NV3210

Receiving Card

Specifications

Change History

Document Version	Release Date	Description
V1.1.1	2024-10-22	• Added certification information. • Added multi-batch adjustment. • Added a note for LCD-related features. • Updated descriptions for load capacity.
V1.1.0	2024-09-15	• Added features such as color management, 18bit+, HDR, and individual gamma adjustment for RGB. • Updated descriptions for load capacity. • Deleted seam brightness correction.
V1.0.2	2024-05-23	• Added descriptions for line decoding signal. • Updated descriptions for load capacity.
V1.0.1	2024-05-15	• Added the software copyright. • Updated descriptions for load capacity. • Updated product feature descriptions. • Updated the HUB port name.

Introduction

The NV3210 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, and 90° Image Rotation, the NV3210 can significantly improve the display effect and user experience.

The NV3210 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 sub-pixel data, or 30 groups of 4-LED sub-pixel data.

- For PWM driver ICs, the maximum load capacity per card is:
  - When used with M3 controllers:

    512×512@60Hz (For 8bit video sources)

    512×384@60Hz (For 10bit and 12bit video sources)

  - When used with COEX controllers:

    512×512@60Hz (For 8bit and 10bit video sources)

    512×384@60Hz (For 12bit video sources)

- For common driver ICs, the maximum load capacity per card is:
  - When used with M3 controllers:

    512×384@60Hz (For 8bit video sources)

    256×384@60Hz (For 10bit and 12bit video sources)
  - When used with COEX controllers:

    512×384@60Hz (For 8bit and 10bit video sources)

    256×384@60Hz (For 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 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

  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

- 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.

- Module Flash Management

  For modules with flash memory, the information stored in the memory can be managed. The calibration coefficients and module ID can be stored and read back.

- 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.

- 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.

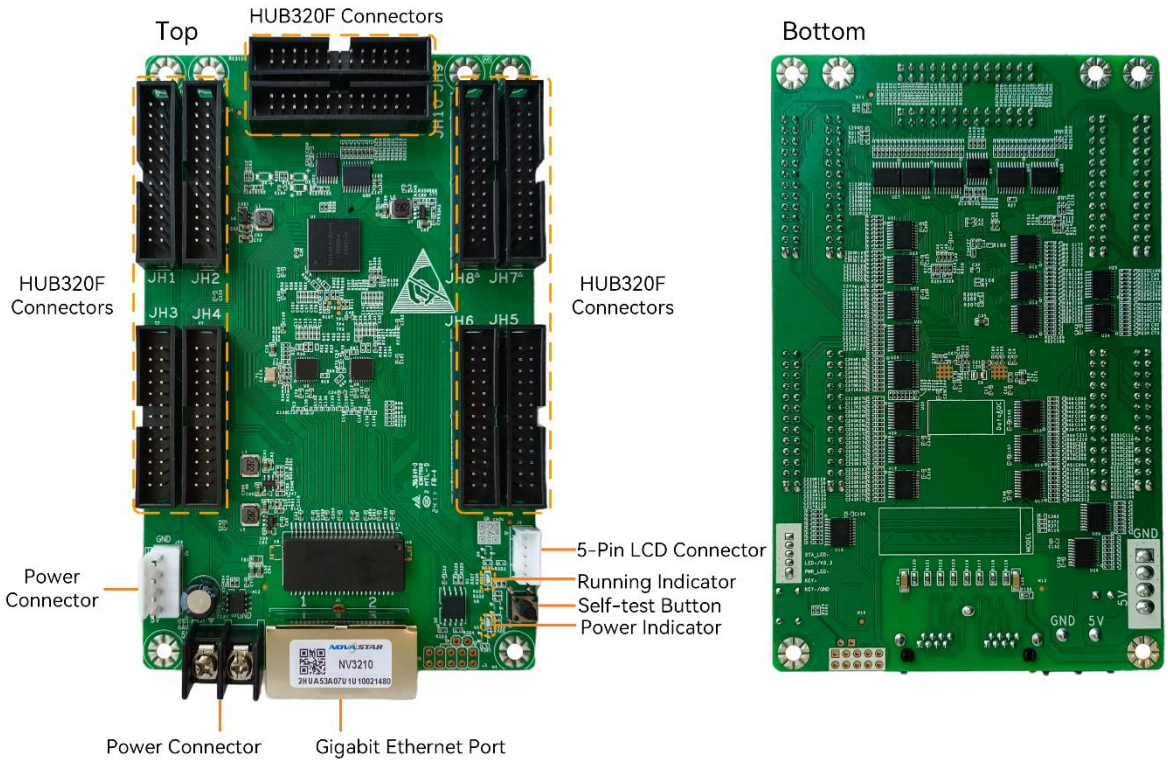
- Dual Backup of Configuration Parameters

  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.

Name	Description
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.

Note

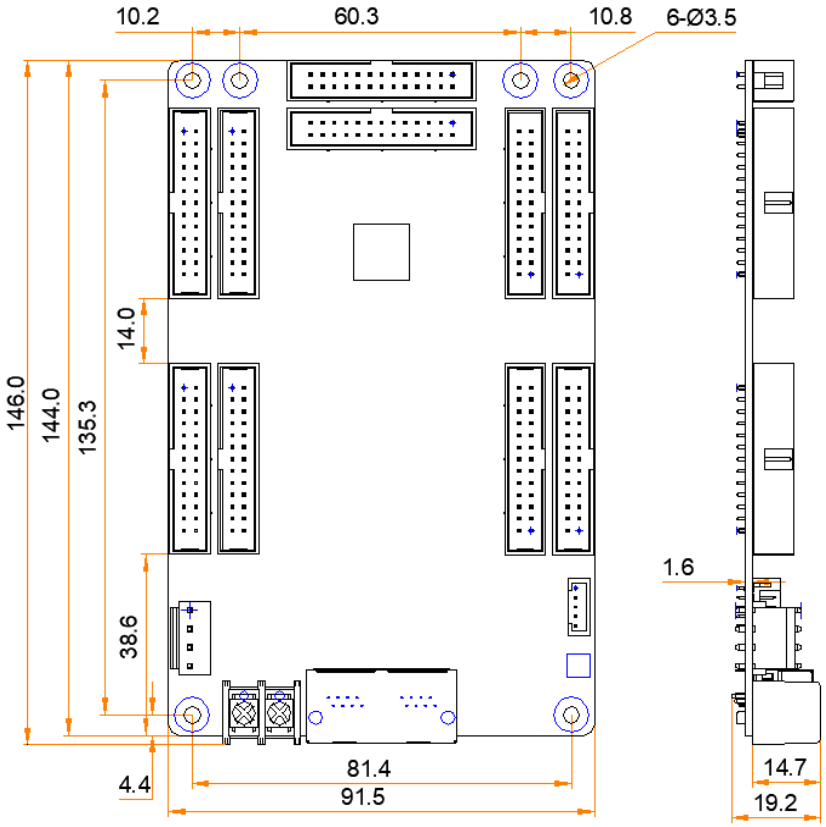
The LCD-related features are supported only by specialized firmware.

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.



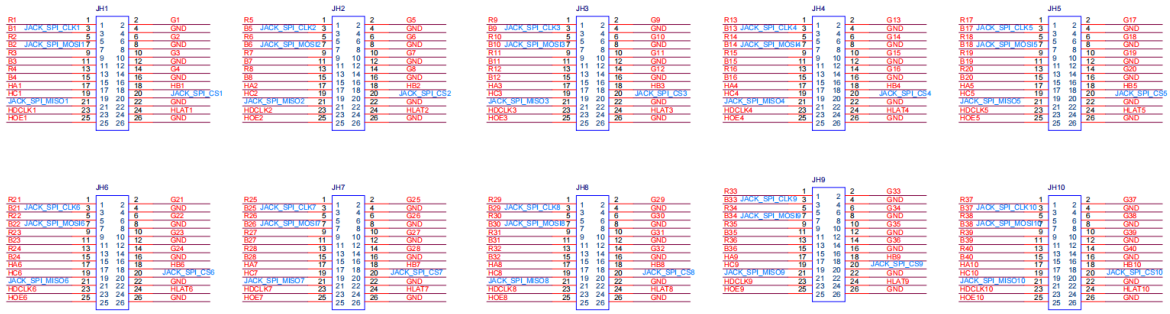
Tolerance: ±0.3 Unit: mm

Note

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

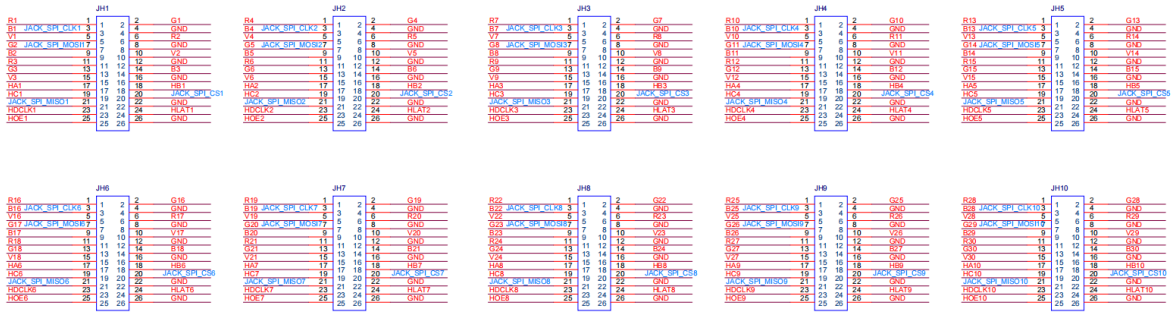
Pins

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	/
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 A, B, and C signals, and does not support D and E signals.

Specifications

Maximum Resolution	• For PWM driver ICs, the maximum load capacity per card is: – When used with M3 controllers: 512×512@60Hz (For 8bit video sources) 512×384@60Hz (For 10bit and 12bit video sources) – When used with COEX controllers: 512×512@60Hz (For 8bit and 10bit video sources) 512×384@60Hz (For 12bit video sources) • For common driver ICs, the maximum load capacity per card is: – When used with M3 controllers: 512×384@60Hz (For 8bit video sources) 256×384@60Hz (For 10bit and 12bit video sources) – When used with COEX controllers: 512×384@60Hz (For 8bit and 10bit video sources) 256×384@60Hz (For 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 Environment	Temperature	–25°C to +125°C
	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	146.0 mm × 91.5 mm × 19.2 mm
	Net weight	99.5 g Note: It is the weight of a single receiving card only.
Packing Information	Packing specifications	An antistatic bag and anti-collision foam are provided for each receiving card. 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

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