

MRV416

Receiving Card



Specifications

Change History

Document Version	Release Date	Description
V1.1.0	2024-10-25	<ul style="list-style-type: none"> Added color management, 18bit+, 90° image rotation, and multi-batch adjustment to product features. Updated brightness calibration to pixel level brightness and chroma calibration. Updated the description for the Mapping feature. Updated the dimensions diagram.
V1.0.5	2023-12-30	Updated product feature descriptions.
V1.0.4	2022-12-27	<ul style="list-style-type: none"> Updated the description of the maximum resolution. Updated the dimensions diagram. Removed dual backup of configuration parameters from product features.
V1.0.3	2022-08-31	<ul style="list-style-type: none"> Added the table of appearance description. Added a description for the dimensions diagram. Updated the appearance diagram. Updated the input voltage. Updated the packing Information.
V1.0.2	2021-12-03	<ul style="list-style-type: none"> Updated the certification related descriptions. Updated product feature descriptions.

Introduction

The MRV416 is a general receiving card developed by NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar). For PWM driver ICs, a single MRV416 supports resolutions up to 512×384@60Hz. For common driver ICs, a single MRV416 supports resolutions up to 384×384@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, 3D, Individual Gamma Adjustment for RGB, and 90° Image Rotation, the MRV416 can significantly improve the display effect and user experience.

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

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.

- 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.

- 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

- Quick Uploading of Calibration Coefficients

Upload the calibration coefficients quickly to the receiving cards to improve efficiency.

- 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.

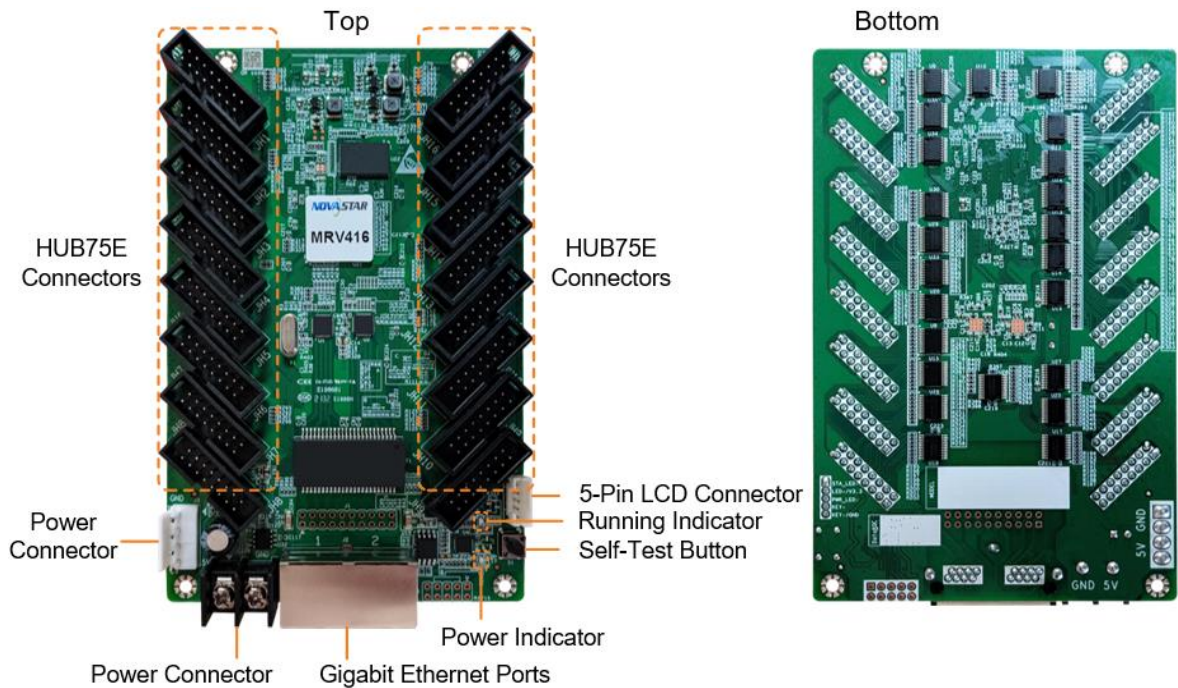
- Configuration Parameter Readback

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 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	Connect to the sending card, and cascade other receiving cards.

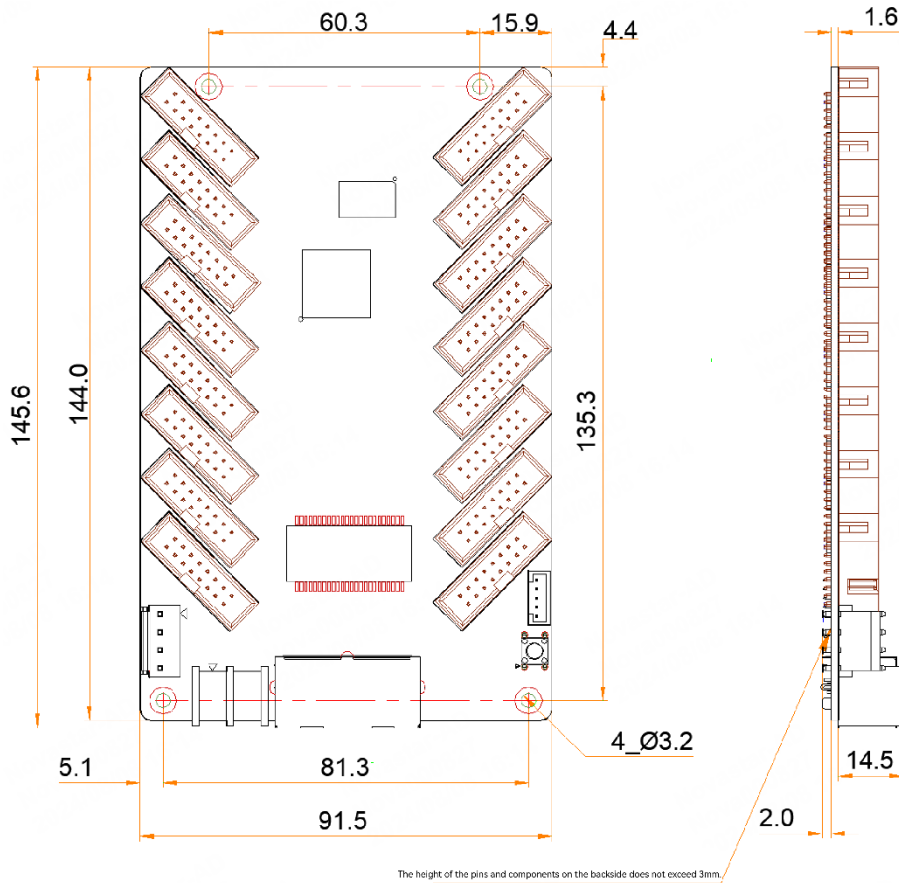
Name	Description
Ports	Each connector can be used as input or output.
Self-Test Button	Set the test pattern. After the Ethernet cable is disconnected, press the button twice, and the test pattern will be displayed on the screen. Press the button again to switch the pattern.
5-Pin LCD Connector	Connect 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 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

JH1					
R1	1	2	G1		
B1	3	4	GND		
R2	5	6	G2		
B2	7	8	HE1		
HA1	9	10	HB1		
HC1	11	12	HD1		
HDCLK1	13	14	HLAT1		
HOE1	15	16	GND		

JH2					
R3	1	2	G3		
B3	3	4	GND		
R4	5	6	G4		
B4	7	8	HE15		
HA15	9	10	HB15		
HC15	11	12	HD15		
HDCLK2	13	14	HLAT2		
HOE2	15	16	GND		

JH3					
R5	1	2	G5		
B5	3	4	GND		
R6	5	6	G6		
B6	7	8	HE2		
HA2	9	10	HB2		
HC2	11	12	HD2		
HDCLK3	13	14	HLAT3		
HOE3	15	16	GND		

JH4					
R7	1	2	G7		
B7	3	4	GND		
R8	5	6	G8		
B8	7	8	HE16		
HA16	9	10	HB16		
HC16	11	12	HD16		
HDCLK4	13	14	HLAT4		
HOE4	15	16	GND		

JH5					
R9	1	2	G9		
B9	3	4	GND		
R10	5	6	G10		
B10	7	8	HE3		
HA3	9	10	HB3		
HC3	11	12	HD3		
HDCLK5	13	14	HLAT5		
HOE5	15	16	GND		

JH6					
R11	1	2	G11		
B11	3	4	GND		
R12	5	6	G12		
B12	7	8	HE11		
HA11	9	10	HB11		
HC11	11	12	HD11		
HDCLK6	13	14	HLAT6		
HOE6	15	16	GND		

JH7					
R13	1	2	G13		
B13	3	4	GND		
R14	5	6	G14		
B14	7	8	HE4		
HA4	9	10	HB4		
HC4	11	12	HD4		
HDCLK7	13	14	HLAT7		
HOE7	15	16	GND		

JH8					
R15	1	2	G15		
B15	3	4	GND		
R16	5	6	G16		
B16	7	8	HE12		
HA12	9	10	HB12		
HC12	11	12	HD12		
HDCLK8	13	14	HLAT8		
HOE8	15	16	GND		

JH9					
R17	1	2	G17		
B17	3	4	GND		
R18	5	6	G18		
B18	7	8	HE5		
HA5	9	10	HB5		
HC5	11	12	HD5		
HDCLK9	13	14	HLAT9		
HOE9	15	16	GND		

JH10					
R19	1	2	G19		
B19	3	4	GND		
R20	5	6	G20		
B20	7	8	HE13		
HA13	9	10	HB13		
HC13	11	12	HD13		
HDCLK10	13	14	HLAT10		
HOE10	15	16	GND		

JH11					
R21	1	2	G21		
B21	3	4	GND		
R22	5	6	G22		
B22	7	8	HE6		
HA6	9	10	HB6		
HC6	11	12	HD6		
HDCLK11	13	14	HLAT11		
HOE11	15	16	GND		

JH12					
R23	1	2	G23		
B23	3	4	GND		
R24	5	6	G24		
B24	7	8	HE14		
HA14	9	10	HB14		
HC14	11	12	HD14		
HDCLK12	13	14	HLAT12		
HOE12	15	16	GND		

JH13					
R25	1	2	G25		
B25	3	4	GND		
R26	5	6	G26		
B26	7	8	HE7		
HA7	9	10	HB7		
HC7	11	12	HD7		
HDCLK13	13	14	HLAT13		
HOE13	15	16	GND		

JH14					
R27	1	2	G27		
B27	3	4	GND		
R28	5	6	G28		
B28	7	8	HE9		
HA9	9	10	HB9		
HC9	11	12	HD9		
HDCLK14	13	14	HLAT14		
HOE14	15	16	GND		

JH15					
R29	1	2	G29		
B29	3	4	GND		
R30	5	6	G30		
B30	7	8	HE8		
HA8	9	10	HB8		
HC8	11	12	HD8		
HDCLK15	13	14	HLAT15		
HOE15	15	16	GND		

JH16					
R31	1	2	G31		
B31	3	4	GND		
R32	5	6	G32		
B32	7	8	HE10		
HA10	9	10	HB10		
HC10	11	12	HD10		
HDCLK16	13	14	HLAT16		
HOE16	15	16	GND		

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.

Pin Definitions (JH1 as an example)					
Display enable signal	HOE1	15	16	GND	Ground

Specifications

Maximum Resolution	512×384@60Hz (PWM driver IC)	
	384×384@60Hz (common driver IC)	
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	145.6 mm × 91.5 mm × 19.1 mm
	Net weight	101.9 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	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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