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› DIYmall 12-Bits WS2812B RGB LED Ring Instruction Manual

DIYmall 12-Bits

DIYmall 12-Bits WS2812B RGB LED Ring User Manual

Model: 12-Bits

INTRODUCTION

This manual provides essential information for the proper setup, operation, and maintenance of your DIYmall 12-Bits WS2812B RGB LED Ring. Please read these instructions carefully before use to ensure optimal performance and longevity of the product.



Image: The DIYmall 12-Bits WS2812B RGB LED Ring, showcasing its circular design with 12 individual RGB LEDs.

PRODUCT OVERVIEW

The DIYmall 12-Bits WS2812B RGB LED Ring is a compact, addressable LED module designed for various lighting and display projects. Each ring features 12 integrated WS2812B 5050 RGB LED chips, allowing for individual control of color and brightness for each LED. It operates on a DC 5V power supply and utilizes single-wire communication for data transfer, making it compatible with microcontrollers like Arduino and Raspberry Pi.

Key Features:

- **LED Chip:** WS2812B 5050 RGB
- **Number of LEDs:** 12 bits per ring
- **Communication:** Single-wire protocol
- **Voltage:** DC 5V
- **Programmability:** Individual control of each LED's color and brightness



Image: Multiple WS2812B RGB LED rings illuminated in green, blue, and red, demonstrating their full-color capabilities.

SPECIFICATIONS

Feature	Specification
Brand	DIYmall
Model Name	WS2812B RGB LED Ring
Model Number	12-Bits
LED Chip	WS2812B 5050 RGB
Voltage	DC 5V
Light Type	LED
Light Color	Full Color (RGB)
Special Feature	Programmable RGB Lighting
Connectivity Protocol	Single-wire communication

Feature	Specification
Control Method	App (via microcontroller programming)
Indoor/Outdoor Usage	Indoor
Material Type	Metal
Incandescent Equivalent Wattage	0.72 Watts

Outside Diameter: 37mm(1.45in)



Image: A close-up view of the LED ring showing its dimensions: Outside Diameter: 37mm (1.45in), Inside Diameter: 23mm (0.9in).

SETUP INSTRUCTIONS

The WS2812B RGB LED Ring requires a 5V DC power supply and a microcontroller (e.g., Arduino, Raspberry Pi) for control. The LED ring does not come with cables, so you will need to provide your own wiring.

Wiring Connections:

- 5V (Power):** Connect the 5V pin on the LED ring to the 5V output of your microcontroller or external 5V power supply.

2. **GND (Ground):** Connect the GND pin on the LED ring to the Ground pin of your microcontroller or power supply. Ensure common ground between the LED ring and the microcontroller.
3. **DI (Data Input):** Connect the DI (Data In) pin on the LED ring to a digital output pin on your microcontroller (e.g., Arduino Pin 6).

Important: Ensure your power supply can provide sufficient current for all LEDs at full brightness. Each WS2812B LED can draw up to 60mA at full white brightness. For 12 LEDs, this would be approximately 720mA (0.72A).

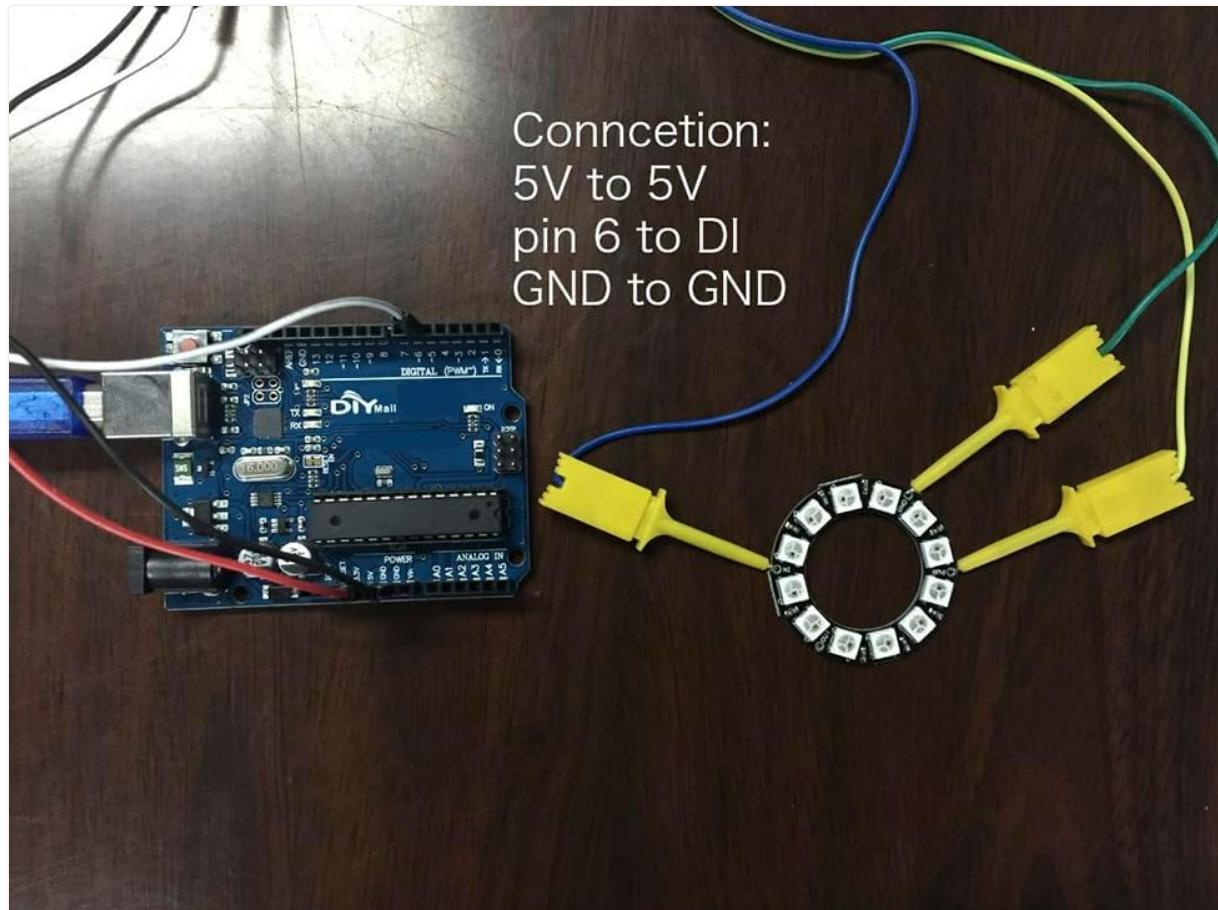


Image: A visual guide showing the connection of the LED ring to an Arduino board. The connections are labeled: 5V to 5V, GND to GND, and a digital pin (Pin 6) to DI (Data In).

OPERATING INSTRUCTIONS

To operate the WS2812B RGB LED Ring, you will need to program your microcontroller using a suitable library, such as the Adafruit NeoPixel library for Arduino. This library simplifies the process of controlling individual WS2812B LEDs.

Programming Steps (Example with Arduino):

1. **Install Library:** Open your Arduino IDE, go to Sketch > Include Library > Manage Libraries.... Search for "Adafruit NeoPixel" and install it.
2. **Basic Code Structure:**

```

#include <Adafruit_NeoPixel.h>

#define LED_PIN 6 // Digital pin connected to the DI pin of the LED ring
#define LED_COUNT 12 // Number of LEDs in the ring

Adafruit_NeoPixel strip(LED_COUNT, LED_PIN, NEO_GRB + NEO_KHZ800);

void setup() {
  strip.begin(); // Initialize NeoPixel strip object (this starts the strip)
  strip.show(); // Turn all LEDs off (clear the strip)
  strip.setBrightness(50); // Set brightness (0-255)
}

void loop() {
  // Example: Set the first LED to red
  strip.setPixelColor(0, strip.Color(255, 0, 0)); // LED 0, Red
  strip.show(); // Update the LED colors
  delay(500);

  // Example: Cycle through colors
  for(int i=0; i<LED_COUNT; i++) {
    strip.setPixelColor(i, strip.Color(0, 0, 255)); // Set LED i to Blue
    strip.show();
    delay(50);
  }
  delay(1000);

  // Turn all LEDs off
  for(int i=0; i<LED_COUNT; i++) {
    strip.setPixelColor(i, strip.Color(0, 0, 0));
  }
  strip.show();
  delay(500);
}

```

3. **Upload Code:** Connect your microcontroller to your computer, select the correct board and port in the Arduino IDE, and upload the code.

You can modify the `setPixelColor()` function to control each LED individually by specifying its index (0 to 11 for a 12-bit ring) and its RGB color values (0-255 for each color component). The `setBrightness()` function allows you to adjust the overall intensity of the LEDs.

MAINTENANCE

The DIYmall WS2812B RGB LED Ring is designed for durability, but proper care can extend its lifespan.

- **Cleaning:** If necessary, gently wipe the surface with a dry, soft cloth. Avoid using liquids or abrasive cleaners.
- **Storage:** Store the LED ring in a dry environment, away from direct sunlight and extreme temperatures.
- **Handling:** Handle the circuit board by its edges to avoid damaging components or creating static discharge.
- **Power:** Always ensure the correct 5V DC power supply is used. Over-voltage can permanently damage the LEDs.

TROUBLESHOOTING

If you encounter issues with your LED ring, refer to the following common problems and solutions:

- **LEDs do not light up:**

- Check all wiring connections (5V, GND, DI) to ensure they are secure and correctly connected.
- Verify that the power supply is providing 5V DC and sufficient current.
- Ensure the microcontroller is powered on and the code has been successfully uploaded.
- Double-check the LED_PIN and LED_COUNT definitions in your code match your setup.

- **Only the first few LEDs light up, or colors are incorrect:**

- This often indicates a data signal issue. Check the connection from your microcontroller's data pin to the LED ring's DI pin.
- Ensure the NEO_GRB + NEO_KHZ800 setting in the NeoPixel constructor matches the LED type (WS2812B typically uses GRB).
- A weak power supply can also cause issues down the strip. Ensure adequate current.

- **Flickering or unstable colors:**

- Ensure a stable 5V power supply. Voltage drops can cause flickering.
- Add a large capacitor (e.g., 1000uF, 6.3V or higher) across the 5V and GND lines near the LED ring to smooth out power fluctuations.
- Consider adding a 300-500 Ohm resistor in series with the data line to protect the first LED.

WARRANTY AND SUPPORT

This DIYmall product comes with a **1-year manufacturer's warranty** covering defects in materials and workmanship.

For technical support, additional resources, or warranty claims, please visit the official DIYmall store or contact their customer service through the platform where the product was purchased.

DIYmall Store: [Visit DIYmall Store on Amazon](#)