MRV412-S

Receiving Card

Specifications

Change History

Document Version	Release Date	Description
V1.0.0	2026-09-18	First release

Introduction

MRV412-S is a general receiving card developed by NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar). Supporting various functions such as Color Management, 18bit+, Pixel Level Brightness and Chroma Calibration, Quick Adjustment of Dark or Bright Lines, Multi-batch Adjustment, Low Latency, 3D, Individual Gamma Adjustment for RGB and 90° Image Rotation, the product can significantly improve the display effect and user experience.

The MRV412-S uses 12 standard HUB75E connectors for communication. It supports up to 24 groups of parallel RGB data and is suitable for various on-site setups.

When working with 8bit video sources, the maximum load capacity per card is:

- 512×512@60Hz (PWM driver IC)
- 512×384@60Hz (common driver IC)

Certifications

RoHS, EMC Class A

If the product lacks the certifications required for sale in the destination country or region, please contact NovaStar promptly for confirmation or assistance. Otherwise, the customer shall bear any resulting legal risks and liabilities, and NovaStar reserves the right to seek compensation.

Features

Improvements to Display Effect

- Color Management

  Support standard (Rec.709 / DCI-P3 / Rec.2020) and custom color gamuts, enabling more precise colors on the screen.

- 18bit+

  Improve the LED display grayscale by 4 times to avoid grayscale loss due to low brightness and allow for a smoother image.

- Pixel Level Brightness and Chroma Calibration

  Work with NovaStar's calibration system to calibrate the brightness and chroma of each pixel, effectively eliminating differences and enabling high consistency for both brightness and chroma.

- Quick Adjustment of Dark or Bright Lines

  The different brightness of seams caused by splicing of modules or cabinets can be corrected to improve the visual experience. The correction is easy and takes effect immediately.

- Multi-batch Adjustment

  Adjust the brightness and chroma of cabinets or modules to minimize display discrepancies caused by variations in production batches.

- Low Latency

  Low Latency is enabled by default. When enabled, the latency of the video source at the receiving card end can be reduced to 1 frame (only when using modules with driver IC with built-in RAM).

- 3D

  Work with the controller that supports 3D function to enable 3D output.

- Individual Gamma Adjustment for RGB

  Working with NovaLCT and the controller that supports this function, the receiving card supports individual adjustment to red gamma, green gamma and blue gamma, which can effectively control image non-uniformity at low grayscale conditions and white balance offset, allowing for a more realistic image.

- 90° Image Rotation

  The display image can be rotated in multiples of 90° (0°/90°/180°/270°).

- Free Image Rotation

  Support image rotation at any angle when using the dedicated MCTRL R5 controller and SmartLCT software.

- Calibration Coefficient Management

  The calibration coefficients can be uploaded, read back, saved to hardware, and erased.

- Uploading Calibration Coefficients

Upload calibration coefficients to the receiving card quickly or in a stable manner, with acceleration support if needed.

Improvements to Maintainability

- Data Group Mapping

  Display the test pattern by data group to clearly show the position of each data group within the cabinet.

- Mapping 2.0

  Within a single device, differentiate Ethernet ports using various background colors. It automatically adapts to the resolution of different cabinets to assign the appropriate controllers, ports, and receiving card numbers. This provides a clear visualization of the receiving card's physical location and wiring. Cabinet resolution mapping supports a minimum of 36×20 pixels.

- Settings of a Stored Image in the Receiving Card

  The image displayed during startup, or displayed when the Ethernet cable is disconnected or there is no video signal.

- Temperature and Voltage Monitoring

  The receiving card temperature and voltage can be monitored without using peripherals.

- Cabinet LCD

  The LCD module of the cabinet can display the temperature, voltage, single runtime and total runtime of the receiving card.

- Bit Error Detection

  Monitor the number of erroneous packets in the Ethernet data transmission of the receiving card to help troubleshoot network communication problems.

- Detection of Ethernet Cable Disconnections

  Monitor the number of times the Ethernet cable to the receiving card is disconnected, assisting in identifying potential communication link issues.

- Firmware Program Readback

  The receiving card firmware program can be read back and saved to the local computer.

- Configuration Parameter Readback

  The receiving card configuration parameters can be read back and saved to the local computer.

Improvements to Reliability

- Loop Backup

  The receiving card and controller form a loop via the primary and backup line connections. When a fault occurs at a location of the lines, the screen can still display the image normally.

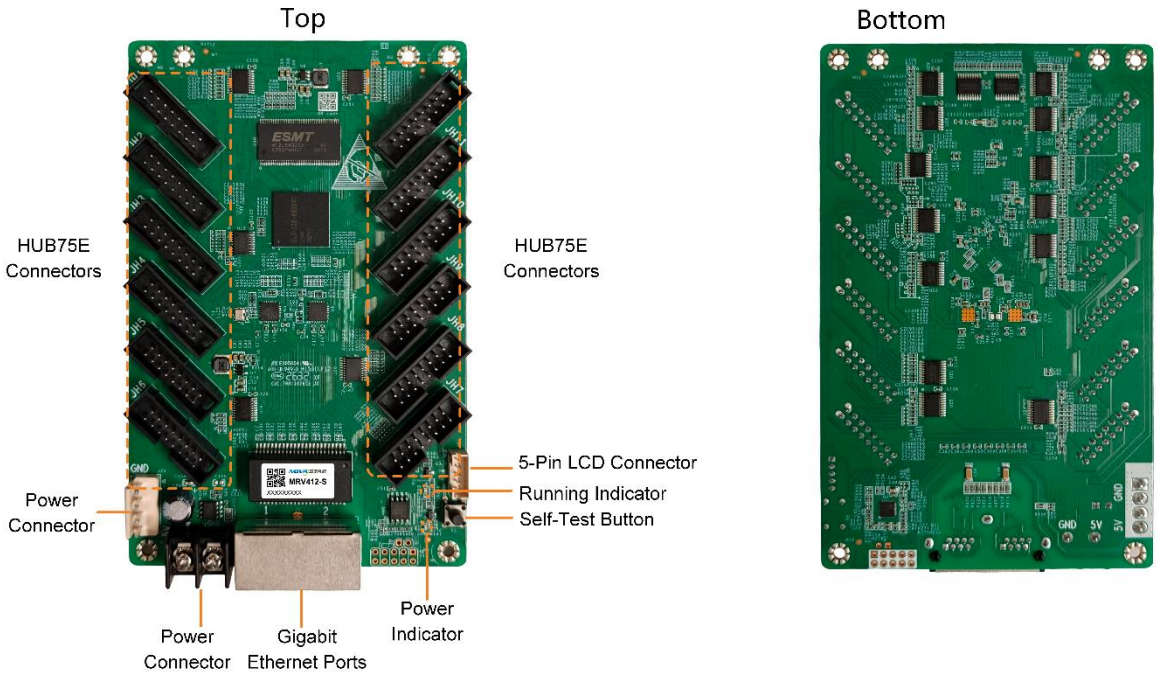
- Dual Backup of Configuration Parameters

  The receiving card configuration parameters are stored in both the application area and factory area of the receiving card at the same time. Users usually use the configuration parameters in the application area. If necessary, users can restore the configuration parameters in the factory area to the application area.

- Dual Program Backup

  Two copies of the firmware program are stored in the receiving card at the factory to avoid the problem that the receiving card may get stuck abnormally during program update.

Appearance



Product images are for reference only. The actual product may vary.

Name	Description
HUB75E Connectors	Connect to the module.

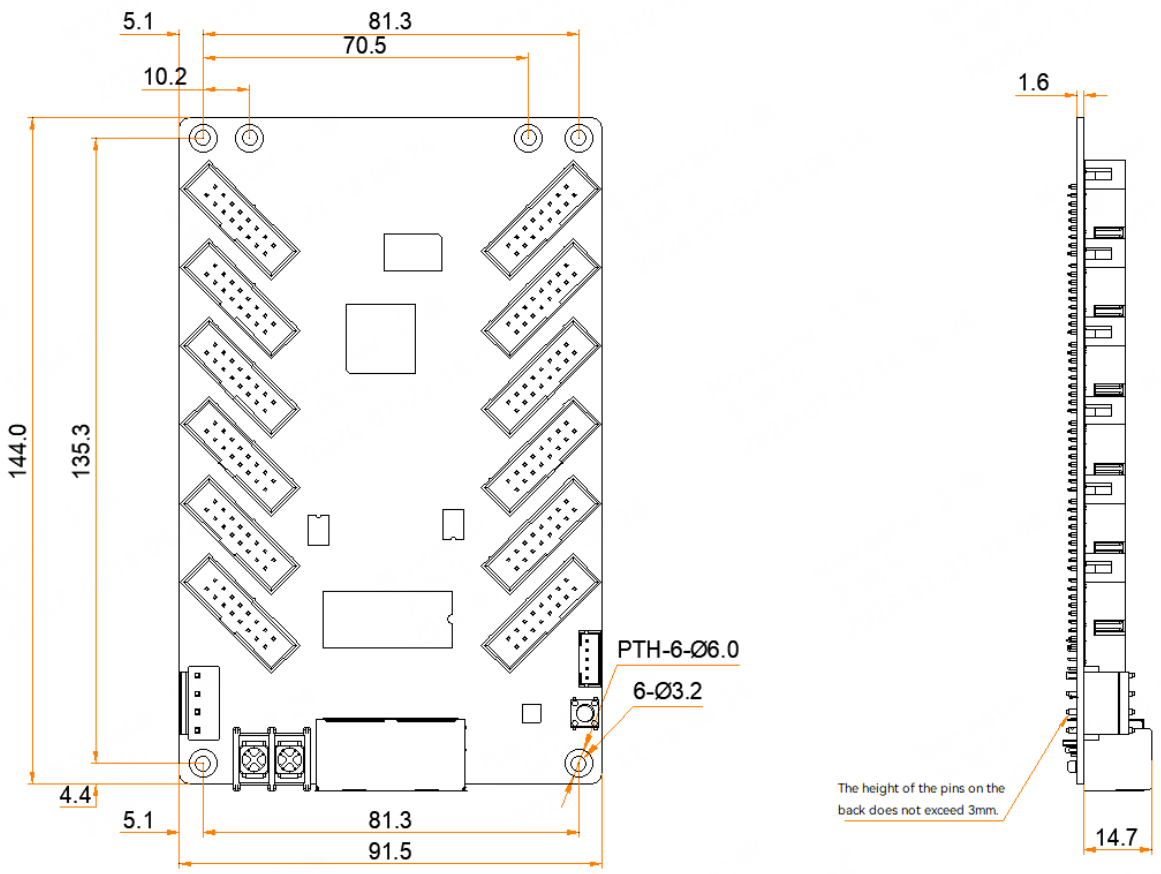
Name	Description
Power Connector	Connect to the input power. Either of the connectors can be chosen.
Gigabit Ethernet Ports	Connect to the sending card, and cascade other receiving cards. Each connector can be used as input or output.
Self-Test Button	Set the test pattern. After the Ethernet cable is disconnected, press the button twice, and the test pattern will be displayed on the screen. Press the button again to switch the pattern.
5-Pin LCD Connector	Connect to the LCD.

Indicators

Indicators	Color	Status	Description
Running indicator	Green	Flashing once every 1s	The receiving card is functioning normally. Ethernet cable connection is normal, and video source input is available.
		Flashing once every 3s	Ethernet cable connection is abnormal.
		Flashing 3 times every 0.5s	Ethernet cable connection is normal, but video source input is unavailable.
		Flashing once every 0.2s	The receiving card failed to load the program in the application area and is now using the backup program.
		Flashing 8 times every 0.5s	A redundancy switchover occurred on the Ethernet port and the loop backup has taken effect.
Power indicator	Red	Always on	The power input is normal.

Dimensions

The board thickness is not greater than 2.0 mm, and the total thickness (board thickness + thickness of components on the top and bottom sides) is not greater than 20.0 mm.

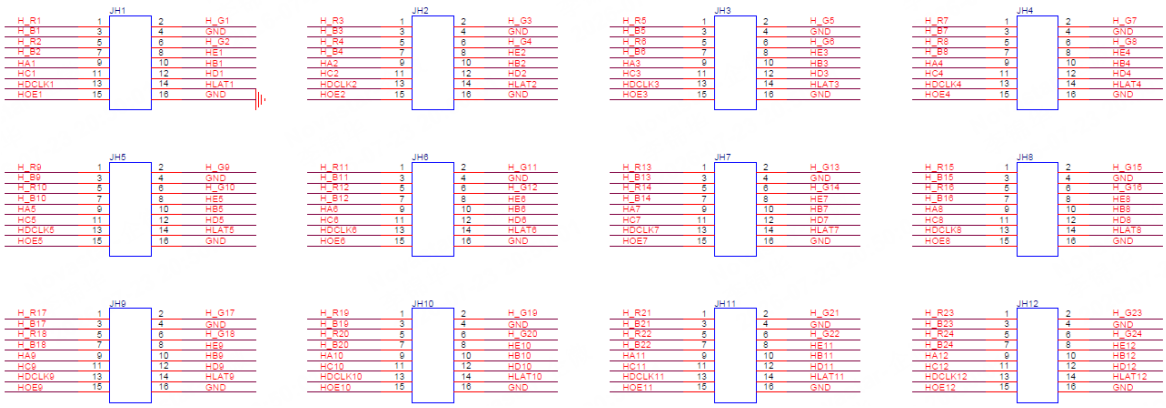


Tolerance: ±0.3 Unit: mm

Note

For molding or installation cutouts, please contact NovaStar for a higher-precision structural drawing.

Pins



Pin Definitions (Take JH1 as an example)					
/	H_R1	1	2	H_G1	/
/	H_B1	3	4	GND	Ground
/	H_R2	5	6	H_G2	/
/	H_B2	7	8	HE1	Row decoding signal
Row decoding signal	HA1	9	10	HB1	Row decoding signal
Row decoding signal	HC1	11	12	HD1	Row decoding signal
Shift clock	HDCLK1	13	14	HLAT1	Latch signal
Display enable signal	HOE1	15	16	GND	Ground

Specifications

Maximum Resolution	When working with 8bit video sources, the maximum load capacity per card is: • 512×512@60Hz (PWM driver IC) • 512×384@60Hz (common driver IC)	
Electrical Parameters	Input voltage	DC 3.8 V to 5.5 V
	Rated current	0.4A@4.2 V
	Rated power consumption	1.68 W
Operating Environment	Temperature	−20°C to +70°C
	Humidity	10% RH to 90% RH, non-condensing
Storage Environment	Temperature	−40°C to +85°C
	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Size	91.5 mm × 144.0 mm × 19.3 mm
	Net weight	93.5 g Note: It is the weight of a single receiving card only.
Packing Information	Packing specifications	Each receiving card is packaged in a blister pack. Each packing box contains 100 receiving cards.
	Packing box dimensions	630.0 mm × 475.0 mm × 195.0 mm

Actual power consumption may vary depending on product settings, usage, environmental conditions, and other factors.

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