Colorlight

# E120

## Receiving Card Specification V1.1.0

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## Revision History

| Version | Release Date | Description |
|---|---|---|
| V1.1.0 | February 15, 2022 | Initial release |

# 01 Introduction

### 1.1 Overview

The Colorlight E120 is a cost-effective receiving card designed to help customers reduce costs, minimize failure points, and lower failure rates. A single card supports up to 512×512 pixels and 24 groups of parallel data or 32 groups of serial data (expandable to 128). The integration of HUB connectors enhances display performance while ensuring greater reliability, convenience, and cost savings.

## 1.2 Appearance


| No. | Item | Description | |
|---|---|---|---|
| 1 | Power input 1 | Connects to a DC 3.8~5.5V power supply for the receiving card (Choose either of them) | |
| 2 | Power input 2 | | |
| 3 | Ethernet port A | RJ45 Ethernet ports for transmitting network signals. Each port can be used for input or output (auto-identified by the system). | |
| 4 | Ethernet port B | | |
| 5 | Test button | With testing program, enabling test patterns such as solid red/green/blue/white, and horizontal/vertical scanning methods. | |
| 6 | Power indicator | Steady RED: Normal power supply | |
| | Signal indicator | Blinking GREEN (once/sec) | Receiving card: Normal operation<br>Network cable: Normal connection |
| | | Blinking GREEN (4 times/sec) | Loop redundancy active; receiving card in backup mode |
| | | Blinking GREEN (10 times/sec) | Receiving card: Normal operation<br>Cabinet: Highlighted |

| | | |
|---|---|---|
| 7 | External connector | For external indicator and test button. |
| 8 | HUB connector | HUB75 data interfaces J1-J12, connecting to the LED panel (see *03 Pin Definitions* for details). |

**NOTE:**

The illustration is for reference only. Actual products may vary.

# 02 Specifications

## 2.1 Features

### Display Effect

- 8bit video input
- 240Hz high frame rate
- Color temperature adjustment
- Better grayscale at low brightness

### Calibration

- Pixel-level brightness and chroma calibration

### Easy Maintenance

- Highlighting and Numbering
- Image rotation
- Data offset
- Empty point/row/column
- Quick firmware upgrade and calibration coefficient saving

### Stable and Reliable

- Loop redundancy
- Cable status monitoring
- Firmware redundancy and readback
- 24/7 uninterrupted work

**NOTE:**

For detailed functions, see *Chapter 06 Appendix*. For further assistance, please contact Colorlight technical support.

## 2.2 Performance

### Control System

| | |
|---|---|
| Control area per card | Maximum load capacity (without calibration):<br>Common driver ICs: 256×512 pixels<br>PWM driver ICs: 512×512 pixels<br>SHIXIN driver ICs: 512×512 pixels |
| Ethernet port switching | Flexible use for either input or output |
| Grayscale level | Up to 65,536 |

### Module Compatibility

| | |
|---|---|
| Driver ICs | Common, PWM, and SHIXIN |
| Scan methods | Any scan type from static to 1/128 scan |
| Module specification | A single data group supports arbitrary routing method within 16,384 pixels |
| Cabling direction | Cascading from left to right, right to left, top to bottom, or bottom to top |
| Data groups | 24 groups of parallel RGB data;<br>32 groups of serial RGB data (expandable to 128 groups);<br>Can be freely exchanged |
| Data splitting | Common driver ICs: 2~8 splits horizontally, 2~4 splits vertically;<br>PWM & SHIXIN driver ICs: 2~8 splits horizontally or vertically |
| Empty point/row/column | Supports emptying any point, row, or column |

## Cabinet-Level Monitoring

| | |
|---|---|
| Cable monitoring | Monitors the total number of data packets and error packets, diagnosing network quality to prevent potential risks |

## Pixel-Level Calibration

| | |
|---|---|
| Brightness calibration | 8-bit |
| Chroma calibration | 8-bit |

## Others

| | |
|---|---|
| Optional | Irregular-shaped module construction |

## 2.3 Hardware

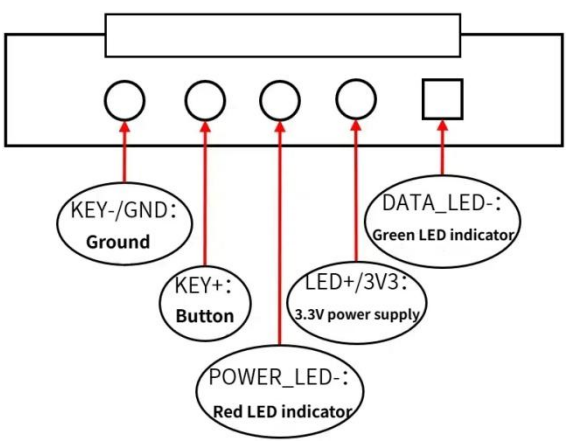
| Physical Parameters (W×H×D) | |
|---|---|
| Product dimensions | 145.2mm (5.72")×91.7mm (3.61")×18.4mm (0.72") |
| Packaging dimensions | 603.0mm (23.74")×190.0mm (7.48")×501.0mm (19.72") |
| Packing specifications | Standard blister tray, 100 cards per carton |
| Hardware connector | HUB75 |
| Transmission rate | 1 Gbps |
| Communication distance | CAT5e ⩽ 100m |
| Compatible devices | Gigabit switch, Gigabit fiber transceiver, Gigabit fiber switch |
| **Weight** | |
| Net weight | 94g (0.21lbs) |
| **Electrical Parameters** | |
| Input power | DC 3.8–5.5 V, 0.6 A |
| Rated power | 3.0 W |
| **Operating Environment** | |
| Temperature | –25°C to 75°C (–13°F to 167°F) |
| Humidity | 0–80% RH, non-condensing |
| **Storage Environment** | |
| Temperature | -40°C to 125°C (-40°F to 257°F) |
| Humidity | 0–90% RH, non-condensing |

# 03 Pin Definitions

## HUB75 Parallel Data

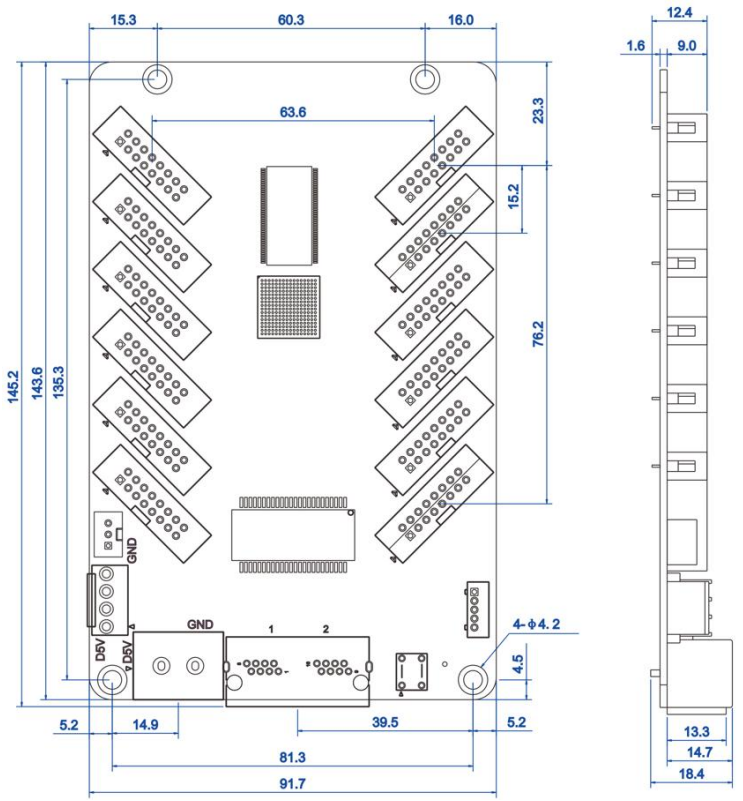
| Data Signal | | | Scan Signal | | | Control Signal | |
|---|---|---|---|---|---|---|---|
| GD1 | GND | GD2 | E | B | D | LAT | GND |
| 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 |
| RD1 | BD1 | RD2 | BD2 | A | C | CLK | OE |
| Data Signal | | | | Scan Signal | | Control Signal | |

## External Connectors



# 04 Reference Dimensions

Unit: mm




**NOTE:**

To design molds or drill mounting holes, please contact Colorlight technical support.

# 05 Statements

## 5.1 Certifications

RoHS

EMC requires a compatible cabinet design. Please contact Colorlight technical support if needed.

**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.

## 5.2 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.

# 06 Appendix

## 6.1 Function Description

### Display Effect

| | |
|---|---|
| 8bit | 8-bit video input/output: 256 grayscale levels per color, supporting up to 16,777,216 color combinations. |
| High frame rate | Adaptive frame rate technology significantly enhances image smoothness and reduces motion blurring.<br>Supports standard and non-integer frame rates: 30/50/59.94/60/100Hz.<br>Outputs high frame rate images at 120/144/240Hz. |
| Color temperature adjustment | Enhances the visual impact of the image through saturation adjustment. |
| Better grayscale at low brightness | The optimized gamma table algorithm effectively addresses grayscale loss caused by low brightness, improving grayscale performance under low brightness conditions. |
| 8bit calibration | Pixel-level brightness and chroma calibration with high prevision, which effectively eliminates LEDs color difference, ensuring an enhanced display with uniform color and brightness. |

### Easy Maintenance

| | |
|---|---|
| Cabinet highlighting | Supports highlighting the target cabinet via the control software. The cabinet borders flash, and the indicator blinking frequency changes, enabling efficient maintenance from both the front and back of the LED screen. |

| | |
|---|---|
| Quick numbering | Works with the control software to enable quickly numbering receiving cards connected to the selected network port of the sending card according to their actual routing sequence, facilitating the setting of screen mapping. |
| Image rotation | Supports rotating the image on a single cabinet by 90°/180°/270°. |
| Data offset | Supports image offset by data groups, suitable for basic irregular-shaped screens. |

## Hardware Monitoring

| | |
|---|---|
| Bit error detection | Detects data transmission status among receiving card and bit error rate, quickly identifying cabinets with hardware connection errors to facilitate maintenance. |

## Redundancy

| | |
|---|---|
| Loop redundancy | The redundant port enables an extra connection to the sending device, enhancing cascading reliability. If the primary connection fails, the backup seamlessly takes over, ensuring uninterrupted display. |
| Firmware redundancy | Secures upgrades without the risk of firmware loss due to cable disconnection or power interruption. |

Colorlight

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