Colorlight

VX20

LED Video Controller Specification V1.20

CONTENTS

01 PRODUCT INTRODUCTION

Revision History

Version	Date	Description
V1.20	2025/03/29	Added screen monitoring
V1.00	2024/10/28	Initial release

1.1 Overview

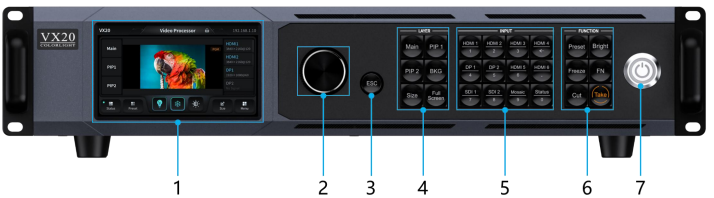
The VX20 boasts robust video processing capabilities, supporting a load capacity of up to 13.1 million pixels, with a maximum width of 16,384 pixels and a maximum height of 8,192 pixels. The device offers 3 work modes—Video Processor, Fiber Optic Transceiver, and Bypass—making it ideal for stage rentals, commercial events, and exhibitions.

The VX20 features multiple inputs (HDMI 2.0, DP 1.2, 12G-SDI, HDMI 1.4) and outputs (1G Ethernet, 10G fiber), offering exceptional image processing that supports 8/10/12-bit video input and 8/10-bit output. It also supports HDR technology, image cropping, high-fidelity video scaling, BKG, OSD, and logos. The device ensures reliable, intuitive operation and maintenance management by integrating HD Multiviewer, input hot backup, processor redundancy, data backup, fiber port redundancy, Ethernet port redundancy, dual canvas views, and multiple ports. All these make it a perfect fit for medium-to-high-end rentals, large-scale events, and fine-pitch LED screens.

The VX20 can be controlled via the front panel touch screen, iSet, and web app. The web-based control is compatible with Windows, macOS, and Linux, without extra software installation.

1.2 APPEARANCE

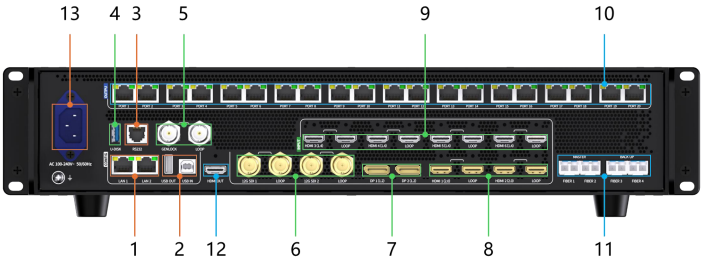
Front Panel



No.	Name	Description	
1	Touch Screen	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 exit the current interface or return to the previous interface.	
4	Layer Operation Buttons	• Main • PIP1 • PIP2	Press these LAYER buttons to select the current layer; then press the INPUT buttons to quickly select a video source for the current layer. - Steady blue indicator: Layer enabled with stable signal source. - Blinking blue indicator: Layer enabled and in edit mode. - Indicator off: Layer disabled.
		• BKG	Press this button to access the background image settings interface.
		• SIZE	Button for setting layer size or position.
		• Full Screen	Press this button to quickly scale the selected layer to full screen.

5	Input Control Buttons	• HDMI 1/2 • DP 1/2 • SDI 1/2 • HDMI 3/4/5/6 • Mosaic	Press these INPUT buttons to quickly select a video source for the current layer. - Steady blue indicator: stable signal input. - Blinking blue indicator: Signal assigned to a layer but currently offline. - Indicator off: No signal input and signal not assigned to any layer.
		• Status	Press this button to view the device status.
		• 0~9	Press these buttons to enter the corresponding numbers when the numeric field is in edit mode.
		• “←”	Delete/Backspace button.
		• “.”	Press this button to enter a separator or decimal point.
6	Function Buttons	• Preset	Press this button to select a preset.
		• Bright	Press this button to adjust brightness.
		• Freeze	Press this button to hold the final frame.
		• FN	Function for this button is user-definable.
		• Cut	Press this button to output the current PVW image to PGM without a transition effect.
		• Take	Press this button to output the current PVW image to PGM with a transition effect.
7	Power Switch	Press this button to turn the device on or off.	

Rear Panel



No.	Name	Description
CONFIG		
1	LAN1/LAN2	• 2×RJ45 Gigabit Ethernet ports, both can be connected to a PC for device control. • Supports bridge (cascade multiple VX20 devices to configure a VLAN).
2	USB IN & OUT	USB 2.0 (Type-B&Type-A); connects to a PC for device configuration and cascading.
3	RS-232	RJ11 (6P6C) connector for central controller connection.
INPUT		
4	U-DISK	Supports importing up to 32 configuration files via U-disk port.
5	GENLOCK & LOOP	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.
6	2×12G-SDI	• Compatible with 6G-SDI, 3G-SDI (Level A/B), and HD-SDI. • Supports SMPTE ST 2082-1 (12G), ST 2081-1 (6G), ST 424 (3G), and ST 292 (HD) video input. • Supports up to 4096×2160@60Hz video input per port. • Custom EDID not supported. • 10-bit video input. • Inputs at 23.98Hz~240Hz. • Supported color format: YCbCr422. • De-Interlace processing (12G-SDI 1 only).
	SDI_LOOP	• 2×12G-SDI_LOOP with loop out.

7	2×DP 1.2	• DP 1.1 compliant. • Supports up to 4096×2160@60Hz or 8192×1080@60Hz video input; max. pixel clock frequency: 600MHz. • Define custom resolution via EDID. Max. width: 4,096 pixels; max. height: 4,096 pixels. • Video input: Max. width: 8,192 pixels; max. height: 8,192 pixels. • 8/10/12-bit video input. HDR10, HLG supported. • Inputs at 23.98Hz~240Hz. • Supported color formats: RGB, YCbCr444, YCbCr422. • HDCP2.2, HDCP1.4. • Embedded audio input. • Interlaced signal input not supported.
8	2×HDMI 2.0	• HDMI 1.4, HDMI 1.3 compliant. • Supports up to 4096×2160@60Hz or 8192×1080@60Hz video input; max. pixel clock frequency: 600MHz. • Define custom resolution via EDID. Max. width: 4,096 pixels; max. height: 4,096 pixels. • Video input: Max. width: 8,192 pixels; max. height: 8,192 pixels. • 8/10/12-bit video input. HDR10, HLG supported. • Inputs at 23.98Hz~240Hz. • Supported color formats: RGB, YCbCr444, YCbCr422. • HDCP2.2, HDCP1.4. • Interlaced signal input not supported.
	HDMI_LOOP	• 2×HDMI 2.0_LOOP with loop out.
9	4×HDMI 1.4	• Max. resolution: 4096×1080@60Hz or 4096×2160@30Hz; min. resolution: 800×600@60Hz. • Max. pixel clock frequency: 330MHz. • Define custom resolution via EDID. Max. width: 4,096 pixels; max. height: 4,096 pixels. • 8-bit video input. HDR not supported. • Inputs at 23.98Hz~120Hz. • Supported color formats: RGB, YCbCr444, YCbCr422. • HDCP1.4. • Embedded audio input (HDMI 3 only). • Interlaced signal input not supported.
	HDMI_LOOP	• 4×HDMI 1.4_LOOP with loop out.

<table>
<tr><th colspan="3">OUTPUT</th></tr>
<tr><td>10</td><td>PORT 1-20</td><td>
• Total load capacity: 13.1 million pixels; max. width: 16,384 pixels; max. height: 8,192 pixels.
<table>
<tr><th>Color Depth / Frame Rate</th><th>8-bit</th><th>10-bit</th></tr>
<tr><td>60Hz</td><td>13.1 million pixels</td><td>9.8 million pixels</td></tr>
<tr><td>120Hz</td><td>6.55 million pixels</td><td>4.9 million pixels</td></tr>
<tr><td>240Hz</td><td>4.9 million pixels</td><td>2.45 million pixels</td></tr>
</table>
• 8-bit@60Hz output: Loads up to 650,000 pixels per port.
• Transmission distance: The recommended maximum cable (CAT5e) run length is 100 meters.
• Ethernet port loop redundancy.
</td></tr>
<tr><td>11</td><td>FIBER 1-4</td><td>
• 4×10G fiber port.
- SFP+ optical modules are optional. The transmission distance depends on the specification of the optical module.
• FIBER 1/2
- When used with Ethernet ports, FIBER is prioritized for output. FIBER 1 corresponds to Ethernet ports 1~10; FIBER 2 corresponds to ports 11~20.
- When FIBER 1 or FIBER 2 is not in use, 20 Ethernet ports will be used for output by default.
- FIBER 1/2 serve as the input port automatically in the Fiber Optic Transceiver mode; FIBER 1/2 serve as the output port in the Video Processor mode or the Bypass mode.
• FIBER 3/4
- Default to the Backup mode, with the option to switch the Copy mode.
- FIBER 3/4 backs up or copies the data from FIBER 1/2 respectively.
</td></tr>
<tr><td>12</td><td>HDMI OUT</td><td>
• 1×HDMI 2.0, outputs a 2K/4K image depending on monitor resolution.
• Used for previewing the output of PVW/PGM images, video inputs, or presets.
</td></tr>
<tr><th colspan="3">Power supply</th></tr>
<tr><td>13</td><td>AC 100-240V</td><td>Power input; AC 100-240V; 50/60Hz.</td></tr>
</table>

02 FEATURES

Various Inputs

- 2×12G-SDI + 2×LOOP
- 2×DP 1.2
- 2×HDMI 2.0 + 2×LOOP
- 4×HDMI 1.4 + 4×LOOP (* Input 2×HDMI 1.4 or 4×HDMI 1.3 simultaneously)

Large Load Capacity

- Loads up to 13.1 million pixels; max. width: 16,384; max. height: 8,192.
- 20×Gigabit Ethernet outputs or 4×10G fiber outputs
  - FIBER 1/2 (primary outputs) corresponds to Ethernet ports 1~10 and 11~20 respectively. When used with Ethernet ports, FIBER is prioritized for output.
  - FIBER 3/4 (backup outputs) backs up or copies FIBER1/2.
- 1×HDMI 2.0 output, connects to a 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

- 3 work modes
  - Video Processor: The VX20 performs image processing, allowing 3 video inputs for output to the receiving card with 1 frame delay.
  - Fiber Optic Transceiver: The VX20 serves as a fiber optic transceiver with 20 Ethernet ports. FIBER 1/2 work as input ports.
  - Bypass: The VX20 serves as a video sender, allowing 1 of the video inputs for output to the receiving card with 0 frame delay.

Robust Video Processing

- Dual canvas views: PVW&PGM, PGM Only
  - PVW (Preview) is the canvas for editing images, and PGM (Program) is for output monitoring.
  - PVW&PGM: The PVW image can be edited and previewed. Once verified, it can be displayed on screen via the Take/Cut button.
  - PGM Only: Modifications to layers will be simultaneously applied to the screen.
  - The load capacities for these two modes are 13.1 million pixels each.
- 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 transparency, priority and scaling.
- Fade in/out.
- Precise color management.

Diversified Display

- Image library
  - Supports uploading PNG or JPG images to VX20 (total storage: 1GB).
  - Images in library are available for use in the BKG/Logo layer.
- BKG (UHD/solid color)
  - Does not use output layer. Supports 4 BKG presets.
  - Pixel-to-pixel display (max. width: 16,384; max. height: 8,192).
- OSD
  - Does not use output layer. Supports 4 OSD presets.
  - Resolution: Up to 2.07 million pixels (max. width: 512 pixels; max. height: 512 pixels).
  - Scrolling text with custom direction, speed, and font style.
  - Adjustable OSD transparency.
- Logo
  - Does not use output layer. Supports 10 logo presets.

- Supports PNG image uploads, allowing display of irregular logos with a maximum resolution of 512×512 pixels.
- Adjustable logo transparency.

- Test pattern: Up to 15 built-in test patterns.

4K Monitoring

- 1×HDMI 2.0, outputs a 2K/4K image depending on monitor resolution.
- Software-based preview and monitoring via LAN.
- HD front panel: Preview without the need for any external device.
- 5 modes: Allow simultaneous monitoring of all inputs and outputs. Support independent preview of PVW, PGM, any input, or preset.
- 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

- Cross-platform web app supports screen configuration, seam correction, and screen management, eliminating the need for multiple software.
- Compatible with iSet, providing professional functionalities.
- Seamless switching between 2 operation modes (PVW&PGM or PGM Only), offering flexibility for different application scenarios.
- Screen parameter library supports saving up to 200 parameter files.
- 1000 presets with custom file tags and colors for easy management.
- Preset loop.

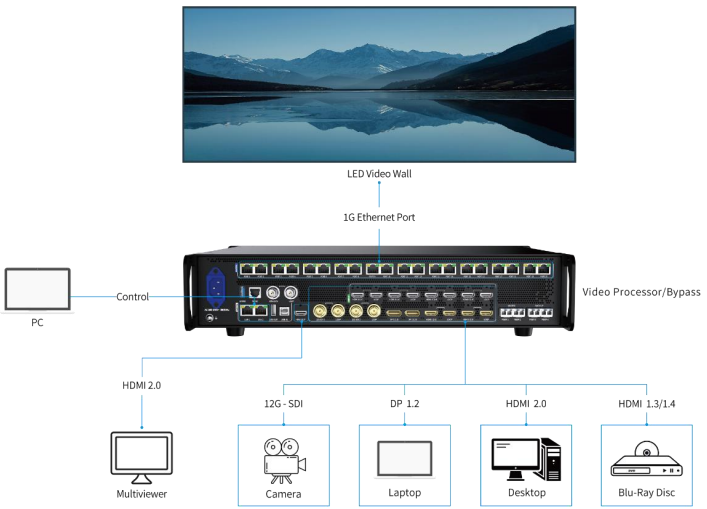
Redundancy

- Ethernet port loop redundancy.
- Built-in fiber redundancy ports (FIBER 3/4 for FIBER 1/2).
- Processor redundancy: Allows automatic switching to the backup device if failure occurs to the primary device.
- Device data backup: Up to 5 sets of data can be stored.
- Video input hot backup: Ensures seamless switching to the backup signal.
- Screen status monitoring: Monitors the signal status/format, hardware connection, temperature, humidity, fan, voltage, and power supply.

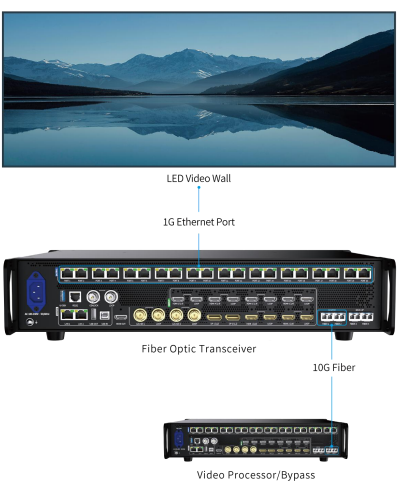
(* Special receiving cards might be required. Please contact Colorlight.)

03 APPLICATIONS

Video Processor Mode & Bypass Mode



Fiber Optic Transceiver Mode



04 REFERENCE SIGNAL FORMATS

12G-SDI				
Common Resolutions		Color Space	Bit Depth	Frame Rates (Hz)
12G-SDI	4096×2160 3840×2160	YCbCr422	8/10	50/59.94/60
6G-SDI	4096×2160 3840×2160	YCbCr422	8/10	23.98/24/25/29.97/30
3G-SDI	2048×1080 1920×1080	YCbCr422	8/10	50/59.94/60
HD-SDI	1920×1080i	YCbCr422	8/10	50/59.94/60
HD-SDI	2048×1080 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

DP 1.2				
Common Resolutions		Color Space	Bit Depth	Frame Rates (Hz)
DCI4K	4096×2160	YCbCr422 YCbCr444/ RGB	8/10	23.98/24/25/29.97/30/50/59.94/60
UHD	3840×2160			
QHD	2560×1440	YCbCr422 YCbCr444/ RGB	8/10	23.98/24/25/29.97/30/50/59.94/60/ 100/120/144
2K	2048×1152			
WUXGA	1920×1200			
FHD	1920×1080			
SXGA	1280×1024	YCbCr422 YCbCr444/ RGB	8/10	23.98/24/30/50/59.94/60/100/120/ 144/200/240
HD	1280×720			

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	23.98/24/25/29.97/30/50
UHD	3840×2160	YCbCr422	8/10	23.98/24/25/29.97/30/50/59.94/60
		YCbCr444/RGB	8	
		YCbCr444/RGB	10	23.98/24/25/29.97/30/50
QHD	2560×1440	YCbCr422	8/10	23.98/30/50/59.94/60/100/119.88/120/144
		YCbCr444/RGB	8	
		YCbCr444/RGB	10	23.98/30/50/59.94/60/100
2K	2048×1152	YCbCr422 YCbCr444/RGB	8/10	23.98/24/30/50/59.94/60/100/120/144
WUXGA	1920×1200			
FHD	1920×1080			
SXGA	1280×1024	YCbCr422 YCbCr444/ RGB	8/10	23.98/24/30/50/59.94/60/100/120/144/200/240
HD	1280×720			

HDMI 1.4				
Common Resolutions		Color Space	Bit Depth	Frame Rates (Hz)
DCI4K	4096×2160	YCbCr422 YCbCr444/ RGB	8	23.98/24/25/29.97/30
UHD	3840×2160			
QHD	2560×1440	YCbCr422 YCbCr444/ RGB	8	23.98/30/50/59.94/60
2K	2048×1152	YCbCr422 YCbCr444/ RGB	8	23.98/24/25/29.97/30/50/59.94/60/100/120
WUXGA	1920×1200			
FHD	1920×1080			
HD	1280×720			
SVGA	800×600			

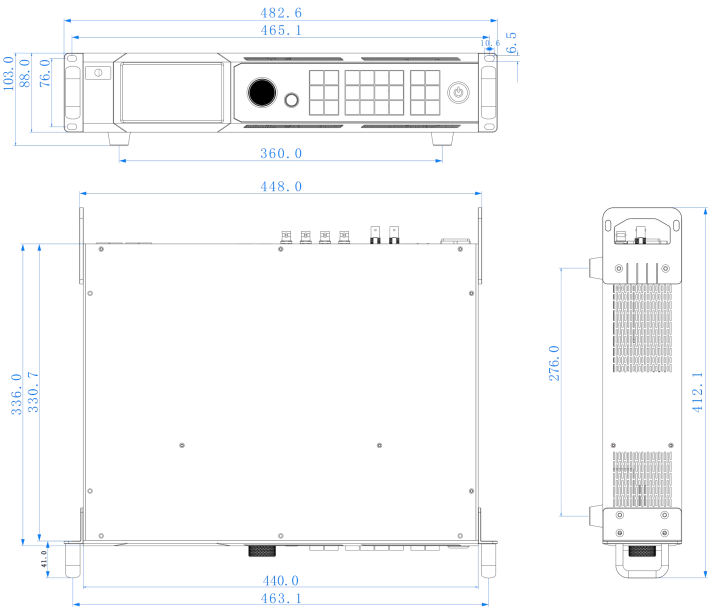
HDMI 1.3				
Common Resolutions		Color Space	Bit Depth	Frame Rates (Hz)
2K	2048×1152	YCbCr422 YCbCr444/ RGB	8	23.98/24/25/29.97/30/50/59.94/60
WUXGA	1920×1200			
FHD	1920×1080			
SXGA	1280×1024	YCbCr422 YCbCr444/ RGB	8	23.98/24/25/29.97/30/50/59.94/60/100
HD	1280×720	YCbCr422 YCbCr444/ RGB	8	23.98/24/25/29.97/30/50/59.94/60/100/120
XGA	1024×768			
SVGA	800×600			

05 DEVICE SPECIFICATIONS

Dimensions (W×H×D)		
Device	482.6mm (19.0")×88.0mm (3.5")×412.1mm (16.2"); 2U; w/o rubber feet	
Packaging	525.0mm (20.7")×150.0mm (5.9")×495.0mm (19.5")	
Weight	Net: 5.65kg (12.45lbs); gross: 9.10kg (20.06lbs)	
Electrical Parameters		
Power Supply	AC 100-240V, 50/60Hz	
Power Consumption	92W	
Operating and Storage Conditions		
Operating	Temperature: -20℃~50℃ (- 4°F~122°F) Humidity: 0-90%RH, non-condensing	
Storage	Temperature: -30℃~80℃ (-22°F~176°F) Humidity: 0-90%RH, non-condensing	
Package		
What's Included	VX20	1 PC (no built-in battery by default)
	User manual	1 PC
	After-sales service card	1 PC
	Gigabit Ethernet cable	1 PC
	USB-A/B cable	1 PC
	RJ11 to DB9 serial cable	1 PC
	Power cord	1 PC
	HDMI 2.0 cable	1 PC
	DP 1.2 cable	1 PC
	10G FIBER optical module	Optional
Flight Case	Optional	

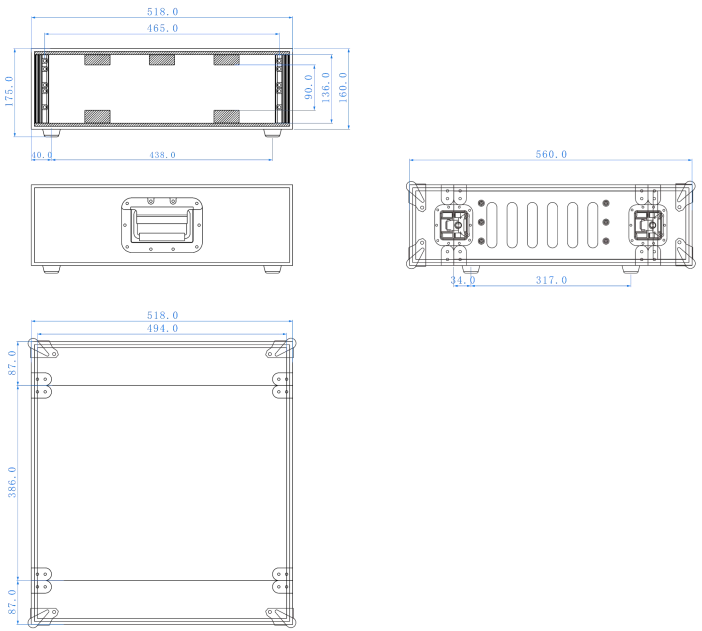
06 DIMENSIONS

Unit: mm



07 FLIGHT CASE DIMENSIONS

Unit: mm



Flight case is optional.

08 STATEMENTS

8.1 Certifications

RoHS, CCC, CE, FCC, IC, UKCA, CB, cTUVus, EAC, KCC

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.

8.2 Legal Statement

Due to possible changes in product batches and production processes, the text and pictures in the document may be adjusted and revised to match accurate product information, specifications, and features. Colorlight may make improvements and changes to this document without prior notice. Please refer to the actual product.

Thank you for choosing Colorlight Cloud Tech Ltd product. If you have any questions or suggestions during use, please contact us through official channels. We will do our utmost to provide support and listen to your valuable suggestions. For more information and updates, please visit www.colorlightinside.com or scan the QR code.

Colorlight

Official Website

Colorlight Cloud Tech Ltd

Service Phone：4008 770 775
Official Website：www.colorlightinside.com
Head Office Address: 37F-39F, Block A, Building 8, Zone C, Phase III,
Vanke Cloud City, Xili Street, Nanshan District, Shenzhen, China