on the LCD screen. Tap **Yes** to shut down the device.
2	LED strip	Indicate the device running status. • Blue: The device is operating normally. The strip supports breathing and flashing effects. • Off: The device is either not powered or is malfunctioning.
3	LCD screen	Display the device status, menus, submenus and messages for parameter settings.
4	USB 3.0	1x USB 3.0 (Type-A) port • Update device firmware via USB drive. • Export logs, and import and export projects.
5	LINK port	Link two Q8 units for cascading and control. (Reserved) • 3x CXP ports (reserved) They enable the sharing of input sources between two devices. Ports 1 and 2 can each share up to 6x 4K input sources, while port 3 can share up to 4x 4K input sources. Together, they can share a maximum of 16x 4K input sources. • 1x LINK IN It accepts the synchronization control signal in scenarios where a single event controller or control software controls multiple switchers.

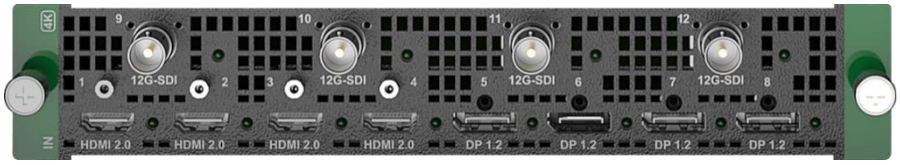
No.	Type	Description
		• 1x LINK OUT It loops the synchronization control signal in scenarios where a single event controller or control software controls multiple switchers. • 1x OPT, 10 optical port (reversed) Note: The LINK IN and LINK OUT ports are designed to enable control cascading among switchers in scenarios where they are controlled by a single event controller or control software. In these scenarios, one switcher should be set as the master and the others as slaves. By connecting the LINK IN and LINK OUT ports among the switchers using Ethernet cables, control commands can be synchronized effectively.
6	LINK port cover	Cover the LINK ports.

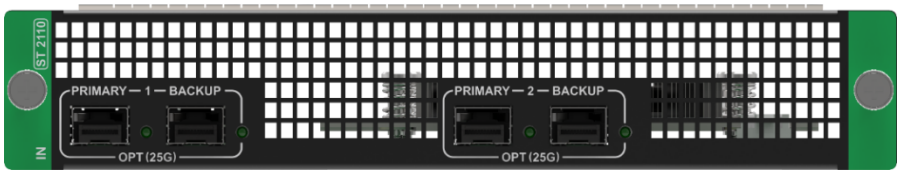
Rear Panel (Fully Loaded)



Note

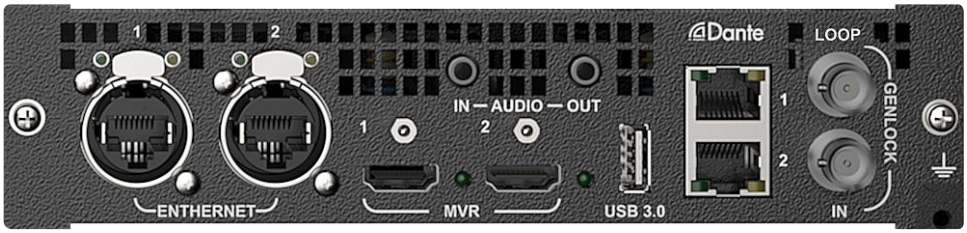
- The picture above is the rear panel of the device when it is fully loaded. Users can configure input and output cards as needed.
- The input and output cards are replaceable. Up to 6 input cards and 4 output cards can be installed.

Input Card	
Q8_HDMI2.0+DP1.2+ 12G-SDI Input Card	 • 8x 4K×2K@60Hz concurrent inputs per input card • Each input card supports a maximum of 4-channel deinterlacing processing • Each input card provides a maximum of 4 sync sources **4x HDMI 2.0** • Up to 4K×2K@60Hz 10bit 4:2:2, or 4K×2K@60Hz 8bit 4:4:4 • Support for processing of 8-bit, 10-bit and 12-bit inputs • Support for 4:2:0, 4:2:2 and 4:4:4 inputs • Support for processing of Full and Limited range videos • Support for HDR video inputs • HDCP 1.4 and HDCP 2.2 compliant • Support for deinterlacing processing • Custom resolutions – Maximum width: 8192 pixels – Maximum height: 8192 pixels **4x DP 1.2** • Up to 4K×2K@60Hz 10bit 4:4:4, or 4K×2K@60Hz 8bit 4:4:4 • Support for processing of 8-bit, 10-bit and 12-bit inputs • Support for 4:2:2 and 4:4:4 inputs • Support for processing of Full and Limited range videos • Support for HDR video inputs • HDCP 1.3 and HDCP 2.2 compliant • Custom resolutions – Maximum width: 8192 pixels – Maximum height: 8192 pixels **4x 12G-SDI** • Support for ST-2082 (12G), ST-2081 (6G), ST-424 (3G), ST-292 (HD) and ST-259 (SD) standard video inputs • Compatible with SD-SDI, HD-SDI, 3G-SDI and 6G-SDI • Support for interlaced signal inputs • No support for EDID management or bit depth settings **Status LEDs** Each input connector has a status LED which indicates source access status. • On: The source is accessed. • Off: The source is not accessed or it is abnormal.

Q8_ST2110_4xSFP25G Input Card_I	 • 25G SFP28 interface: For video source transmission, control, and synchronous clock input. • Supports SMPTE 2110-10 and 2110-20, and backup supports the ST2022-7 standard. • Hardware-based precision time protocol (PTP) guarantees the nanosecond-level synchronization accuracy requirements of ST2059-1 and ST2059-2. • The video interface and control interface are combined into one, supporting standard NMOS discovery and registration devices (IS-04), management and control devices (IS-05). • Simultaneous input of primary and backup video sources, enabling seamless transition when necessary. **4x SFP25G** • 2 primary and 2 backup inputs per input card • Standard: Supports SMPTE ST 2110 (-10, -20) and SMPTE 2059 (-1, -2) standards. • Backup: Supports SMPTE 2022-7 standard. • Resolutions: – Max resolution: 4096×2160@60Hz – Min resolution: 800×600@60Hz • SDP management: Supports VESA standard input resolution. • NMOS management: NMOS discovery and control according to standards IS-04 and IS-05 • Color gamut: BT.601/BT.709/BT.2020 • IP address: IPv4 DHCP and static IP • Multicast protocol: IGMPv3, IGMPv2 • Ethernet: – 25 GbE IEEE 802.3cc (25GBASE-LR) – 25 GbE IEEE 802.3by (25GBASE-SR) **Port Configuration** You can configure the port information through the following three methods: • Connect to the NMOS management software for visualized configuration. • Import the SDP file for offline configuration. • Through the event management software PixelFlow – Video stream destination IP: port (primary/backup) – Video source IP (primary/backup) – Port local IP (primary/backup)

Output Card	
Q8_HDMI2.0+12G-SDI+Fiber Output Card	 The 4x HDMI 2.0 and 4x 12G-SDI connectors are divided into 4 groups. Each group includes 1x HDMI 2.0 and 1x 12G-SDI connectors, and one connector copies the output of the other. The 12G-SDI connector supports only standard resolutions under the protocol. When the HDMI 2.0 connector is set to a custom resolution, the 12G-SDI connector does not output. • Connector 1 (HDMI 2.0) and connector 5 (12G-SDI) are in a group. • Connector 2 (HDMI 2.0) and connector 6 (12G-SDI) are in a group. • Connector 3 (HDMI 2.0) and connector 7 (12G-SDI) are in a group. • Connector 4 (HDMI 2.0) and connector 8 (12G-SDI) are in a group. **4x HDMI 2.0** • Up to 4K×2K@60Hz 8bit 4:4:4 output • Support for 8-bit and 10-bit output settings • Support for 4:2:0, 4:2:2 and 4:4:4 output settings • Support for YCbCr and RGB color space settings • Support for HDR video outputs • Support for color gamut adjustment • Support for interlaced signal output • Custom resolutions – Maximum width: 8192 pixels – Maximum height: 8192 pixels **4x 12G-SDI** • Compatible with SD-SDI, HD-SDI, 3G-SDI and 6G-SDI • Support for interlaced signal output **8x 10G OPT** • Support for single-mode and multi-mode optical outputs, transmission distance up to 10km in single mode • OPT ports copy outputs on video connectors – OPT 1 and OPT 2 copy the output on connector 1 or 5. – OPT 3 and OPT 4 copy the output on connector 2 or 6. – OPT 5 and OPT 6 copy the output on connector 3 or 7. – OPT 7 and OPT 8 copy the output on connector 4 or 8. **Status LEDs** Each HDMI output connector has a status LED which indicates the connection status of backend device. The 12G-SDI and optical port do not have status LEDs. • On: The output connection is normal. • Off: The output connection is abnormal.

Control Card



ETHERNET

2x Neutrik Gigabit Ethernet ports

- The two Ethernet ports work as a copy channel for each other.
- Connect to the U5, U5 Pro or control computer.
- Transmit the input view information to the control computer or U5/U5 Pro event controller.
- Support control by central control command.

MVR

2x HDMI 2.0

Connect to the monitor to display the Multiviewer image in copy or independent mode.

- In independent mode, the two HDMI connectors are used to display two different MVR images.
- In copy mode, HDMI 2 copies the output on HDMI 1.

USB 3.0

1x USB 3.0

- Export device logs.
- Update the device and perform system repairs.

AUDIO

1x 3.5mm audio input, 1x 3.5mm audio output

- IN for external audio input connection.
- OUT for audio output.

Dante (reserved)

2x digital network audio ports for audio input and output.

- RJ45 port
- Support network audio input and output.
- Support 64x64 audio swapping.

GENLOCK

1x GENLOCK IN, 1x GENLOCK LOOP

Support Bi-Level and Tri-Level.

- GENLOCK IN: Accept the external sync signal.
- GENLOCK LOOP: Loop the sync signal.

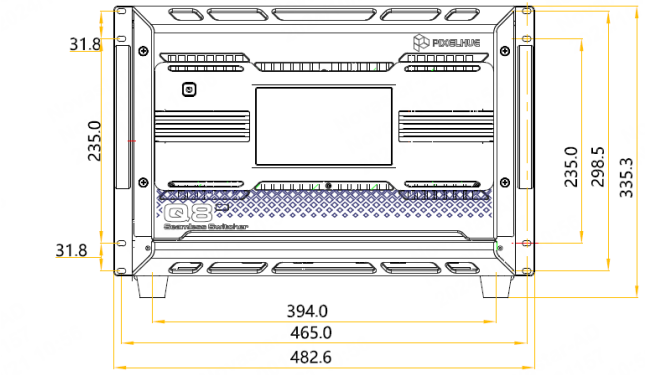
Power Connector

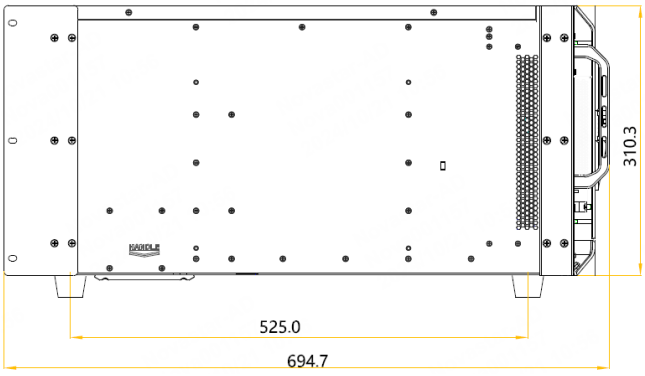
Support 2 primary and 1 backup power supplies. Before powering on the device, connect at least two power supplies.

Power specifications: 100-240V~, 50/60Hz, 10A-5A

Dimensions

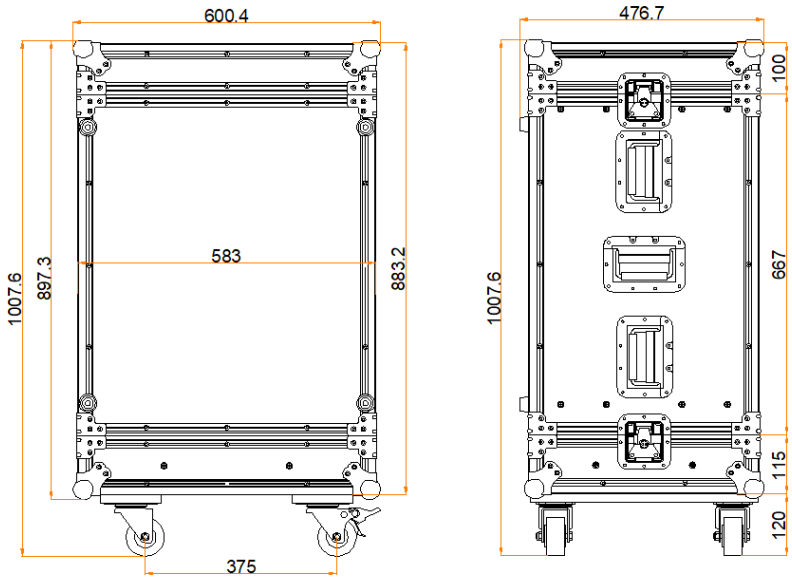
Device Dimensions





Tolerance: ±0.5 Unit: mm

Flight Case Dimensions

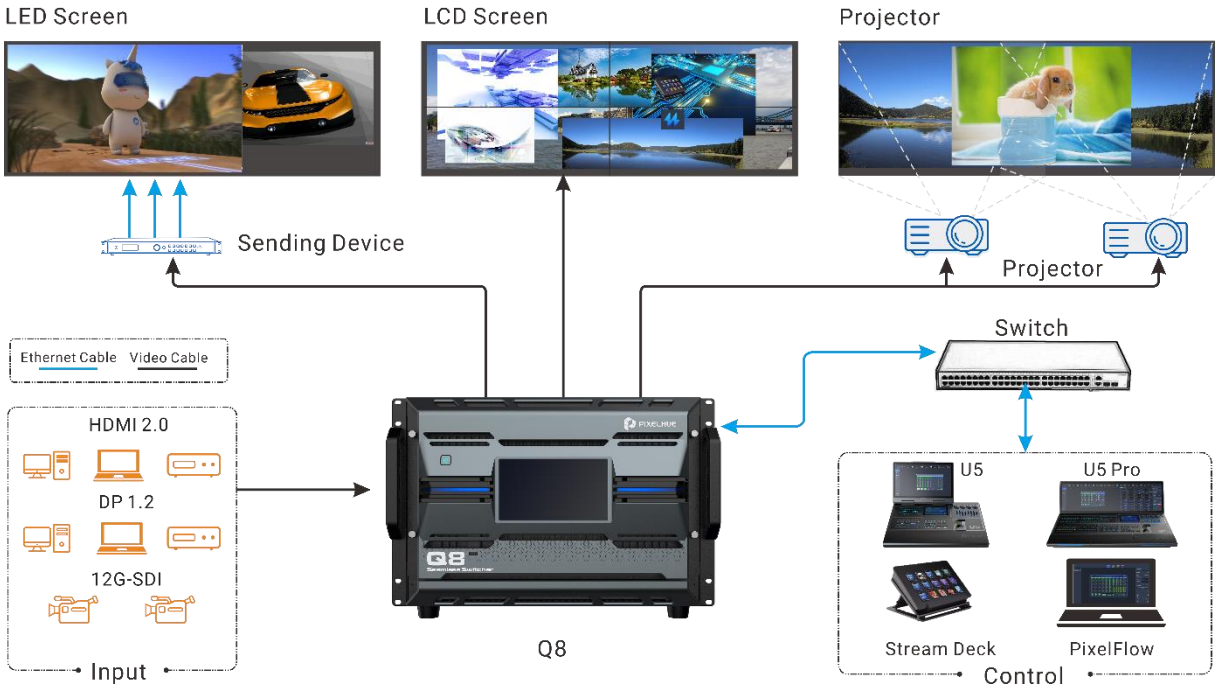


Tolerance: ±5 Unit: mm

Note

If you require detailed dimensions and drawings of the flight case, please contact PIXELHUE customer service team.

Applications



Specifications

Electrical Specifications	Power connector	100-240V~, 50/60Hz
	Power consumption (full loaded)	1400 W
Operating Environment	Temperature	0°C to 50°C (32°F to 122°F)
	Humidity	0% RH to 80% RH, non-condensing
Storage Environment	Temperature	−20°C to +60°C (−4°F to +140°F)
	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	482.6 mm × 694.7 mm × 335.3 mm
	Net weight	42.6 kg / 93.9 lbs (fully loaded without accessories)
	Gross weight	99.7 kg / 219.8 lbs (fully loaded with accessories and flight case) Note: It is the total weight of the product, accessories, and packing materials packed according to the packing specifications.
Packing Information	Flight case	1007.6 mm × 600.4 mm × 476.7 mm
	Accessories	3x Power cords, 1x Screwdriver, 2x Ethernet cables 1x Quick Start Guide, 1x Safety Manual, 1x Customer Letter, 1x Certificate of Approval
Noise Level (typical at 25°C/77°F)		45 dB (A)

Notes and Cautions

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Others

This is Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

The product can be mounted in a standard 19-inch rack capable of withstanding at least four times the total weight of the mounted equipment. Eight M6*16 screws should be used to fix the product.

This product can only be placed horizontally. Do not mount vertically or upside-down.

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