MRV532

Receiving Card

Specifications

Change History

Document Version	Release Date	Description
V1.2.0	2025-05-20	• Added free image rotation, smart module, calibration coefficient management, upload calibration coefficients, and cabinet LCD to product features. • Updated the load capacity information. • Updated the appearance diagram. • Removed notes for LCD-related features.
V1.1.2	2025-03-20	• Updated the load capacity information. • Updated the dimensions diagram. • Updated the storage environment temperature range. • Updated the packing Information.
V1.1.1	2024-10-22	• Added the certification information. • Added support for multi-batch adjustment. • Added a note for LCD-related features. • Updated the load capacity information.
V1.1.0	2024-09-15	• Added features such as color management, 18bit+, HDR, and individual gamma adjustment for RGB. • Updated the load capacity information. • Deleted seam brightness correction.
V1.0.2	2024-05-23	• Added descriptions for line decoding signal. • Updated the load capacity information.

Introduction

The MRV532 is a receiving card developed by Xi'an NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar). Supporting various functions such as Color Management, 18bit+, HDR, Pixel Level Brightness and Chroma Calibration, Quick Adjustment of Dark or Bright Lines, Multi-batch Adjustment, Low Latency, 3D, Individual Gamma Adjustment for RGB, 90° Image Rotation, and Free Image Rotation, the MRV532 can significantly improve the display effect and user experience. Additionally, the product supports flash management for the module, allowing for the storage and readback of calibration coefficients and module IDs as needed.

The MRV532 uses 10 standard HUB320F connectors to ensure highly stable communication, supporting up to 40 groups of RGB real pixel data, 40 groups of 3-LED dynamic sub-pixel data, or 30 groups of 4-LED dynamic sub-pixel data.

- For PWM driver ICs, the maximum load capacity per card is:
  - 512×512@60Hz (For 8bit video sources)
  - 512×256@60Hz (For 10bit and 12bit video sources)
- For common driver ICs, the maximum load capacity per card is:
  - 512×384@60Hz (For 8bit video sources)
  - 256×256@60Hz (For 10bit and 12bit video sources)

Certifications

RoHS, EMC Class A.

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.

- HDR
  - Support HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards.
  - Support HLG.
- 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 of cabinets or modules to minimize display discrepancies caused by variations in production batches.

- Low Latency

  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°).

- Free Image Rotation

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

Improvements to Maintainability

- Smart Module (dedicated firmware required)

  Work with the smart module to support module ID management, storage of calibration coefficients and module parameters, monitoring of module temperature, voltage and flat cable communication status, and LED error detection

- Calibration Coefficient Management

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

- Automatic Module Calibration

  After a new module with flash memory is installed to replace the old one, the calibration coefficients stored in the flash memory can be automatically uploaded to the receiving card when it is powered on, which ensures unchanged uniform display brightness and chroma.

- Module Auto Light-up (dedicated firmware required)

  After a new module with flash memory is installed to replace the old one, the configuration file stored in the memory can be automatically uploaded to the receiving card when it is powered on. The ensures the module can be lighted up without issue.

- Uploading Calibration Coefficients

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

- Module Flash Management

  For modules with flash memory, the information stored can be managed, allowing for the storage and readback of calibration coefficients and module IDs.

- One-click to Apply Calibration Coefficients in Module Flash

  For modules with flash memory, when the Ethernet cable is disconnected, users can hold down the self-test button on the cabinet to upload the calibration coefficients in the memory of the module to the receiving card.

- 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

  Real-time monitoring of the temperature and voltage of the receiving card, without the need for other 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

- Dual NCP Backup

  The NCP file is stored in the application area and factory area of the receiving card at the same time. Typically, the NCP file in the application area is used. However, during a factory reset, the NCP file can be retrieved from the factory area.

- 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.

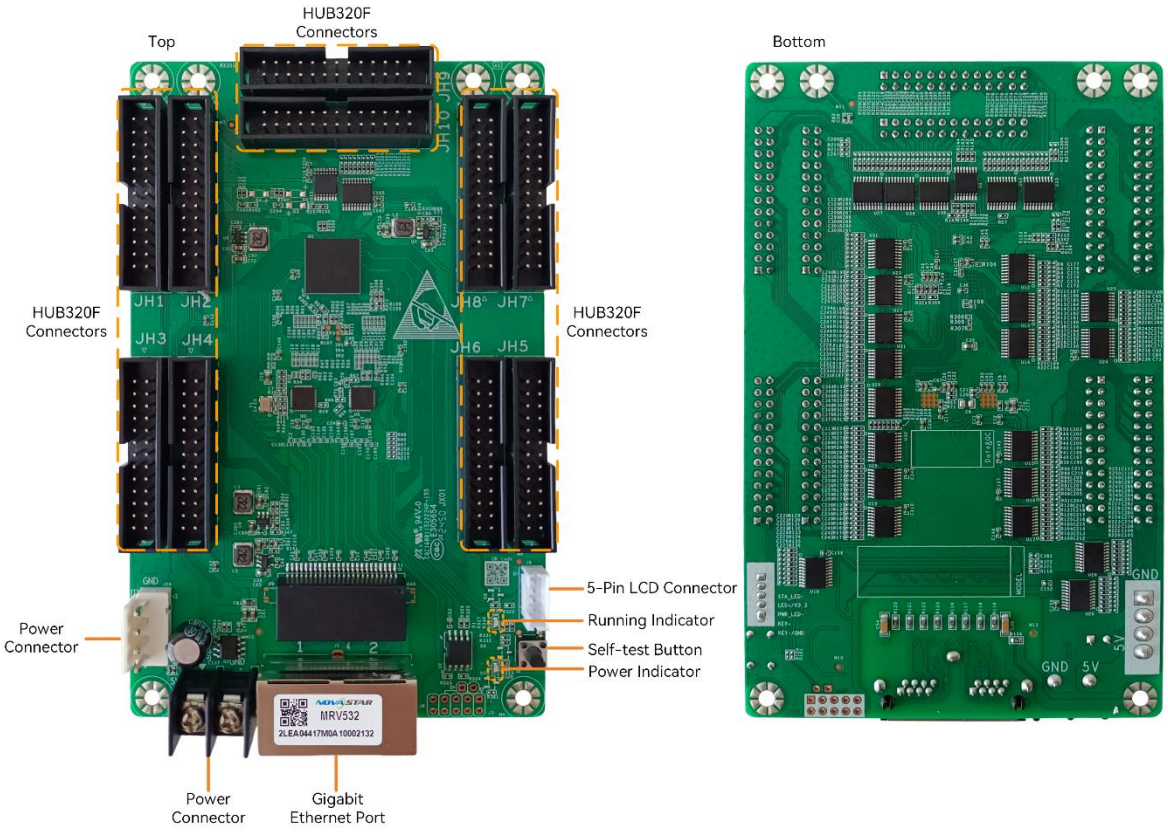
- Dual Backup of Configuration Parameters

  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.

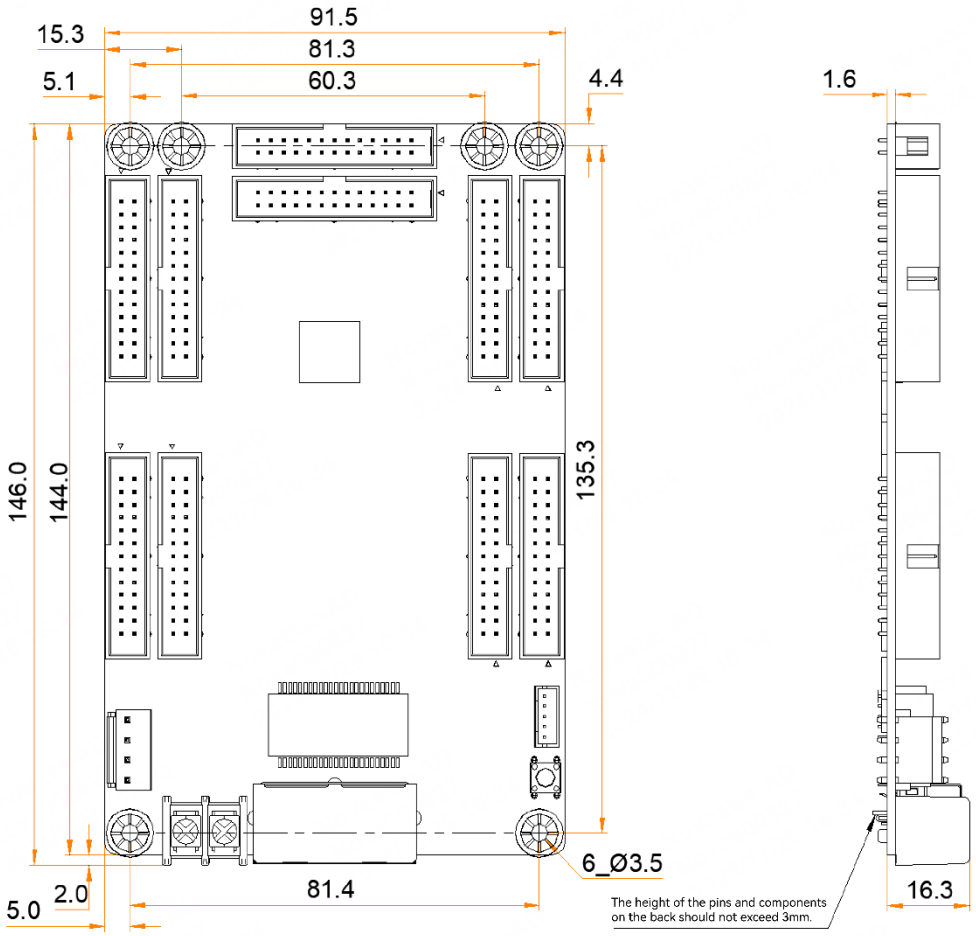
Name	Description
HUB320F Connectors	Connect to the module.
Power Connector	Connect to the input power. Either of the connectors can be chosen.
Gigabit Ethernet Ports	Connect to the sending card, and cascade other receiving cards. Each connector can be used as input or output.
Self-Test Button	Set the test pattern. 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 20.0 mm.



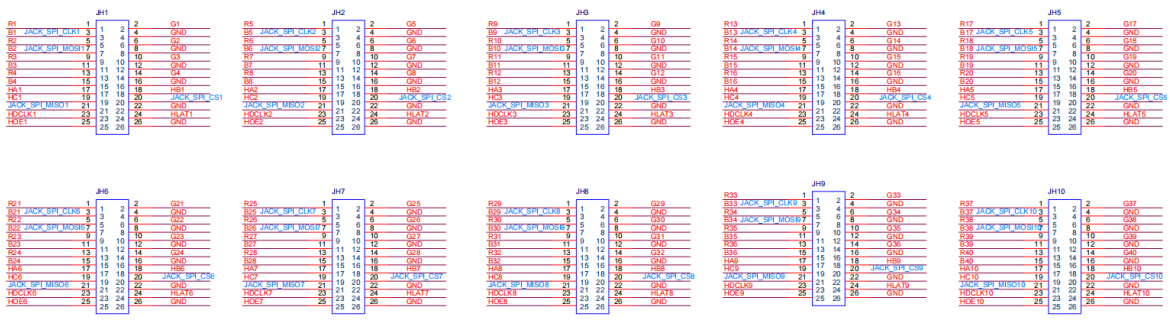
Tolerance: ±0.3 Unit: mm

Note

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

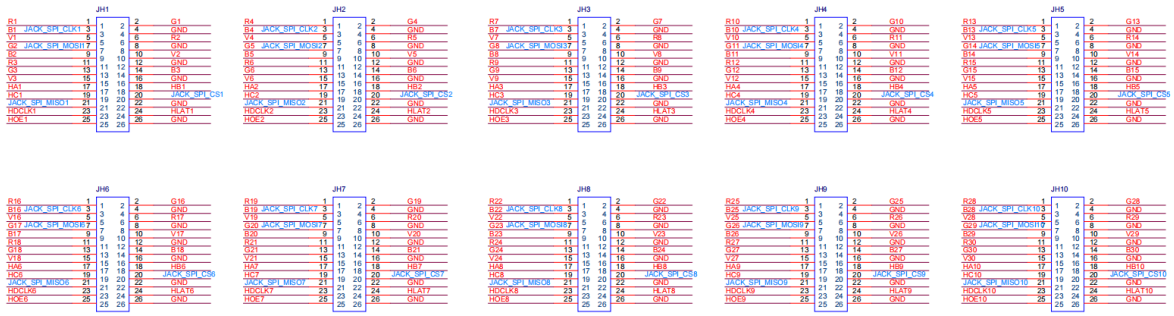
Pins

Real Pixel RGB Data Pins/3-LED Sub-pixel Data Pins



Pin Definitions (JH1 as an example)					
/	R1	1	2	G1	/
B1/Clock signal of serial pin	B1/JACK_SPI_CLK1	3	4	GND	/
/	R2	5	6	G2	/
B2/Module flash data storage input	B2/JACK_SPI_MOSI1	7	8	GND	/
/	R3	9	10	G3	/
/	B3	11	12	GND	/
/	R4	13	14	G4	/
/	B4	15	16	GND	/
Line decoding signal	HA1	17	18	HB1	Line decoding signal
Line decoding signal	HC1	19	20	JACK_SPI_CS1	CS signal of serial pin
Module flash data storage output	JACK_SPI_MISO1	21	22	GND	/
Shift clock	HDCLK1	23	24	HLAT1	Latch signal
Display enable signal	HOE1	25	26	GND	/

4-LED Sub-pixel Data Pins



Pin Definitions (JH1 as an example)					
/	R1	1	2	G1	/
B1/Clock signal of serial pin	B1/JACK_SPI_CLK1	3	4	GND	/
/	V1	5	6	R2	/

Pin Definitions (JH1 as an example)					
G2/Module flash data storage input	G2/JACK_SPI_MOSI1	7	8	GND	/
/	B2	9	10	V2	/
/	R3	11	12	GND	/
/	G3	13	14	B3	/
/	V3	15	16	GND	/
Line decoding signal	HA1	17	18	HB1	Line decoding signal
Line decoding signal	HC1	19	20	JACK_SPI_CS1	CS signal of serial pin
Module flash data storage output	JACK_SPI_MISO1	21	22	GND	/
Shift clock	HDCLK1	23	24	HLAT1	Latch signal
Display enable signal	HOE1	25	26	GND	/

Note

Line decoding only supports signals A, B, and C, and does not support signals D and E.

Specifications

Maximum Resolution	• For PWM driver ICs, the maximum load capacity per card is: – 512×512@60Hz (For 8bit video sources) – 512×256@60Hz (For 10bit and 12bit video sources) • For common driver ICs, the maximum load capacity per card is: – 512×384@60Hz (For 8bit video sources) – 256×256@60Hz (For 10bit and 12bit video sources)	
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	Temperature	–40°C to +85°C

Environment	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	146.0 mm × 91.5 mm × 19.3 mm
	Net weight	99.5 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	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.

Copyright

Statement

Thank you for choosing NovaStar's product. This document is intended to help you understand and use the product. For accuracy and reliability, NovaStar may make improvements and/or changes to this document at any time and without notice. If you experience any problems in use or have any suggestions, please contact us via the contact information given in this document. We will do our best to solve any issues, as well as evaluate and implement any suggestions.

Official website
www.novastar.tech

Technical support
support@novastar.tech