

Negative Control Dimming Module Circuit Schematic



AI Overview

A negative control dimming module typically uses a current-sinking 0-10V input to adjust light output, where 0V corresponds to full dimming and 10V to full brightness.

Overview A negative control dimming module operates by sinking current from the LED driver's 0-10V control line. In this configuration, the LED driver acts as a voltage source, and the dimmer reduces the voltage by drawing current, effectively dimming the light. This is common in commercial LED systems where the dimmer is designed to pull the control voltage down to adjust brightness.

Basic Circuit Components

- LED Driver (Voltage Source):** Provides a constant 0-10V output for dimming control.
- Control Input (Dimmer Module):** Connects to the +DIM and -DIM lines of the driver.
- Current-Sinking Element:** Typically a MOSFET or transistor that pulls the +DIM line toward 0V.
- Potentiometer or DAC:** Provides adjustable control voltage to the gate/base of the MOSFET.
- Resistors:** Limit current and set the dimming curve.
- Optional Microcontroller:** For digital control, zero-cross detection, or PWM-based dimming.

Example Negative Control Circuit

```
CodeCopy
+12V (from driver) ----+----+DIM
| R1 | Potentiometer | Gate of N-MOSFET | GND -----+---- -DIM
```

Operation: The MOSFET acts as a current sink. When the potentiometer is adjusted, it changes the gate voltage, controlling how much current is drawn from the +DIM line. At maximum sink (gate fully on), the voltage at +DIM approaches 0V, dimming the light to minimum. At minimum sink (gate off), +DIM remains near 10V, giving full brightness.

Advanced Considerations

- Microcontroller Integration:** Using an MCU (e.g., STM32 series) allows precise dimming curves, touch or push-button interfaces, and zero-cross detection for AC loads.
- Triac-Based Negative Control:** For AC dimming, a triac can be triggered in a phase-cut configuration, with the MCU controlling the gate in...

Article Content

How to Add a Dimmer Facility to a LED Bulb

LED bulbs come with a built in SMPS driver within their holder cabinet, and an SMPS circuit makes it difficult to operate or control through a triac dimmer switches, until and unless its suitably modified for

0 10V Dimming Wiring Diagram and Installation Guide

Detailed guide on 0-10V dimming wiring diagram, providing clear instructions for proper installation and wiring connections to ensure smooth dimming control in lighting systems.

Wireless AC Light Dimmer with Bluetooth & Arduino

Here is a circuit diagram for 220V Wireless AC Light Dimmer with Android Bluetooth, TRIAC & Arduino. The schematic has been designed using EasyEDA online PCB Designing tool.

Microcontrollers and triac-based dimmers

The presented circuits are a universal motor drive, and a light dimmer operating from the 110/240 V mains. The motor drive can be adapted, for instance, to vacuum cleaners, food processors, drills, or

Triac AC Dimmer/Speed Regulator – Random Thoughts

Next schematic is really a simple variant of the first schematic but with the addition of one L-C filter in the feed line, just to suppress RFI. Now you've a basic lamp dimmer circuit with RFI

0-10 V Control Topology APP NOTE (048587)

For the control, it is the shape of the curve plotted using the commanded % of light from the system (for example, the dimmer's slider position) against the output voltage on the 0-10 V line.

TI Reference Designs Library

Accelerate your system design and time to market with tested schematics, BOMs and design files from TI's reference design library.

NE555 PWM Circuit Diagram | LED Dimmer

Here is the NE555 PWM circuit diagram for dimming an LED or controlling the speed of a DC motor. I suggest these circuit by using the principle of PWM (pulse width modulation) form.

Dimmer-Control

PRODUCT DESCRIPTION Remotely controlled light dimming module is designed to work with various types of light sources. It may be connected to two-wire or three-wire configuration so it can operate

How to Use AC Dimmer Lamp Module: Examples, Pinouts, and Specs

Learn how to use the AC Dimmer Lamp Module with detailed documentation, including pinouts, usage guides, and example projects. Perfect for students, hobbyists, and developers integrating the AC

How to Build an Isolated Digital AC Dimmer Using Arduino

How to Build an Isolated Digital AC Dimmer Using Arduino: Disclaimer: This circuit is connected directly to the mains voltage. You must care about all safety precautions before using the device.

How to Add a Dimmer Facility to a LED Bulb

In this article I have explained how to make an LED dimmer circuit for enabling a dimming facility to any mains operated LEDs bulb.

How to build a digital AC dimmer [Using Arduino]

Figure-2, Schematic diagram of the digital AC dimmer : Circuit Analysis and Introducing Components R1, R2, IC1, D1, and C3 build the zero crossing detector circuit. It is designed to make

Ac Dimmer Remote PCB

In this project I'm going to show how to a remote used to control the circuit for the Dimmer, so that the lamp brightness is controlled from IR remote

0-10V Dimming: A Technical Guide

To determine the minimum dimming voltage on a group of fixtures, simply multiply the total number of drivers on the control circuit by the voltage loss for a single driver, assuming identical fixtures.

How to Wire LED Dimmers: Complete Guide with Safety Precautions

LED dimmers have revolutionized the way we control lighting in various settings, from homes and offices to commercial and industrial spaces. They offer the flexibility to adjust the

0-10V Dimmer Wiring Diagram Guide

Learn how to wire a 0-10V dimmer with this detailed wiring diagram. Step-by-step instructions for safe and correct installation of dimming control systems.

AC Light Dimmer Circuit – Homemade Circuit Projects

In this post I have explained through two examples how to build a simple 110 V or 220 V AC light dimmer circuit for controlling light intensity with

How to build an isolated digital AC dimmer using Arduino

By Hesam Moshiri, Anson Bao Disclaimer: This circuit is connected directly to the mains voltage. You must care about all safety precautions before using the device. AC loads are

Dimmer circuit using SCR

We put the parts includes S2, LDR, and RA-33K, 1/2W or RB to the AC dimmer circuit. Turn-on a switch-S2, this circuit becomes the automatic light switch circuit.

Building a DIY LED Dimmer Circuit: Complete Schematic Guide

This article provides a detailed schematic diagram of a LED dimmer circuit, explaining how it works and providing step-by-step instructions for building and implementing it in various lighting applications.

NE555 PWM Circuit Diagram | LED Dimmer

Learn how to use NE555 or LM555 in a PWM circuit. It can be used as an LED dimmer, a motor controller, or for controlling other loads.

An In-Depth Guide to 0-10V Dimming Wiring Methods: An Illuminating

Discover the various wiring methods for 0-10v dimming systems, including the use of control cables and voltage regulators. Learn how to wire and control lighting fixtures with 0-10v dimming capabilities for

Designing a Trailing Edge Dimmer Circuit – Nothing Untoward

That explains why we can't use a TRIAC as the switching element of a phase-control dimmer. But why is it commonly said that trailing edge dimmers are preferred over leading edge for

AC Dimmer Circuit | DXARTS: Digital Arts & Experimental Media ...

Overview Simple AC Dimmer circuit for incandescent bulbs. 128 levels of brightness. Parts are relatively cheap!

0-10V Dimming Guide | Wiring, Installation & Dimmer

Learn how 0-10V dimming works for LED high bays, parking lot lights & commercial fixtures. Wiring diagrams, dimmer switch selection, installation steps &

2025 Ultimate Guide to 0-10V Dimming: Wiring, Working Principles ...

Explore the 2025 ultimate guide on 0-10V dimming systems. Learn about wiring, working principles, and common applications for commercial lighting control. Improve energy efficiency and

Dimming in Switched-mode LED Drivers

The SPI control interface sets the nominal running off-time digitally instead of using a resistor-capacitor circuit on the off-time control pin. TPS92518 has another register programmed through SPI to set the

AC Light Dimmer Circuit – Homemade Circuit Projects

Simple 220V, 120V AC Light Dimmer Switch Circuit The circuit diagram shown above is an classic example of a AC light dimmer, where a triac

How to Build an Isolated Digital AC Dimmer Using Arduino

How to Build an Isolated Digital AC Dimmer Using Arduino We always face the situations that we want to have full control (dimming) over an AC load such as a lamp, a motor, vacuum

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