# MRV416-N

Receiving Card



# Specifications

# Change History

| Document Version | Release Date | Description |
|---|---|---|
| V1.0.0 | 2024-09-19 | First release |

# Introduction

The MRV416-N is a general receiving card developed by NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar). For PWM driver ICs, a single MRV416-N supports 8-bit video sources and resolutions up to 512×512@60Hz. For common driver ICs, a single MRV416-N supports 8-bit video sources and resolutions up to 512×384@60Hz.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 MRV416-N can significantly improve the display effect and user experience.

The MRV416-N uses 16 standard HUB75E connectors for communication. It supports up to 32 groups of parallel RGB data and is suitable for various on-site setups.

# Certifications

None

**If the product does not have the relevant certifications required by the countries or regions where it is to be sold, please contact NovaStar to confirm or address the problem. Otherwise, the customer shall be responsible for the legal risks caused or NovaStar has the right to claim 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 high-precision 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 of cabinets or modules to minimize display discrepancies caused by variations in production batches.

- Low Latency

  Low Latency can be enabled or disabled as required, default is disabled. When enabled, the latency of video source on 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°).

## Improvements to Maintainability

- Mapping 1.1

  The cabinets can display the controller number, receiving card number, and Ethernet port information, allowing users to easily obtain the locations and connection topology of receiving cards.

- 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 can be customized.

- Temperature and Voltage Monitoring

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

- Cabinet LCD

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

- Bit Error Detection

  Real-time monitoring of the communication of the Ethernet port on the receiving card which helps users troubleshoot network communication problems.

- 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.

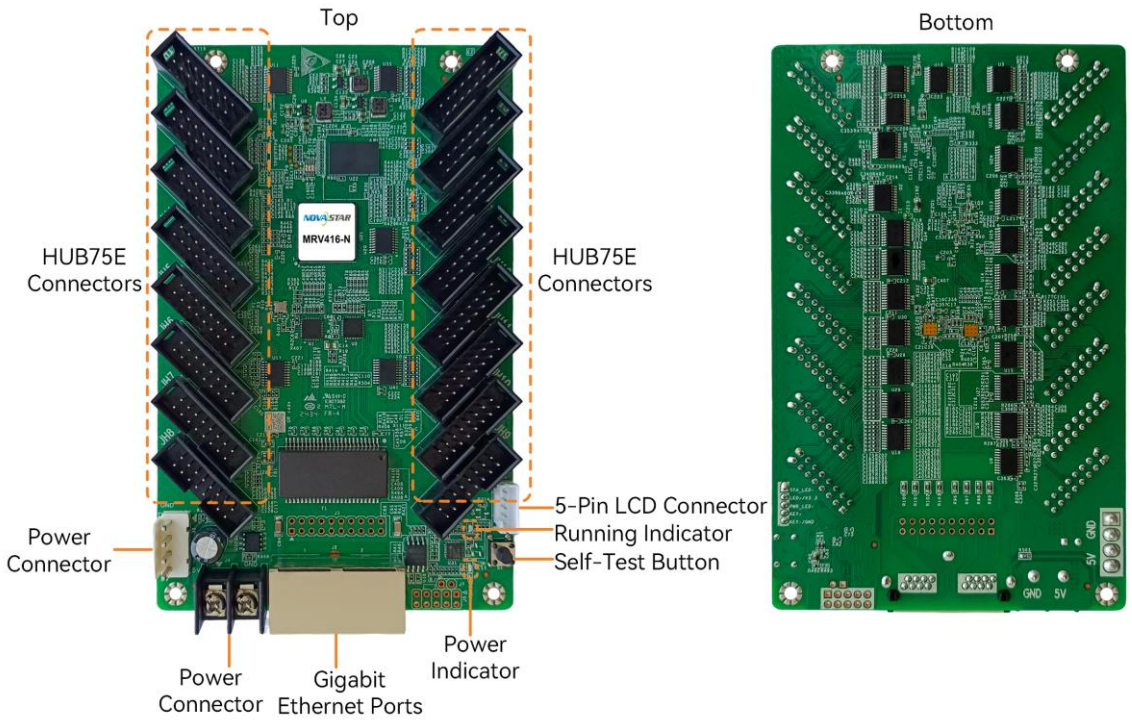
- Dual Backup of Configuration Parameters

  The receiving card configuration parameters are stored in 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 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




All product pictures shown in this document are for illustration purpose only. Actual product may vary.

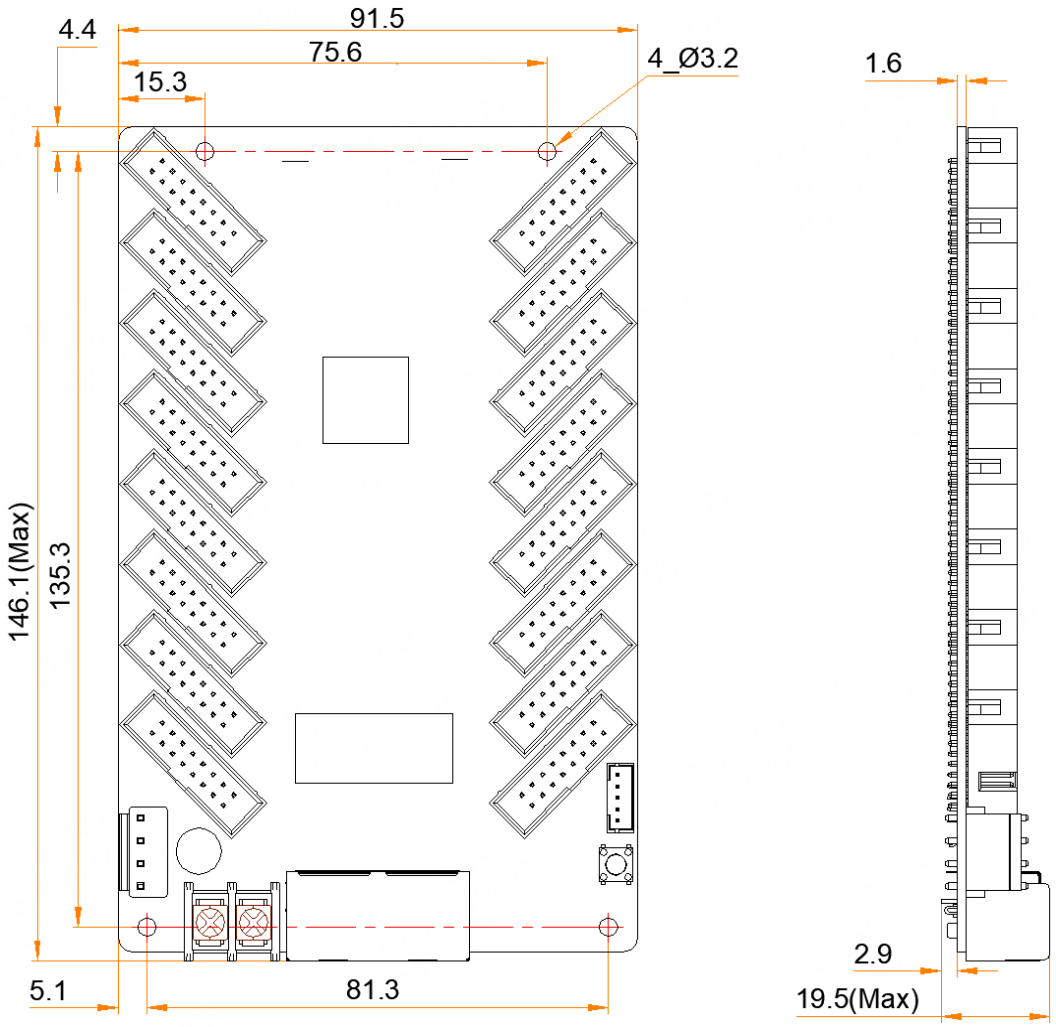
| Name | Description |
|---|---|
| HUB75E Connectors | Connect to the module. |
| Power Connector | Connect to the input power. Either of the connectors can be chosen. |
| Gigabit Ethernet Ports | Connect to the sending card, and cascade other receiving cards. Each connector can be used as input or output. |
| Self-Test Button | Set the test pattern.<br>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. |

# Indicator

| 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 19.5 mm.

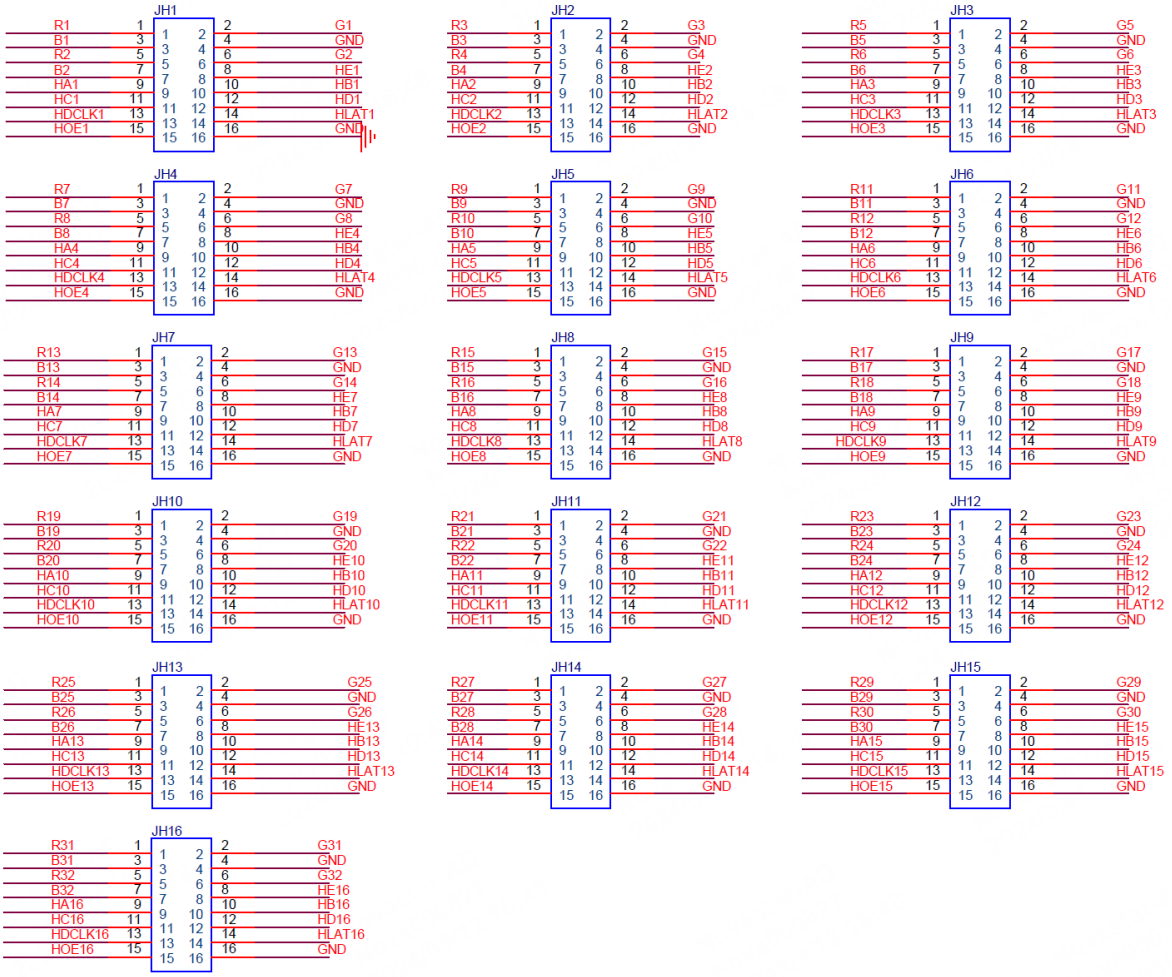



Tolerance: ±0.3 Unit: mm

Note

To make molds or trepan mounting holes, please contact NovaStar for a higher-precision structural drawing.

# Pins




| Pin Definitions (JH1 as an example) | | | | | |
|---|---|---|---|---|---|
| / | R1 | 1 | 2 | G1 | / |
| / | B1 | 3 | 4 | GND | Ground |
| / | R2 | 5 | 6 | G2 | / |
| / | B2 | 7 | 8 | HE1 | Line decoding signal |
| Line decoding signal | HA1 | 9 | 10 | HB1 | |
| | HC1 | 11 | 12 | HD1 | |
| Shift clock | HDCLK1 | 13 | 14 | HLAT1 | Latch signal. |
| Display enable signal | HOE1 | 15 | 16 | GND | Ground |

# Specifications

| | | |
|---|---|---|
| Maximum Resolution | 512×512@60Hz (PWM driver IC, 8-bit video source)<br>512×384@60Hz (common driver IC, 8-bit video source) | |
| Electrical Parameters | Input voltage | DC 3.8 V to 5.5 V |
| | Rated current | 0.5 A |
| | Rated power consumption | 2.5 W |
| Operating Environment | Temperature | –20°C to +70°C |
| | Humidity | 10% RH to 90% RH, non-condensing |
| Storage Environment | Temperature | –25°C to +125°C |
| | Humidity | 0% RH to 95% RH, non-condensing |
| Physical Specifications | Dimensions | 146.1 mm × 91.5 mm × 19.5 mm |
| | Net weight | 104.6 g<br>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 | 625.0 mm × 180.0 mm × 470.0 mm |

The amount of current and power consumption may vary depending on various factors such as product settings, usage, and environment.

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