

Colorlight

# VX12F

LED Video Controller Specification V1.00



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# 01 PRODUCT INTRODUCTION

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## Revision History

| Version | Date       | Description     |
|---------|------------|-----------------|
| V1.00   | 2025/08/01 | Initial release |

### 1.1 Overview

The VX12F is a video processor designed for long-distance deployment, offering an efficient and simplified fiber optic output solution that is ideal for applications such as fiber optic transmission via one device with multiple screens. The VX12F adopts a pure fiber optic output solution, which simplifies output cabling, reduces the number of device nodes, and enhances overall system reliability. In addition, it provides comprehensive playback control and monitoring functions to help users efficiently manage display content. The VX12F can be widely applied in stadiums, event venues, public information displays, commercial advertising, exhibitions, and stage performances.

The VX12F features two 12G-SDI and two HDMI 2.0 ultra-HD video input ports, supporting six 2.5G fiber optic outputs. It supports a maximum load capacity of 7.86 million pixels, with a maximum width of 16,384 pixels and a maximum height of 8,192 pixels. The device delivers outstanding image processing performance, handling 8/10/12-bit video input and providing 8/10-bit high-quality output. With HDR technology, it produces delicate and realistic visual effects. It also supports image cropping and high-fidelity scaling. In addition, the VX12F offers reliable and convenient operation and maintenance management by integrating multiple

redundancy mechanisms such as HD preview monitoring, input source hot backup, processor redundancy, and fiber backup, ensuring stable performance across various deployment scenarios.

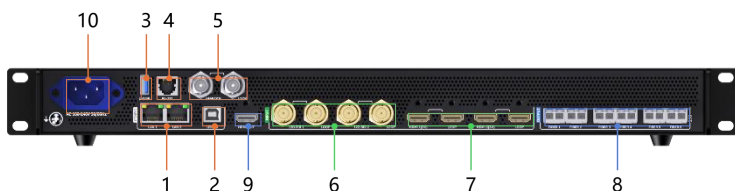
## 1.2 APPEARANCE

### Front Panel



| No. | Name         | Description   |
|-----|--------------|---|
| 1   | LCD          | Displays device status and provides menus for device control.   |
| 2   | Knob         | Navigate through menu items, tune parameters, or confirm selection.   |
| 3   | ESC          | Press this button to return to the previous interface or exit the current interface. Hold down the knob and ESC for 3 seconds to lock/unlock the front panel buttons. |
| 4   | Power Switch | Set the power switch to "I" to turn on the device, or to "O" to turn it off.  |

### Rear Panel



| No.           | Name      | Description  |
|---------------|-----------|--|
| <b>CONFIG</b> |           |  |
| 1             | LAN1/LAN2 | <ul style="list-style-type: none"> <li>2 × RJ45 Gigabit Ethernet ports, both can be connected to a PC for device control.</li> </ul> |

|              |            |   |
|--------------|------------|---|
|              |            | <ul style="list-style-type: none"> <li>Supports bridge (cascade multiple VX12F devices to configure a VLAN).</li> </ul>   |
| 2            | USB IN     | USB 2.0 Type-B, connects to a PC for device configuration.  |
| 3            | U-DISK     | Reserved for future use.  |
| 4            | RS-232     | RJ11 (6P6C) connector for central controller connection.  |
| 5            | GENLOCK    | 2 × BNC male connectors for sync signal input and loop out. Support frame rates from 23.98Hz to 60Hz, blackburst, Bi-level, and Tri-level.  |
| <b>INPUT</b> |            |   |
| 6            | 2×12G-SDI  | <ul style="list-style-type: none"> <li>Compatible with 6G-SDI, 3G-SDI (Level A/B), and HD-SDI.</li> <li>Supports SMPTE ST 2082-1 (12G), ST 2081-1 (6G), ST 424 (3G), and ST 292 (HD) video input.</li> <li>Supports up to 4096×2160@60Hz video input per port.</li> <li>Custom EDID not supported.</li> <li>10-bit video input.</li> <li>Inputs at 23.98Hz~240Hz.</li> <li>Supported color format: YCbCr422.</li> <li>De-Interlace processing.</li> </ul>   |
|              | SDI_LOOP   | <ul style="list-style-type: none"> <li>2×12G-SDI_LOOP with loop out.</li> </ul>   |
| 7            | 2×HDMI 2.0 | <ul style="list-style-type: none"> <li>HDMI 1.4, HDMI 1.3 compliant.</li> <li>Supports up to 4096 × 2160@60Hz or 8192 × 1080@60Hz video input; max. pixel clock frequency: 600MHz.</li> <li>Define custom resolution via EDID. Max. width: 4,096 pixels; max. height: 4,096 pixels.</li> <li>Video input: max. width: 8,192 pixels; max. height: 8,192 pixels.</li> <li>8/10/12-bit video input. HDR10, HLG supported.</li> <li>Inputs at 23.98Hz~240Hz.</li> <li>Supported color formats: RGB, YCbCr444, YCbCr422.</li> <li>HDCP2.2, HDCP1.4.</li> <li>Interlaced signal input not supported.</li> </ul> |
|              | HDMI_LOOP  | <ul style="list-style-type: none"> <li>2×HDMI 2.0_LOOP with loop out.</li> </ul>  |

| OUTPUT       |             |  |
|--------------|-------------|--|
| 8            | FIBER 1~6   | <ul style="list-style-type: none"> <li>• 6×2.5G fiber port</li> <li>- Comes with SFP+ optical modules. The transmission distance is 2km.</li> <li>• Works with a 2.5G fiber optic transceiver to convert into 12 Gigabit Ethernet ports, supporting Ethernet port loop redundancy.</li> <li>• The device supports a total load capacity of 7.86 million pixels, with a maximum width of 16,384 pixels and a maximum height of 8,192 pixels.</li> <li>• At 60Hz 8-bit output, the load capacity of each Ethernet port is up to 650,000 pixels.</li> </ul> |
| 9            | HDMI OUT    | <ul style="list-style-type: none"> <li>• 1×HDMI 2.0, outputs a 2K/4K image depending on monitor resolution.</li> <li>• Used for monitoring screens and previewing video inputs.</li> </ul>   |
| Power supply |             |  |
| 13           | AC 100-240V | Power input; AC 100-240V; 50/60Hz.   |

## 02 FEATURES

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### 4K Inputs

- 2×12G-SDI + 2×12G-SDI\_LOOP
- 2×HDMI2.0 + 2×HDMI2.0\_LOOP

### Large Load Capacity

- Loads up to 7.86 million pixels; max. width: 16,384; max. height: 8,192.
- 6×2.5G fiber outputs
  - The FIBER 1 – 6 ports support 2.5 Gb/s fiber optic transceivers, converting to 12 Gigabit Ethernet outputs.
  - Any of the 12 Ethernet ports corresponding to the fiber outputs can be mutually backed up.
- 1×HDMI 2.0 output
  - Connects to a 2K/4K monitor for preview and monitoring.

### Superior Image Quality

- 4096×2160@60Hz
- HDR10/HLG supported; SMPTE ST 2086/2084 compliant.
- Color depth: 8/10/12-bit input; 8/10-bit output.
- Max. frame rate: 240Hz.

### Versatility

- 2 work modes
  - Video Processor: When used as a video processor, the VX12F supports picture-in-picture (PIP), scaling, scene management, and other video processing functions. The latency is 2–3 frames under normal mode and 1 frame when low-latency mode is enabled.
  - Bypass Mode: When used as independent main controller, the VX12F disables video processing and outputs video to the receiving card with 0 frame latency.

## Robust Video Processing

- Multi-layer display: Supports 3 × 4K layers and allows for image splicing, Picture-in-Picture (PiP), high-quality scaling, and cropping.
- Adjustable hue, color temperature, saturation, black level, and contrast.
- EDID library: predefined custom EDID files.
- Supported color formats: RGB, YCbCr444, YCbCr422.
- Adjustable layer priority and scaling.
- Precise color management.
- Advanced test mode with up to 15 built-in patterns, capable of displaying any color.

## 4K Monitoring

- 1×HDMI 2.0, outputs a 2K/4K image depending on monitor resolution.
- Software-based preview and monitoring via LAN.
- Multiple modes: Allow simultaneous monitoring of all inputs and outputs. Support independent preview of screens or any input.
- Supports previewing automatically or manually selected audio output.
  - Auto: Automatically selects the valid audio from the topmost layer.
  - Manual: Allows custom selection of the output audio source.

## Intuitive Interaction

- Compatible with iSet, providing professional functionalities.
- 128 presets with custom file tags and colors for easy management.
- Preset loop.

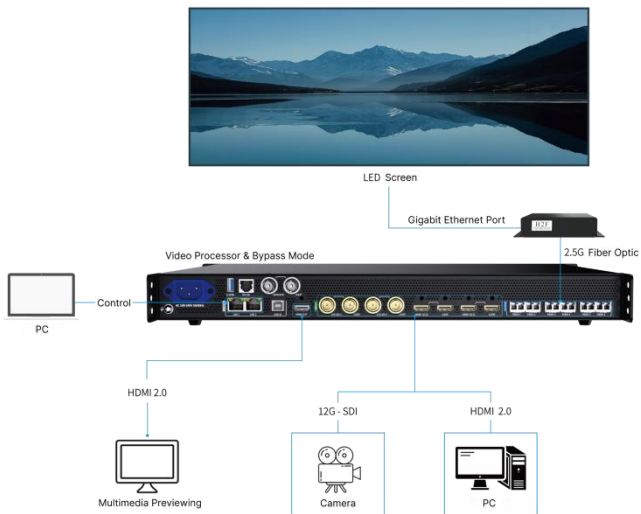
## Redundancy

- Output port loop redundancy. Ensure that the screen does not go black when a signal link fails.
- Processor redundancy: Allows automatic switching to the backup device if failure occurs to the primary device.
- Video input hot backup: Ensures seamless switching to the backup signal.

# 03 APPLICATIONS

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## Video Processor & Bypass Mode



## 04 REFERENCE SIGNAL FORMATS

| 12G-SDI            |                        |                          |           |   |
|--------------------|------------------------|--------------------------|-----------|---|
| Common Resolutions |                        | Color Space              | Bit Depth | Frame Rates (Hz)                                |
| 12G-SDI            | 4096×2160<br>3840×2160 | YCbCr422                 | 8/10      | 50/59.94/60                                     |
| 6G-SDI             | 4096×2160<br>3840×2160 | YCbCr422                 | 8/10      | 23.98/24/25/29.97/30                            |
| 3G-SDI             | 2048×1080<br>1920×1080 | YCbCr422                 | 8/10      | 50/59.94/60                                     |
| HD-SDI             | 1920×1080i             | YCbCr422                 | 8/10      | 50/59.94/60                                     |
| HD-SDI             | 2048×1080<br>1920×1080 | YCbCr422                 | 8/10      | 23.98/24/25/29.97/30                            |
| HD-SDI             | 1280×720               | YCbCr422                 | 8/10      | 23.98/24/25/29.97/30/50/59.94/60                |
| HDMI 2.0           |                        |                          |           |   |
| Common Resolutions |                        | Color Space              | Bit Depth | Frame Rates (Hz)                                |
| DCI 4K             | 4096×2160              | YCbCr422                 | 8/10      | 23.98/24/25/29.97/30/50/59.94/60                |
|                    |                        | YCbCr444/RGB             | 8         |   |
|                    |                        | YCbCr444/RGB             | 10        |   |
| UHD                | 3840×2160              | YCbCr422                 | 8/10      | 23.98/24/25/29.97/30/50/59.94/60                |
|                    |                        | YCbCr444/RGB             | 8         |   |
|                    |                        | YCbCr444/RGB             | 10        |   |
| QHD                | 2560×1440              | YCbCr422                 | 8/10      | 23.98/30/50/59.94/60/100/119.88/<br>120/144     |
|                    |                        | YCbCr444/RGB             | 8         |   |
|                    |                        | YCbCr444/RGB             | 10        | 23.98/30/50/59.94/60/100                        |
| 2K                 | 2048×1152              | YCbCr422<br>YCbCr444/RGB | 8/10      | 23.98/24/30/50/59.94/60/100/120/<br>144         |
| WUXGA              | 1920×1200              |                          |           |   |
| FHD                | 1920×1080              |                          |           |   |
| SXGA               | 1280×1024              | YCbCr422                 | 8/10      | 23.98/24/30/50/59.94/60/100/120/<br>144/200/240 |

|  |  |               |  |  |
|--|--|---------------|--|--|
|  |  | YCbCr444/ RGB |  |  |
|--|--|---------------|--|--|

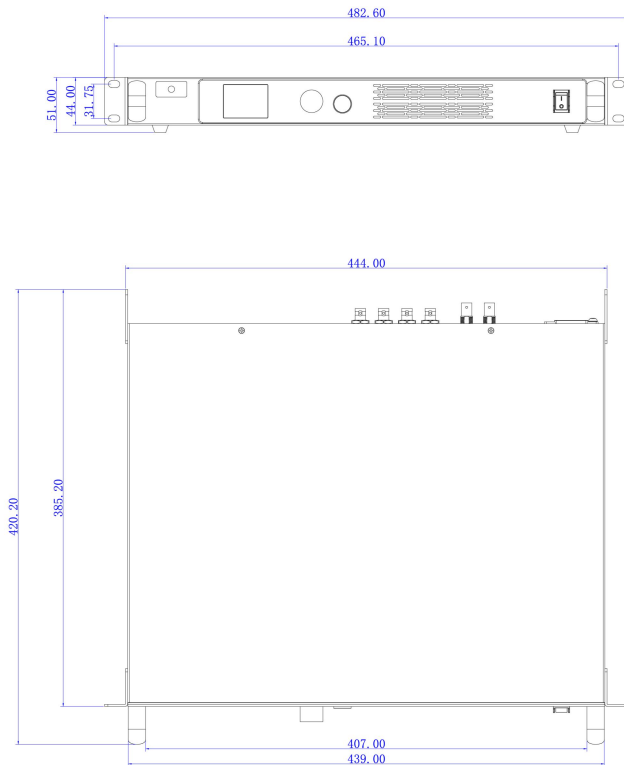
## 05 DEVICE SPECIFICATIONS

| Dimensions (W×H×D)               |  |       |
|----------------------------------|--|-------|
| Device                           | 482.6mm (19.0") × 44.0mm (1.7") × 420.20mm (16.5"); 1U; w/o rubber feet    |       |
| Packaging                        | 550.0mm (21.7")×115.0mm (4.5")×490.0mm (19.3")                             |       |
| Weight                           | Net: 4.8kg (10.58lbs)  |       |
| Electrical Parameters            |  |       |
| Power Supply                     | AC 100-240V, 50/60Hz   |       |
| Power Consumption                | 75W  |       |
| Operating and Storage Conditions |  |       |
| Operating                        | Temperature: -20°C~50°C (-4°F~122°F)<br>Humidity: 0-90%RH, non-condensing  |       |
| Storage                          | Temperature: -30°C~80°C (-22°F~176°F)<br>Humidity: 0-90%RH, non-condensing |       |
| Package                          |  |       |
| What' s Included                 | VX12F  | 1 PC  |
|                                  | After-sales service card   | 1 PC  |
|                                  | Gigabit Ethernet cable   | 1 PC  |
|                                  | USB-A/B cable  | 1 PC  |
|                                  | Power cord   | 1 PC  |
|                                  | HDMI 2.0 cable   | 1 PC  |
|                                  | 2.5G FIBER optical module (2.5km)  | 6 PCS |
|                                  | Ground Wire  | 1 PC  |

# 06 DIMENSIONS

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Unit: mm



# 07 STATEMENTS

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## 7.1 Certifications

FCC, IC



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

## 7.2 Legal Statement

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# Colorlight

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