GLEDOPTO GL-C-015WL-D

GLEDOPTO ESP32 WLED Digital LED Controller with Mic / UART User Manual

Model: GL-C-015WL-D

1. Introduction

This manual provides essential instructions for the installation, operation, and maintenance of your GLEDOPTO ESP32 WLED Digital LED Controller (Model GL-C-015WL-D). Please read this manual thoroughly before using the product to ensure proper function and safety.

2. Important Safety Information

- The controller chip is ESP32. Verify firmware version information carefully before upgrading. Incorrect firmware upgrades can damage the product.
- Ensure the input voltage (5-24V DC) matches your power supply and LED strip requirements.
- Do not exceed the maximum output current of 10A per channel or 15A total.
- Operate the device within the specified temperature range of -20 to 45 °C.
- This product is designed for indoor use only.
- Disconnect power before performing any wiring or maintenance.

3. Product Overview

3.1 Package Contents

- 1 x GLEDOPTO ESP32 WLED Digital LED Controller with Mic / UART (Model: GL-C-015WL-D)
- 1 x User Manual
- 1 x 3cm Damper

3.2 Key Features

- **ESP32 Chip:** High-performance processing and stable network connectivity.

- **Integrated Microphone:** Captures ambient sounds for music synchronization and dynamic lighting effects.
- **UART Download Port:** Facilitates firmware upgrades and debugging without complex hardware operations.
- **Simple Wiring & Expandability:** Easy connection ports and an added IO33 port for customization.
- **Rich Dynamic Modes:** Over 100 dynamic lighting effects available.
- **Wide Compatibility:** Supports various addressable LED strips including WS2811, WS2812, WS2812B, FL19038, SK6812, SM16703P, SM16703SP3, TM1814, WS2813, WS2815, and FCOB.
- **Low Power Consumption:** Integrated switching regulator for ESP32 power and a MOSFET relay to disable output power when WLED is off.

4. Specifications

Model Number	GL-C-015WL-D
Input Voltage	DC 5-24V
Max Addressable ICs	800
Output Current per Channel	10A Max
Total Output Current	15A Max
Dimensions	108 x 45 x 18 mm
Operating Temperature	-20 to 45 °C
Supported LED Strip ICs	WS2811, WS2812, WS2812B, FL19038, SK6812, SM16703P, SM16703SP3, TM1814, WS2813, WS2815, FCOB, etc.
Connectivity	WiFi (ESP32)
Special Features	Dimmable, Microphone Function, UART Port

5. Setup and Installation

5.1 Controller Layout

Figure 1: GLEDOPTO ESP32 WLED Digital LED Controller. This image displays the top view of the controller, highlighting its input

and output terminals, model number (GL-C-015WL-D), and various features such as the UART port and microphone icon.

5.2 Wiring Instructions

Follow these steps for proper wiring of your LED strip to the controller:

Figure 2: Wiring Diagram. This image shows the top view of the GLEDOPTO controller with wires connected, illustrating the V=VCC, D=DATA, and G=GND connections. It indicates that the group of D for GPIO16 is the default output and should be used first.

- Connect the positive (+) terminal of your power supply to the V+ input on the controller.
- Connect the negative (-) terminal of your power supply to the V- input on the controller.
- Connect the VCC wire from your LED strip to the V output terminal on the controller.
- Connect the DATA wire from your LED strip to the D (GPIO16) output terminal on the controller. This is the default output. The other D (GPIO2) can be used after configuration in the app.
- Connect the GND wire from your LED strip to the G output terminal on the controller.

5.3 Quick Connect Port Design

The controller features a quick connect port design for convenient wiring:

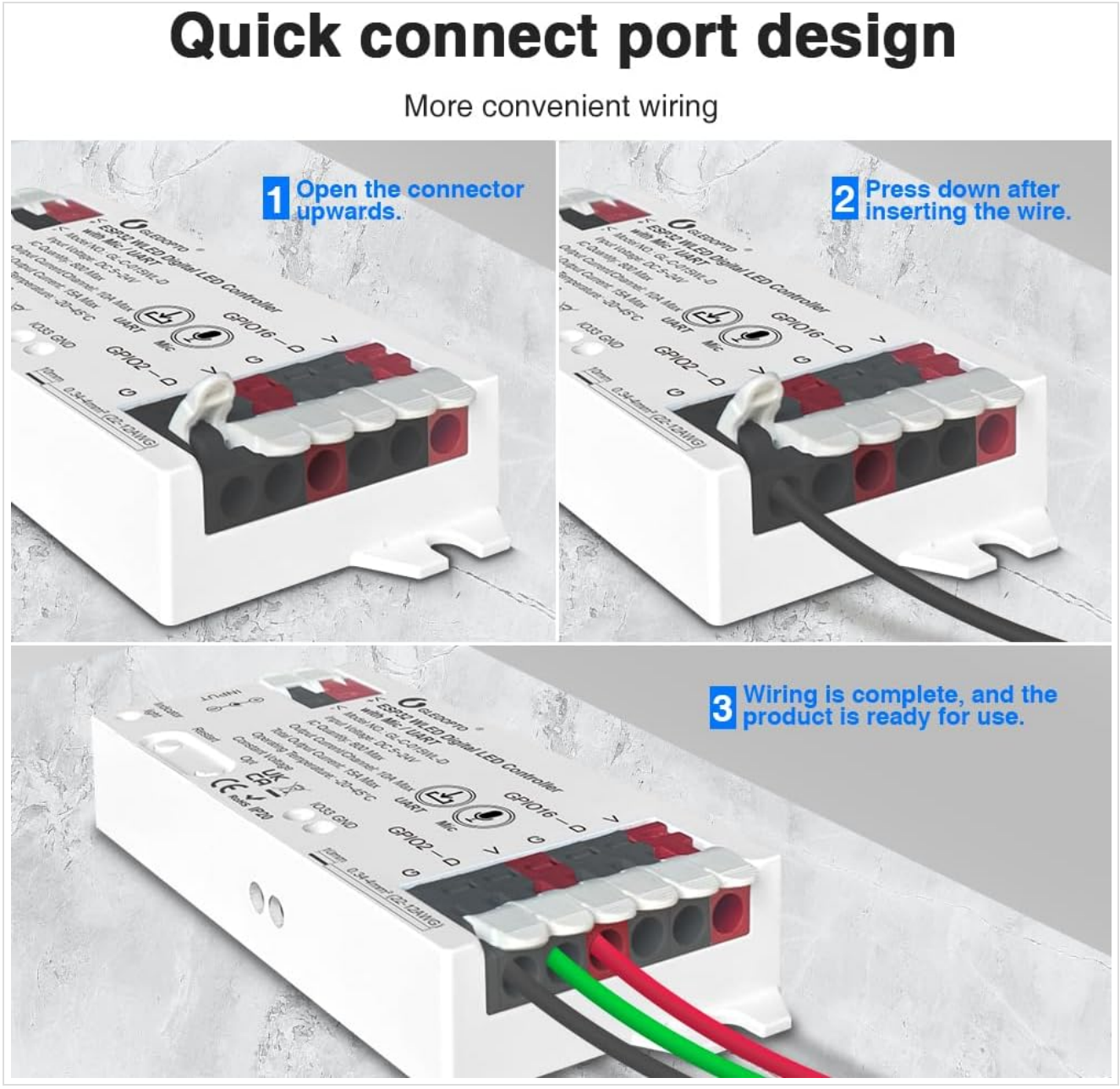


Figure 3: Quick Connect Port Design. This image illustrates the three steps for wiring: 1. Open the connector upwards, 2. Press down after inserting the wire, and 3. Shows the completed wiring with wires securely in place, indicating the product is ready for use.

1. Open the connector upwards.
2. Insert the stripped wire into the port.
3. Press down on the connector to secure the wire.

6. Operation

6.1 Button Functions

The controller has two physical buttons for basic control:

Figure 4: Button Functions. This close-up image of the GLEDOPTO controller highlights the 'Restart' and 'Opt' buttons. It details that the 'Restart' button powers off and on the controller, useful for restarting after microphone configuration. The 'Opt' button has functions for short press (power on/off), long press for 1 second (switch colors), and long press for 10 seconds (reset WLED controller and activate WLED-AP hotspot).

- **Restart Button:** Pressing this button will temporarily power off the controller module. Releasing it will power it back on. This is useful for restarting the controller after configuring the microphone or other settings.
- **Opt Button:**
  - **Short Press:** Powers the device on or off.
  - **Long Press (1 second):** Switches between available colors or effects.
  - **Long Press (10 seconds):** Resets the WLED controller and activates the WLED-AP hotspot for initial setup or re-configuration.

6.2 App Control

The GLEDOPTO controller is primarily managed through the WLED application, offering extensive control over your LED strips.

6.2.1 Dynamic Effects

The WLED app provides access to over 100 dynamic lighting effects, allowing for personalized ambiance.

Figure 5: Dynamic Effects in WLED App. This image shows a smartphone screen displaying the WLED application interface, listing various dynamic lighting effects such as Solid, Android, Aurora, Blends, Blink, and Bouncing Balls, demonstrating the wide range of options available.

6.2.2 Segmented Color Control

Customize individual segments of your LED strip to display different colors simultaneously.

Figure 6: Segmented Color Control. This image depicts a bedroom setting with an LED strip installed behind the bed, showcasing the segmented color control feature where different sections of the strip illuminate with distinct colors, allowing for personalized lighting designs.

6.2.3 Microphone Function

The built-in microphone allows the LED lights to synchronize with music or ambient sounds, creating immersive audio-reactive lighting experiences.

Figure 7: Microphone Function in Action. This image shows a mother and child dancing in a living room, which is illuminated by colorful LED lights that are reacting to music, demonstrating the controller's microphone function for audio-reactive lighting.

Figure 8: Built-in Sensitive Microphone. This lifestyle image places the GLEDOPTO WLED controller in a modern kitchen environment, with colorful musical notes emanating from it, visually emphasizing the built-in sensitive microphone feature that allows lights to react to sound.

6.3 Alexa Integration

The controller supports integration with Amazon Alexa for voice control. Follow these steps to connect:

1. Go to the control page of the WLED controller, click on the "Config" button in the top right corner to enter the settings, and then click on "Sync Interfaces".
2. Scroll up to find "Alexa Voice Assistant", check the box next to "Emulate Alexa device", and then save.
3. After successfully saving, power cycle the WLED controller once by turning it off and on.
4. Open "Amazon Alexa," click on the "Devices" page at the top right corner on the "+" sign, and then click "Add Device."
5. Then, scroll up and click on "Other" to enter, select "Wi-Fi," and then click "Discover Devices" to search for lights.

Figure 9: Steps for Connecting with Alexa. This image presents a series of smartphone screenshots, guiding users through the process of integrating the WLED controller with Amazon Alexa. It shows navigating through WLED app settings to enable Alexa emulation and then using the Amazon Alexa app to discover and add the device.

1. Go to the control page of the WLED controller in the app, click on the "Config" button in the top right corner to enter the settings, and then click on "Sync Interfaces".
2. Scroll up to find "Alexa Voice Assistant", check the box next to "Emulate Alexa device", and then save.
3. After successfully saving, power cycle the WLED controller once by turning it off and on.
4. Open the Amazon Alexa app, click on the "Devices" page at the top right corner on the "+" sign, and then click "Add Device".
5. Then, scroll up and click on "Other" to enter, select "Wi-Fi", and then click "Discover Devices" to search for lights.

7. Firmware Updates

The integrated UART port allows for convenient firmware updates. Refer to the official WLED documentation or GLEDOPTO support resources for detailed instructions on how to perform firmware updates. Always ensure you are using the correct firmware version for your ESP32 chip to prevent damage.

8. Maintenance

- Keep the controller clean and free from dust. Use a dry, soft cloth for cleaning.
- Avoid exposing the controller to moisture or extreme temperatures.
- Ensure proper ventilation around the device to prevent overheating.

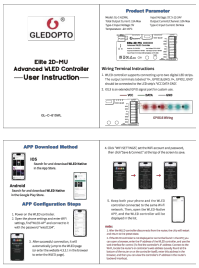
9. Troubleshooting

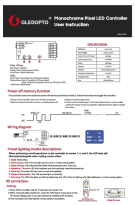
- **Controller not powering on:** Check power supply connections and ensure the input voltage is within the 5-24V DC range.
- **LED strip not lighting up:** Verify all wiring connections (VCC, DATA, GND) are secure and correct. Ensure the LED strip type is supported by the controller.
- **No Wi-Fi connection:** Perform a long press (10 seconds) on the Opt button to reset the controller and activate the WLED-AP hotspot for re-configuration. Ensure your router is operating on a 2.4GHz band.
- **Alexa integration issues:** Double-check that "Emulate Alexa device" is enabled in the WLED app settings and that you have power cycled the controller after saving. Ensure the Alexa app is discovering devices on the correct network.
- **Incorrect colors or effects:** Verify the LED strip type and IC settings in the WLED app.

10. Warranty and Support

For warranty information and technical support, please refer to the GLEDOPTO official website or contact your retailer. Keep your purchase receipt for warranty claims.

Related Documents - GL-C-015WL-D

	GLEDOPTO WLED Series LED Strip Controller User Instruction User manual for GLEDOPTO WLED Series LED Strip Controllers (GL-C-014WL, GL-C-015WL, GL-C-015WL-M, GL-C-015WL-D), covering wiring, app configuration, troubleshooting, and features.
	GLEDOPTO ESP32 WLED Digital LED Controller User Instruction User instructions for the GLEDOPTO ESP32 WLED Digital LED Controller (GL-C-016WL-D), covering wiring, app configuration, relay and mic setup, reset procedures, and troubleshooting.
	GLEDOPTO Elite 2D-MU Advanced WLED Controller GL-C-615WL User Manual Comprehensive user manual for the GLEDOPTO Elite 2D-MU Advanced WLED Controller (Model GL-C-615WL). Learn about product specifications, wiring, app setup, configuration, troubleshooting, and safety guidelines for smart LED lighting.

	[GLEDOPTO GL-C-I-213 Monochrome Pixel LED Controller User Manual] User instructions for the GLEDOPTO GL-C-I-213 Monochrome Pixel LED Controller. Learn about specifications, power-off memory, wiring, RF connection, modes, and troubleshooting.
	[GLEDOPTO ESP32 WLED Digital LED Controller User Instruction] User manual for the GLEDOPTO ESP32 WLED Digital LED Controller (GL-C-016WL-D), detailing wiring, app setup, configuration, troubleshooting, and safety information.
	[GLEDOPTO Elite 2D-EXMU GL-C-616WL Advanced WLED Controller User Manual] Comprehensive user manual for the GLEDOPTO Elite 2D-EXMU GL-C-616WL Advanced WLED Controller. Provides detailed information on product parameters, wiring instructions, app and Ethernet configuration, LED strip and relay setup, microphone functionality, button operations, factory reset procedures, troubleshooting, safety precautions, and technical specifications.