Colorlight

E320 Pro

Receiving Card Specification V1.0.0

CONTENTS

Revision History

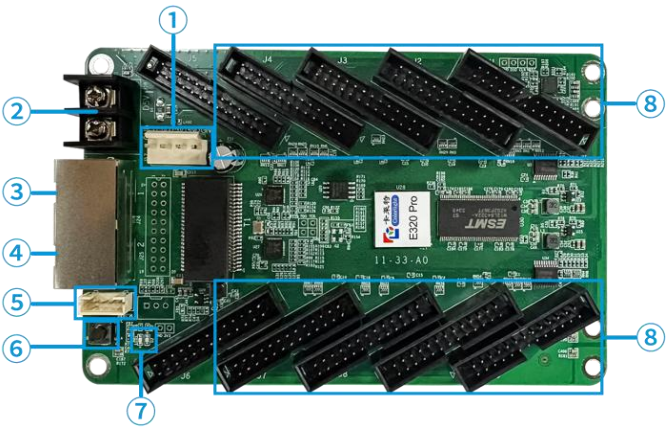
Version	Release Date	Description
V1.0.0	July 7, 2024	Initial release

01 Introduction

1.1 Overview

The Colorlight E320 Pro 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 40 groups of parallel data or 120 groups of serial data. It supports ten E320 output ports and smart module functionality. 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	External connector	For external indicator and test button.	
6	Test button	With testing program, enabling test patterns such as solid red/green/blue/white, and horizontal/vertical scanning methods.	
7	Power indicator	Steady RED: Normal power supply	
	Signal indicator	Blinking GREEN (once/sec)	Receiving card: Normal operation Network cable: Normal connection
		Blinking	Loop redundancy active; receiving

		GREEN (4 times/sec)	card in backup mode
		Blinking GREEN (10 times/sec)	Receiving card: Normal operation Cabinet: Highlighted
8	RGB real pixel data interface	RGB real pixel data interfaces J1~J10, connecting to modules. For details, see the following section *Pin Definitions*.	

NOTE:

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

02 Specifications

2.1 Features

Display Effect

- 8bit/10bit video input
- HDR10
- Full Gamma individual adjustment
- 240Hz high frame rate
- Low latency
- Infi-bit grayscale compensation
- Grayscale refinement
- Color temperature adjustment
- Better grayscale at low brightness

Calibration

- Pixel-level brightness and chroma calibration with high precision

Easy Maintenance

- Highlighting and Numbering
- Color gamut adjustment
- Image rotation
- Advanced seam correction
- Pre-storing image
- Quick firmware upgrade and calibration coefficient saving
- Monitoring of receiving card’ s ambient temperature and voltage
- Supports multi-type module (4 routing types)
- Firmware upgrade without power interruption

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	Up to 512×512 pixels (may vary in different applications)
Ethernet port switching	Flexible use for either input or output
Grayscale level	Up to 4,194,304 levels; Up to 65,536 (without Infi-bit)

Module Compatibility

Driver ICs	PWM
Scan methods	Any scan type from static to 1/128 scan
Module specification	Supports up to 1,024 pixels per scan (including cascading)
Cabling direction	Cascading from left to right, right to left, top to bottom, or bottom to top
Data groups	40 groups of parallel RGB data or 120 groups of serial RGB data which can be freely exchanged
Data splitting	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
Temperature monitoring	1 channel; monitors receiving card ambient temperature (-25℃ to 75℃) (no external devices needed)
Voltage monitoring	1 channel; monitors the voltage of the receiving card (no external devices needed)

Others

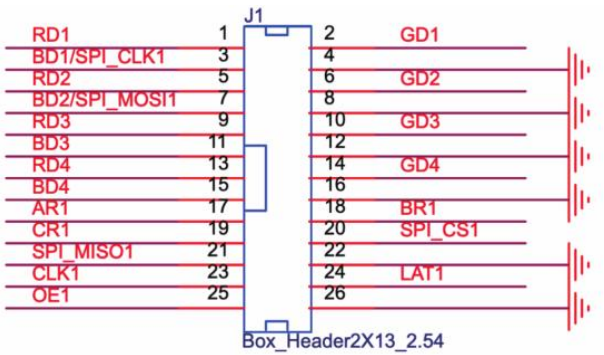
Optional	Irregular-shaped module construction

2.3 Hardware

Physical Parameters (W×H×D)	
Product dimensions	145.3mm (5.72") × 91.7mm (3.61") × 16.6mm (0.654")
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
Weight	
Net weight	98g (0.216lbs)
Electrical Parameters	
Input power	DC 3.8–5.5 V, 0.5 A
Rated power	2.0 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

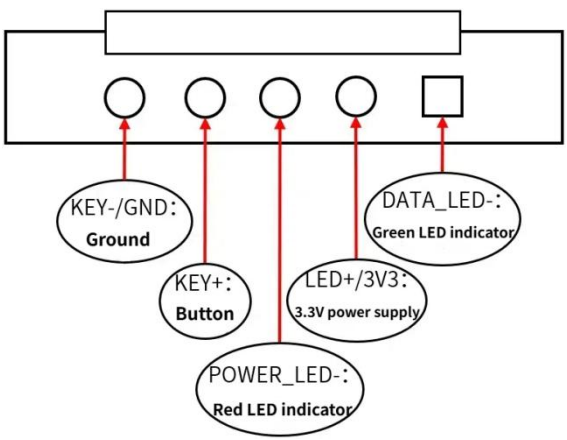
RGB Real Pixel Data



J1					
Description	**Pin Name**	**Pin No.**		**Pin Name**	**Description**
Data signal	RD1	1	2	GD1	Data signal
Data signal / LED panel Flash clock signal	BD1/SPI_CLK1	3	4	GND	Ground
Data signal	RD2	5	6	GD2	Data signal
Data signal / LED panel Flash data input signal	BD2/SPI_MOSI1	7	8	GND	Ground
Data signal	RD3	9	10	GD3	Data signal
	BD3	11	12	GND	Ground
	RD4	13	14	GD4	Data signal
	BD4	15	16	GND	Ground
Line decoding signal	AR1	17	18	BR1	Line decoding signal
	CR1	19	20	SPI_CS1	LED panel Flash chip select signal

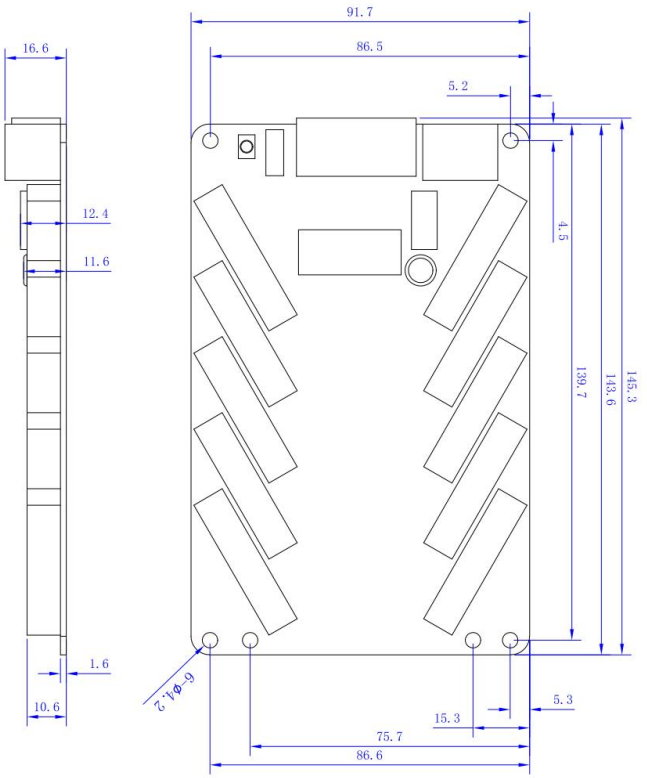
LED panel Flash data output signal	SPI_MISO1	21	22	GND	Ground
Serial shift clock	CLK1	23	24	LAT1	Latch signal
Display enable	OE1	25	26	GND	Ground

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

10bit	8bit: 16,777,216 grayscale levels. 10bit: 4x the grayscale of 8bit, delivering smoother transitions.
HDR	Enables HDR10 display when used with an HDR-capable processor, presenting images with high dynamic range, high contrast, and wide color gamut.
High frame rate	Adaptive frame rate technology significantly enhances image smoothness and reduces motion blurring. Supports standard and non-integer frame rates: 30/50/59.94/60/100Hz. Outputs high frame rate images at 120/144/240Hz.
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.
14bit 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.
Infi-bit	The dynamic grayscale compensation enhances the display grayscale and enriches image details at low gray level, ensuring a smooth grayscale transition and better display effect.
Grayscale refinement	Paired with a luminance meter and LEDVISION, it measures display performance and calibrates gray levels to eliminate grayscale banding and color cast at low levels.

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.
Color gamut adjustment	Works with the control software for quick color gamut adjustment and transformation of cabinets or screens. Supports custom adjustment and one-click reset, enabling accurate color reproduction when used with a luminance meter.
Image rotation	Supports rotating the image on a single cabinet by 90°/180°/270°.
Advanced seam correction	Works with the control software to enable quick and efficient seam correction, eliminating the perceptible bright and dark lines caused by module assembly. Supports one-click reset of seam coefficients for rental scenarios.
Pre-storing image	Supports customizing the image displayed on startup and in situations where network cable is disconnected or the video signal is lost.
Module construction	Supports 4 types of modules with different routing types, making it easy for users to construct multiple types of modules. **NOTES:** - 1 scan (including data group cascade) supports up to 1,024 pixels. The scan lines in the same data group must be consistent.

	- When using 1~2 types of routing tables, a single data group supports up to 1,024 pixels per scan. - When using 3~4 types of routing tables, a single data group supports up to 512 pixels per scan.
Upgrade without power interruption	Supports firmware upgrades without power interruption, making firmware upgrades and maintenance more convenient.

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.
Temperature monitoring	Cabinet temperature monitoring (works with M3; compatible cabinet design is required). Parameters can be sent to the host PC in real-time and viewed through the control software. Users can customize alerts for temperature anomalies.
Voltage monitoring	Cabinet voltage monitoring (works with M3; compatible cabinet design is required). Parameters can be sent to the host PC in real-time and viewed through the control software. Users can customize alerts for voltage anomalies.

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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