

Manuals+

[Q & A](#) | [Deep Search](#) | [Upload](#)

manuals.plus /

› [waveshare](#) /

› [Waveshare RGB Full-Color LED Matrix Panel \(Pico-RGB-LED\) Instruction Manual](#)

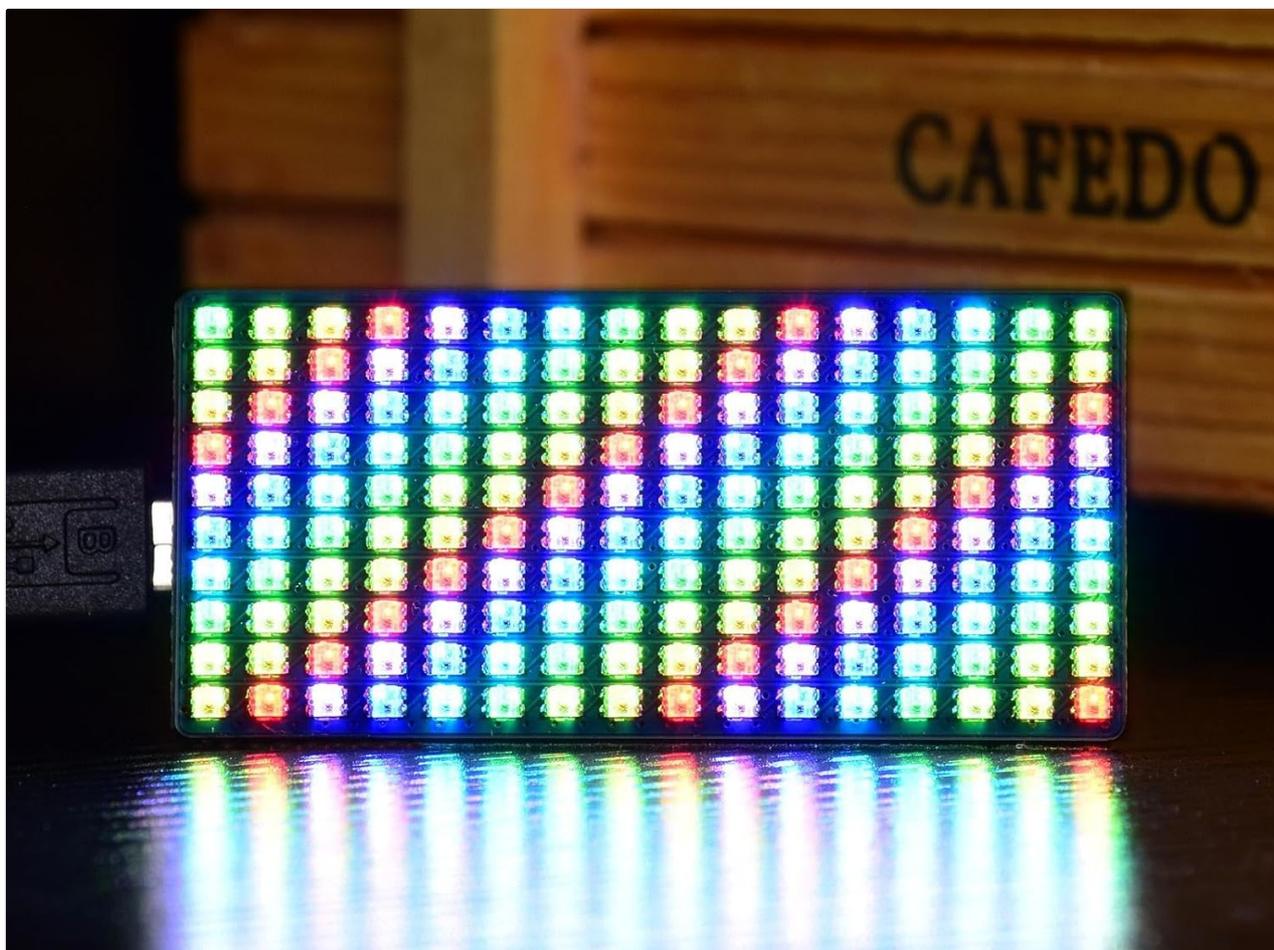
waveshare Pico-RGB-LED

Waveshare RGB Full-Color LED Matrix Panel

Model: Pico-RGB-LED

1. INTRODUCTION

This instruction manual provides detailed information for the Waveshare RGB Full-Color LED Matrix Panel, model Pico-RGB-LED. This panel is designed for use with the Raspberry Pi Pico series, offering a 16x10 grid of RGB LEDs for various display applications. It integrates a quality single-wire cascading constant current driver IC and RGB LED chips, ensuring consistent brightness and reliable performance.



2. SAFETY INFORMATION

Please read and understand the following safety precautions before using the product to prevent damage or injury:

- **Electrostatic Discharge (ESD) Protection:** Electronic components are sensitive to static electricity. Handle the board by its edges and use an anti-static wrist strap or mat when possible.
- **Power Supply:** Ensure the power supply connected to the Raspberry Pi Pico or the LED panel is within the specified voltage range (typically 5V). Incorrect voltage can damage the device.
- **Component Handling:** Avoid touching the LED surfaces directly to prevent damage or smudges.
- **Environmental Conditions:** Operate the device in a dry environment. Avoid exposure to moisture, extreme temperatures, or corrosive substances.

3. PRODUCT OVERVIEW

The Pico-RGB-LED is a compact display solution featuring 160 RGB LEDs arranged in a 16x10 grid. It is designed for direct integration with the Raspberry Pi Pico via its standard header. The panel utilizes 0807 colorful LEDs with an embedded controller IC for reliable performance.

RGB LED Matrix Panel For Pico

16×10 RGB full-color

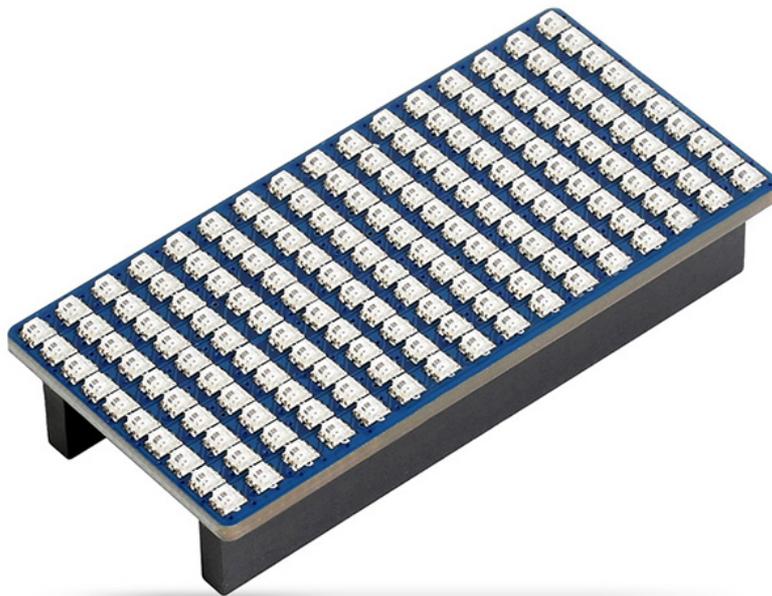


Image 3.1: Top view of the Waveshare RGB LED Matrix Panel, highlighting the 16x10 grid of full-color LEDs.

3.1 Onboard Components

The module features a right-angled 2.54mm pitch male pinheader on the bottom for easy extension and connection. Key pins for data input (DIN) and power (5V, GND) are clearly marked.

Onboard Right-Angled Male Pinheader

For Connecting External Driver, Or Cascading

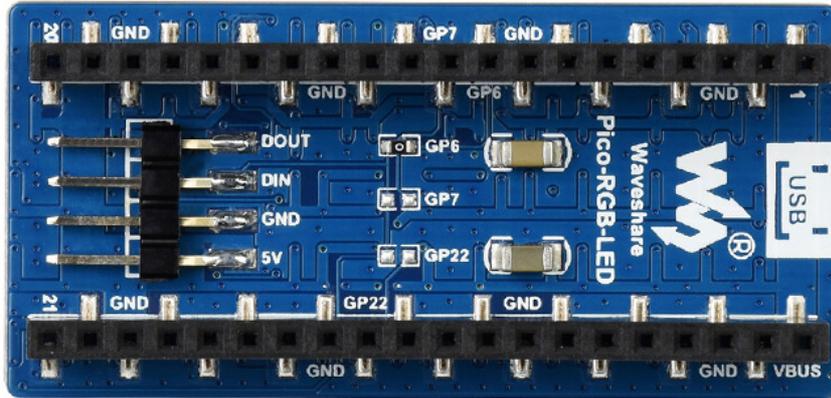


Image 3.2: Bottom view of the LED Matrix Panel, illustrating the right-angled male pinheader for external connections or cascading.

3.2 Pinout Definition

Understanding the pinout is crucial for correct integration with your Raspberry Pi Pico or other microcontrollers. The panel supports multiple IO selections for data input.

Pinout Definition

GP0	1	40	VBUS	Power input
GP1	2	39	VSYS	
GND	3	38	GND	Ground
GP2	4	37	3V3_EN	
GP3	5	36	3V3(OUT)	
GP4	6	35	ADC_VREF	
GP5	7	34	GP28	
GND	8	33	GND	
GP6	9	32	GP27	GP6 DIN Data input (default)
GP7	10	31	GP26	GP7 DIN Data input (alternate)
GP8	11	30	RUN	
GP9	12	29	GP22	GP22 DIN Data input (alternate)
GND	13	28	GND	
GP10	14	27	GP21	
GP11	15	26	GP20	
GP12	16	25	GP19	
GP13	17	24	GP18	
GND	18	23	GND	
GP14	19	22	GP17	
GP15	20	21	GP16	

Image 3.3: Detailed pinout diagram for the Pico-RGB-LED, showing power, ground, and data input pins.

4. SETUP

Follow these steps to correctly connect the RGB LED Matrix Panel to your Raspberry Pi Pico:

1. **Prepare Raspberry Pi Pico:** Ensure your Raspberry Pi Pico is ready for use and has the necessary firmware or programming environment set up.
2. **Align Headers:** Carefully align the male pinheaders of the Pico-RGB-LED panel with the female headers on your Raspberry Pi Pico. Ensure all pins are correctly aligned before proceeding.
3. **Connect Modules:** Gently press the Pico-RGB-LED panel onto the Raspberry Pi Pico until it is securely seated. Avoid excessive force to prevent bending pins or damaging components.
4. **Verify Connection:** Double-check that the connection is firm and all pins are properly engaged.

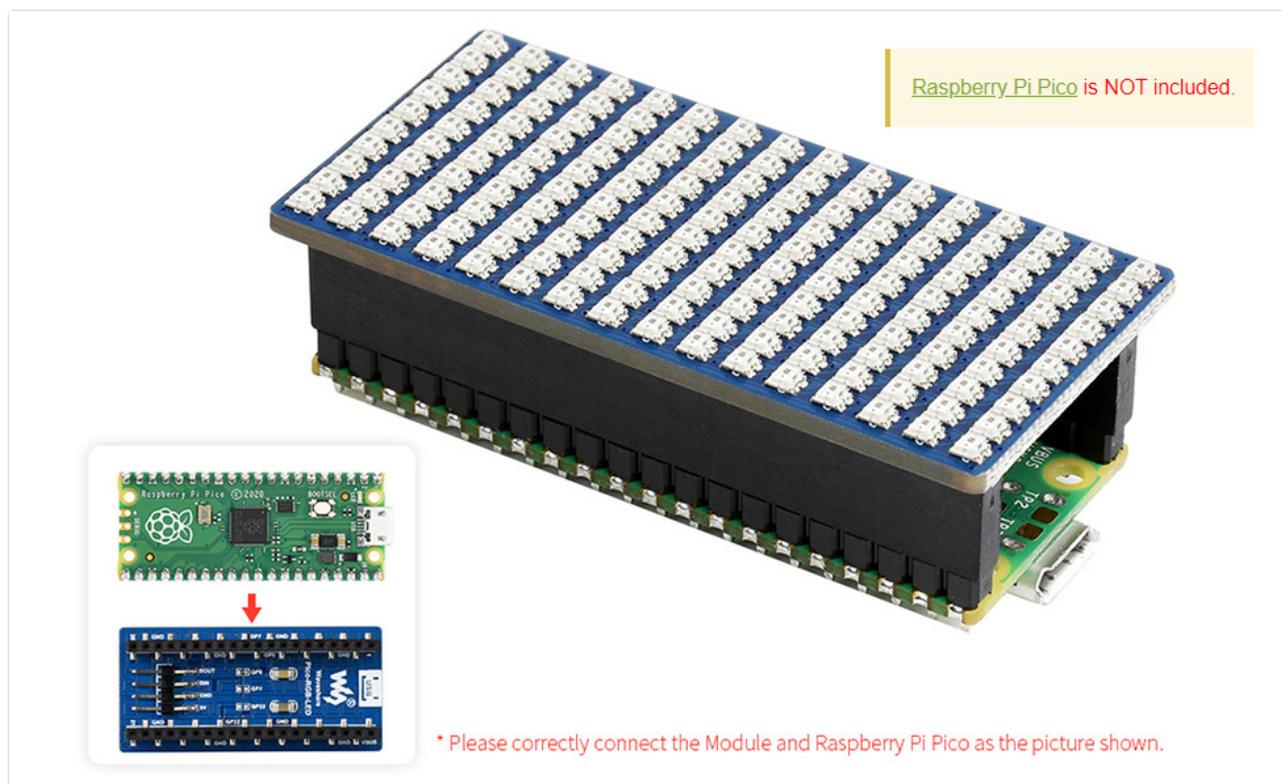


Image 4.1: The Raspberry Pi Pico securely connected to the RGB LED Matrix Panel, demonstrating proper assembly.

5. OPERATING INSTRUCTIONS

The Pico-RGB-LED panel is controlled via the Raspberry Pi Pico. Waveshare provides development resources, including C/C++ and MicroPython examples, to help you get started.

- **Software Setup:** Refer to the official Waveshare Wiki for the Pico-RGB-LED for detailed instructions on setting up your development environment and downloading example code.
- **Programming:** Use the provided examples as a starting point to program various display patterns, animations, or text on the 16x10 LED grid.
- **Data Input Pins:** The default data input pin is GP6 (DIN). Alternate data input pins GP7 and GP22 are

also available for flexible integration.

For comprehensive programming guides and sample code, visit the [Waveshare product page](#) or [Wiki](#) for the Pico-RGB-LED.

6. MAINTENANCE

Proper maintenance ensures the longevity and optimal performance of your LED matrix panel:

- **Cleaning:** Use a soft, dry, anti-static cloth to gently wipe the surface of the LEDs. Avoid using liquid cleaners or abrasive materials.
- **Storage:** When not in use, store the panel in a cool, dry place, away from direct sunlight and excessive dust. Keep it in its original packaging or an anti-static bag.
- **Handling:** Always handle the board by its edges to prevent damage to components or the LED array.

7. TROUBLESHOOTING

If you encounter issues with your Pico-RGB-LED panel, consider the following common problems and solutions:

- **LEDs Not Lighting Up:**
 - Check power connections to the Raspberry Pi Pico and ensure it is powered on.
 - Verify that the Pico-RGB-LED panel is correctly seated on the Raspberry Pi Pico's headers.
 - Ensure your code is running and sending data to the correct GPIO pins (GP6, GP7, or GP22).
- **Incorrect Display Patterns/Colors:**
 - Review your programming code for logic errors or incorrect color definitions.
 - Confirm that the correct data input pin is selected in your software configuration.
 - Check for any loose connections between the panel and the Pico.
- **Flickering LEDs:**
 - Ensure your power supply is stable and provides sufficient current.
 - Check for any electromagnetic interference (EMI) from nearby devices.

If these steps do not resolve the issue, refer to the [Waveshare online resources](#) or contact technical support.

8. SPECIFICATIONS

The following table details the technical specifications of the Waveshare Pico-RGB-LED Matrix Panel:

Feature	Specification
---------	---------------

Feature	Specification
Model Name	Pico-RGB-LED
LED Type	0807 RGB LEDs
LED Grid	16 × 10 (160 RGB LEDs)
Compatibility	Raspberry Pi Pico series
Interface	Standard Raspberry Pi Pico header, Right-angled 2.54mm pitch male pinheader
Controller IC	Integrated single wire cascading constant current driver IC
Product Dimensions	54.00 mm × 26.00 mm (approx. 2.13 x 1.02 inches)
Item Weight	0.352 ounces

Outline Dimensions

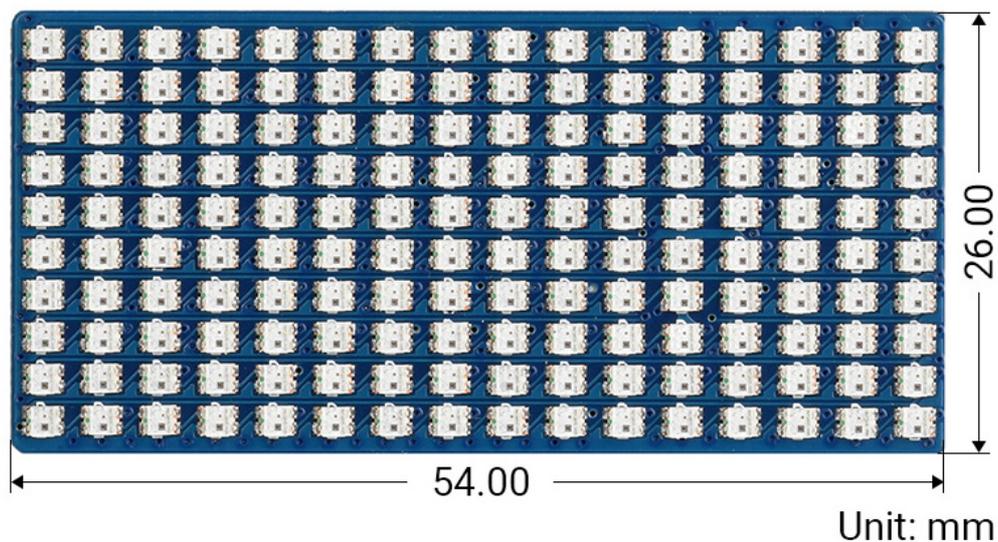


Image 8.1: Outline dimensions of the Pico-RGB-LED module in millimeters.

9. WARRANTY AND SUPPORT

Waveshare products are designed for reliability and performance. For warranty information, please refer to the terms and conditions provided at the time of purchase or on the official Waveshare website.

Waveshare offers professional technical support and a wealth of development resources, including user manuals, circuit diagrams, example code, and other development materials. These resources are available to assist you with the setup, operation, and troubleshooting of your Pico-RGB-LED panel.

Resources & Services



WAVESHARE
ORIGINAL ✓



PROFESSIONAL
TECH SUPPORT



RICH RESOURCES
MANUAL & DEMO



User Manual



Circuit Diagram



Example Code



Dev Resources

* Resources for different product may vary, please check the wiki page to confirm the actually provided resources.

Image 9.1: Overview of available Waveshare resources and services, including user manuals and technical support. For the most up-to-date resources and support, please visit the official Waveshare website or the product's dedicated Wiki page.