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Adafruit Industries 1138

Adafruit NeoPixel Digital RGB LED Weatherproof Strip 60 LED-3 Meter Instruction Manual

Model: 1138 | Brand: Adafruit Industries

1. Introduction

This manual provides essential information for the proper setup, operation, maintenance, and troubleshooting of your Adafruit NeoPixel Digital RGB LED Weatherproof Strip. This 3-meter strip features 60 individually addressable RGB LEDs per meter, designed for various lighting applications. Please read this manual thoroughly before use to ensure safe and optimal performance.

2. Safety Information

- **Power Supply:** This LED strip requires a 5VDC power supply. *Do not exceed 6VDC*, as this can permanently damage the strip.
- **Polarity:** The strip has no polarity protection. Ensure correct positive and negative connections to avoid damage.
- **Current Draw:** Each 0.65-inch segment can draw up to 60mA when all LEDs are at full brightness. A 3-meter strip with 60 LEDs per meter (approximately 180 LEDs total) can draw up to 18 Watts (3.5 Amps @ 5V) when all LEDs are on full white. A robust power supply, such as a 5V 10A supply, is recommended for optimal performance, especially for colorful designs which typically draw 1/3 to 1/2 of the maximum current.
- **Controller Compatibility:** The NeoPixel protocol is highly timing-specific. It can only be controlled by microcontrollers with highly repeatable 100nS timing precision. Example code is available for Arduino Uno/Mega microcontrollers at 8MHz and 16MHz. It will *not* work with Raspberry Pi, Basic Stamp, NETduino, any other interpreted/virtual machine microprocessor, or any processor slower than 8 MHz.
- **Weatherproofing:** The strip features a removable IP65 weatherproof casing, offering protection against dust and low-pressure water jets. It is suitable for indoor use and protected outdoor environments, but not for submersion.

3. Product Overview

The Adafruit NeoPixel Digital RGB LED Weatherproof Strip is a versatile lighting solution featuring individually addressable RGB LEDs. This particular model is 3 meters long and contains 60 LEDs per meter.



Figure 3.1: The Adafruit NeoPixel LED strip, coiled on its reel, showcasing its vibrant RGB capabilities. This image illustrates the product as it might be received, ready for deployment.



Figure 3.2: A detailed view of the unrolled Adafruit NeoPixel LED strip, highlighting the individual RGB LEDs and the flexible white PCB. This image demonstrates the strip's design and the appearance of the LEDs when illuminated.

Key Features:

- **LED Density:** 60 LEDs per meter, providing high-density illumination.
- **Individual Control:** Each RGB LED is individually controllable, allowing for complex lighting patterns and animations.
- **Weatherproof Casing:** Removable IP65-rated casing for protection against environmental elements.
- **Compact Design:** 12.5mm wide (10mm without casing), 4mm thick with casing.
- **Flexible PCB:** Features a white-colored flex PCB for less visibility against light surfaces.
- **Connector:** Typically comes with a 2-pin JST SM connector, with separated power/ground wires.
- **LED Chip:** Utilizes WS2812B 4-pin chip LEDs (compatible with WS2812S).

4. Setup

1. **Unpack the Strip:** Carefully remove the LED strip from its packaging. Note that it may be a cut piece from a larger reel and may or may not have a connector attached.

2. **Prepare Power Supply:** Connect a stable 5VDC power supply to the strip. Ensure the power supply can provide sufficient current for the length of the strip you are using. For a 3-meter strip, a 5V 10A power supply is highly recommended. Connect the positive (+) wire from the power supply to the 5V input on the strip, and the negative (-) wire (GND) to the GND input on the strip. Pay close attention to polarity.
3. **Connect to Microcontroller:** Connect the data input pin of the LED strip to a digital output pin on your compatible microcontroller (e.g., Arduino Uno/Mega). Also, ensure a common ground connection between the microcontroller and the LED strip's power supply.
4. **Prepare Software:** Download and install the appropriate NeoPixel library for your microcontroller. Adafruit provides example code for Arduino, which is highly recommended for getting started.
5. **Mounting (Optional):** If desired, mount the LED strip to your chosen surface. The weatherproof casing can be removed if a slimmer profile is needed, reducing the width from 12.5mm to 10mm.

5. Operating

Operating the NeoPixel strip primarily involves programming your microcontroller to send the desired data signals. The strip does not have an external controller or remote control in its basic configuration; control is entirely through the connected microcontroller.

- **Programming:** Use the NeoPixel library and example code to write sketches (for Arduino) or programs that define the color and brightness of each individual LED.
- **Color Control:** Each LED is an RGB type, meaning you can set its red, green, and blue components to create millions of colors.
- **Brightness Adjustment:** The overall brightness of the strip can be controlled through your code. Be mindful of power consumption when setting high brightness levels, especially for all-white illumination.
- **Animations:** The individual addressability allows for complex animations, chases, fades, and other dynamic lighting effects.

6. Maintenance

- **Cleaning:** If the strip becomes dirty, gently wipe it with a soft, dry cloth. For stubborn dirt, a slightly damp cloth can be used, ensuring the strip is powered off and completely dry before re-applying power. Avoid harsh chemicals or abrasive materials.
- **Casing:** The IP65 weatherproof casing is removable. If it becomes damaged or needs cleaning, it can be carefully removed and re-installed. Ensure it is properly sealed if maintaining weather resistance is critical.
- **Storage:** When not in use, store the LED strip in a cool, dry place, away from direct sunlight and extreme temperatures. Avoid sharp bends or kinks that could damage the internal circuitry.

7. Troubleshooting

Problem	Possible Cause	Solution

Problem	Possible Cause	Solution
Strip does not light up.	• No power or incorrect voltage. • Incorrect polarity. • Faulty connection. • Microcontroller not sending data.	• Verify 5VDC power supply is connected and providing power. • Check positive and negative connections. • Inspect all wiring, especially the 2-pin JST SM connector. • Ensure microcontroller is powered and running the correct code.
Only first few LEDs light up, or erratic behavior.	• Insufficient power supply current. • Data signal integrity issue.	• Upgrade to a higher current power supply (e.g., 5V 10A). • Ensure data wire is not too long or shielded if necessary. Add a 300-500 Ohm resistor in series with the data line.
Colors are incorrect or flickering.	• Timing issues with microcontroller. • Grounding issues.	• Ensure your microcontroller meets the 100nS timing precision requirement. • Verify common ground connection between power supply, strip, and microcontroller.

8. Specifications

Feature	Detail
Model Number	1138
LED Type	Digital RGB (WS2812B 4-pin chip LED)
LEDs per Meter	60
Strip Length	3 Meters
Dimensions (with casing)	12.5mm (0.65") wide, 4mm (0.16") thick
Dimensions (without casing)	10mm wide
Segment Length	16.7mm (0.65") per segment
Input Voltage	5VDC (Do not exceed 6VDC)
Max Current Draw (per 0.65" segment)	60mA (all LEDs on full brightness)
Max Power Consumption (3m strip)	18 Watts (3.5 Amps @ 5V, all LEDs on full white)
LED Wavelengths	630nm (Red), 530nm (Green), 475nm (Blue)
Connector Type	2-pin JST SM (typical)
Weather Resistance	Removable IP65 weatherproof casing
Control Method	Microcontroller with timing-specific protocol
Weight	6.2 ounces (approx. for 3m)

9. Warranty Information

Specific warranty details for the Adafruit NeoPixel Digital RGB LED Weatherproof Strip are not provided in this manual. For information regarding warranty coverage, terms, and conditions, please refer to the official Adafruit Industries website or contact the seller from whom you purchased the product. Keep your proof of purchase for any warranty claims.

10. Support

If you encounter issues that cannot be resolved using the troubleshooting guide, or if you require further assistance, please contact Adafruit Industries directly through their official support channels. You may also reach out to the seller from whom you purchased the product for support.
For technical resources, tutorials, and community forums, visit the Adafruit website:www.adafruit.com

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