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› Waveshare RGB LED Matrix Panel 64x32 User Manual

waveshare RGB-Matrix-P3-64x32

Waveshare RGB LED Matrix Panel 64x32 User Manual

Model: RGB-Matrix-P3-64x32 (Matrix 64 x 32-3 P)

Brand: Waveshare

1. INTRODUCTION

This manual provides detailed instructions for the Waveshare RGB LED Matrix Panel 64x32. This panel features 2048 individual RGB LEDs with a 3mm pitch, offering a full-color display with adjustable brightness. It is designed for compatibility with development boards such as Arduino, Raspberry Pi Pico, and ESP32, enabling the display of text, colorful images, and animations.

The panel's dimensions are 192mm × 96mm, making it suitable for various display applications, including DIY desktop setups or wall-mounted displays.

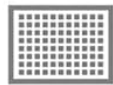
64×32 RGB LED Matrix Panel

2048 Individual RGB LEDs, 3mm Pitch

Supports Raspberry Pi Pico, ESP32, Arduino...



192×96 mm



64×32 pixels



FOV >160°



RGB full-color



2048 LEDs

Features At A Glance

Maybe be on the wall of tall buildings, maybe on corners of unknown streets, you can always see the dazzling neon light, everywhere in the noisy yet energetic city. Sometimes, looking at these shining screens, you may want to make a unique one, and give it to the beautiful night as a gift. Now, this **64×32 RGB LED matrix panel** will be the start to make your wish come true.

- 2048 individual RGB LEDs, full-color display, adjustable brightness
- 64×32 pixels, 3mm pitch, allows displaying text, colorful image, or animation
- 192×96mm dimensions, moderate size, suitable for DIY desktop display or wall mount display
- Onboard two HUB75 header, one for controller data input, one for output, chain support
- Provides open source development resources and tutorials, for use with Raspberry Pi Pico, ESP32, Arduino, and so on

Figure 1: Overview of the RGB LED Matrix Panel 64x32.

2. FEATURES

- 2048 individual RGB LEDs for full-color display.
- Adjustable brightness.
- 64×32 pixel resolution with a 3mm pitch.

- Supports displaying text, colorful images, and animations.
- Dimensions: 192mm × 96mm.
- Chainable design with two onboard HUB75 headers (one for input, one for output) to create larger display panels.
- Compatible with Raspberry Pi Pico, ESP32, Arduino, and similar microcontrollers.
- Provides open-source development resources and tutorials.

3. PACKAGE CONTENTS

Verify that all items are present in your package:

- RGB-Matrix-P3-64x32 LED matrix and accessories (x1)
- 16P wire (~30cm) (x1)
- Dark brown acrylic front panel (x1)
- Power supply terminal adapter (x1)
- Double-sided tape (x1)
- Magnetic bolt (4pcs) (x1)



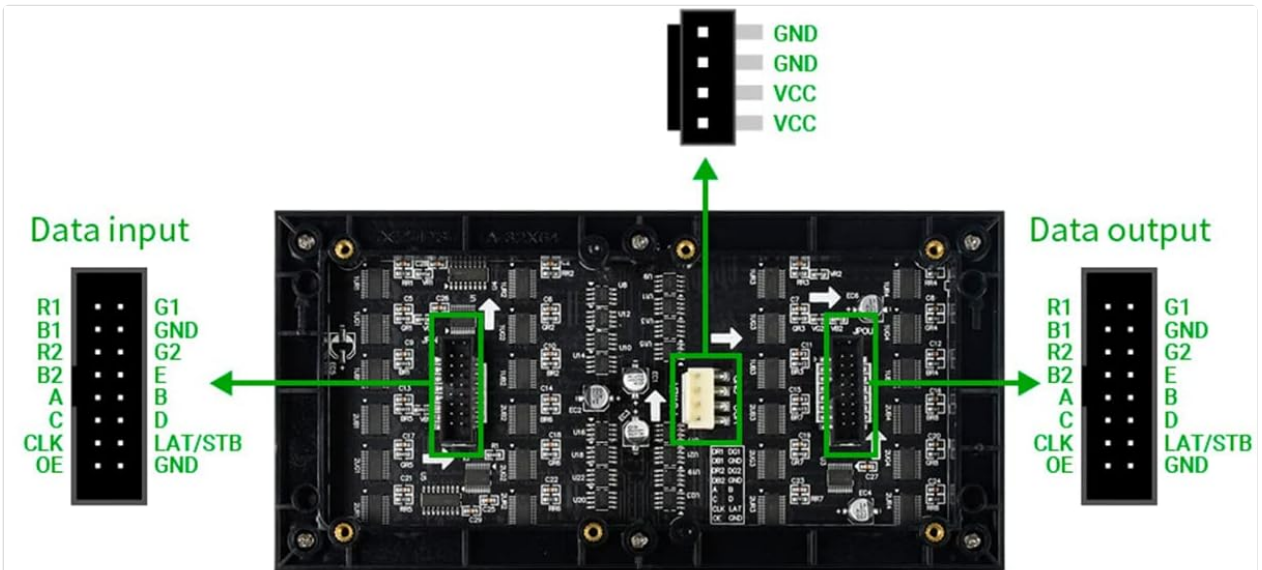
Figure 2: Included components in the package.

4. SETUP

4.1 Physical Installation

1. Attach the magnetic bolts to the back of the LED matrix panel for mounting.

2. Use the double-sided tape or suction cups (if provided separately) to secure the panel to a desired surface.
3. Connect the power supply terminal adapter to the panel's VH4 header input.
4. Connect the 16P wire to the HUB75 input header for data connection to your microcontroller.



PIN	DESCRIPTION	PIN	DESCRIPTION
VCC	5V power input	GND	Ground
R1	R higher bit data	R2	R lower bit data
G1	G higher bit data	G2	G lower bit data
B1	B higher bit data	B2	B lower bit data
A	A line selection	B	B line selection
C	C line selection	D	D line selection
E	E line selection	CLK	clock input
LAT/STB	latch pin	OE	output enable

Figure 3: Pinout and connection details for the LED Matrix Panel.

4.2 Power Connection

The panel requires a 5V / 2.5A power supply connected via the VH4 header input. Ensure the power supply meets these specifications to prevent damage and ensure optimal performance.

4.3 Software Setup

The panel is compatible with Arduino, Raspberry Pi Pico, and ESP32. Refer to the online user manual and open-source development resources for specific libraries, code examples, and detailed instructions on how to program and control the display with your chosen microcontroller.

Online User Manual/Online Resource: [//bit.ly/3VrjhtV](https://bit.ly/3VrjhtV)

5. OPERATING INSTRUCTIONS

5.1 Displaying Content

Once connected to a compatible microcontroller and programmed, the panel can display various content types:

- **Text:** Program the panel to show scrolling text, static messages, or dynamic text updates.
- **Images:** Display colorful images. The 64x32 pixel resolution allows for clear pixel art or simplified graphics.
- **Animations:** Create and display simple animations or GIF-like sequences.

5.2 Adjustable Brightness

The brightness of the LED panel can be adjusted through software control on your microcontroller. Consult the programming guides in the online resources for instructions on how to implement brightness control.

5.3 Chainable Design

Multiple LED matrix panels can be chained together to form a larger display. Connect the HUB75 output of one panel to the HUB75 input of the next. Each panel in the chain requires a standalone 5V/2.5A or above power supply when chained to display.

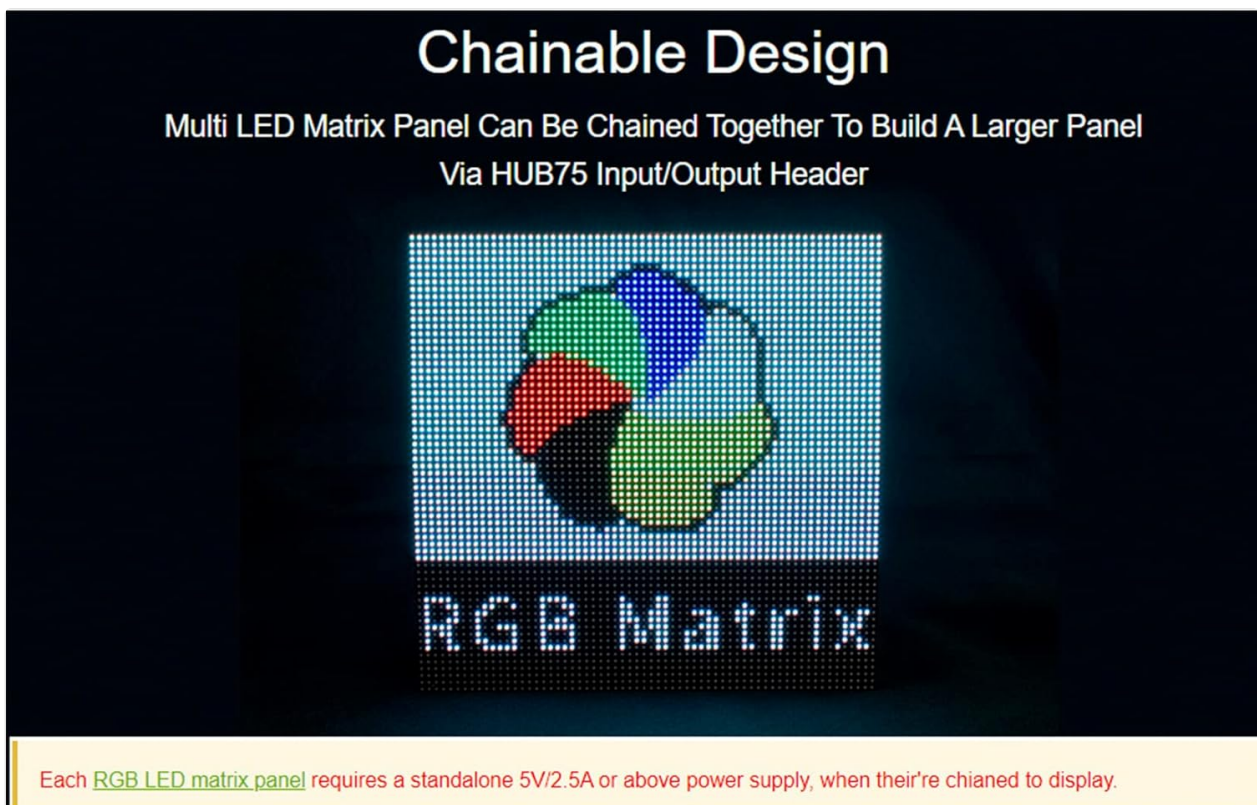


Figure 4: Chainable design for expanding display size.

6. TECHNICAL SPECIFICATIONS

Specification	Value
Dimensions	192mm × 96mm
Pixels	64×32 = 2048 DOTS
Pitch	3mm
Pixel Form	1R1G1B
Viewing Angle	≥160°
Control Type	Synchronization
Driving	1/16 Scan
Header	HUB75
Power Supply	5V / 2.5A (VH4 header input)
Power Consumption	≤12W
Compatible Devices	Arduino, Raspberry Pi Pico, ESP32

Dimensions



Figure 5: Physical dimensions of the LED Matrix Panel.

7. USAGE SCENARIOS

The Waveshare RGB LED Matrix Panel 64x32 is versatile and can be used in various applications:

- DIY desktop displays
- Wall-mounted displays
- Digital signboards
- Environment monitors
- Educational projects

Usage Scenarios

DIY Maker Desktop Or Wall Mount Display, Signboard, Environment Monitor...



Figure 6: Examples of the LED Matrix Panel in use.

8. TROUBLESHOOTING

8.1 Common Problems and Solutions

- **Display not lighting up:** Ensure the 5V/2.5A power supply is correctly connected and functioning. Check all cable connections, especially the HUB75 data cable.
- **Incorrect display or flickering:** Verify that the correct libraries and code are uploaded to your microcontroller. Check the data cable for proper connection and integrity. Ensure the power supply is stable and sufficient.
- **Panel not recognized by microcontroller:** Confirm that the microcontroller's GPIO pins are correctly mapped to the HUB75 header. Reinstall or update necessary drivers and libraries.
- **Issues with chained panels:** Each chained panel requires its own adequate power supply. Ensure data connections between panels are correct (output to input).

For more detailed troubleshooting and specific error codes, refer to the online user manual and community forums for your chosen microcontroller platform.

9. SUPPORT & WARRANTY

For technical support, additional resources, and the latest documentation, please visit the official Waveshare website or the online resource link provided in this manual. Waveshare provides open-source development resources and tutorials to assist users.

Information regarding product warranty, returns, and service can typically be found on the product's purchase page or the manufacturer's official website. Please retain your proof of purchase for warranty claims.

