

Control module with optocoupler relay



Overview

Relay Modules and Optocoupler Modules | WAGO From relay sockets to pluggable relay and optocoupler modules – WAGO delivers versatile, high-performance solutions.

Key Takeaways

A relay module with an optocoupler allows safe control of high-power devices from low-voltage circuits by providing electrical isolation between the control and load sides.

Overview
A relay module with an optocoupler integrates a standard electromechanical relay with an optical isolator. The optocoupler uses an internal LED and phototransistor to transmit signals without direct electrical contact, protecting the control circuit from voltage spikes, noise, and high currents. These modules are commonly used with microcontrollers like Arduino, ESP32, or ESP8266 to switch AC or DC loads safely.

Key Components

- Optocoupler (e.g., PC817, 4N35): Provides electrical isolation between the control signal and the relay coil.
- Relay (e.g., 5V or 12V coil): Switches the high-power load; can have single or multiple channels.
- Transistor (e.g., NPN 2N3904): Acts as a driver to supply sufficient current to the relay coil.
- Flyback diode (e.g., 1N4007): Protects the transistor and control circuit from voltage spikes generated when the relay coil turns off.

- Resistors: Limit current to the optocoupler LED and transistor base .
- Input pins (IN, VCC, GND): Connect to the microcontroller or control circuit to trigger the relay .

Working Principle

- A low-voltage control signal is applied to the module's input pin.
- The optocoupler LED lights up, activating the internal phototransistor.
- The phototransistor drives the transistor switch, which allows current to flow through the relay coil.
- The relay contacts switch the high-power load, while the control side remains electrically isolated .

Practical Considerations

- Ensure the relay coil resistance is compatible with the optocoupler and transistor to avoid overheating; typically, the coil should not draw more than 30–50 mA directly through the optocoupler .
- Use a flyback diode across the relay coil to prevent back EMF damage .
- Modules can be single-channel or multi-channel, allowing control of multiple devices from one microcontroller .
- Optocoupler relay modules are widely used in industrial automation, home automation, and microcontroller projects for safe switching of AC or DC loads .

Example Usage

- Arduino or ESP32: Connect the module's IN pin to a GPIO pin, VCC to 5V, and GND to ground. When the GPIO is set HIGH, the relay switches the connected load .
- High-power AC load: The relay contacts can switch mains voltage while the microcontroller remains isolated, preventing damage from voltage spikes . This combination of relay and optocoupler ensures both safety and reliable operation in projects requiring electrical isolation and high-current switching.

Article Content

Relay Modules and Optocoupler Modules | WAGO

From relay sockets to pluggable relay and optocoupler modules – WAGO delivers versatile, high-performance solutions for every

How to Connect a Relay through an Opto-Coupler

The following concepts show how a relay driver can be configured with an optocoupler using transistors. As shown in the following

Relay Module Optocoupler: Schematic and Working Explained

This article shares the Relay Module Optocoupler Schematic and Working principle.
Cheap DIY relay module project

How to Use Relay with optocoupler: Examples, Pinouts,

Learn how to use the Relay with optocoupler with detailed documentation, including pinouts, usage guides,

Amazon : Relay Module

ELEGOO 8 Channel DC 5V Relay Module with Optocoupler for Arduino Projects | Compatible with Arduino UNO R3 MEGA 1280

Relay Modules and Optocoupler Modules | WAGO

From relay sockets to pluggable relay and optocoupler modules – WAGO delivers versatile, high-performance solutions for every

Optocoupler + 12v automotive relay control circuit parts help and ...

The project: I am wanting to control an automotive relay from an Arduino Nano. The relays coil resistance is about

Onyehn 1 Channel DC 3V Relay High Level Driver Module Optocoupler Relay ...

Buy Onyehn 1 Channel DC 3V Relay High Level Driver Module Optocoupler Relay Module Isolated Drive Control Board for Arduino

6Pcs DC 3.3V Relay Module 1 Channel Optocoupler

Product Description Product name: Single-channel 3V high-level relay isolation control module (with

Relay Module Optocoupler: Schematic and Working Explained

This article shares the Relay Module Optocoupler Schematic and Working principle.
Cheap DIY relay module project

Relay and Optocoupler Modules | WAGO USA

Relay and Optocoupler Modules From sockets to pluggable relays to optocoupler modules, WAGO relays

Teyleten Robot DC 1 Channel Optocoupler 3V/3.3V

Product Summary: Teyleten Robot DC 1 Channel Optocoupler 3V/3.3V Relay High Level Driver Module

8 Channel DC 5V DC 230V Relay Module Control Board with

8 Channel DC 5V DC 230V Relay Module Control Board with Optocoupler for UNO R3
MEGA 2560 1280 DSP ARM PIC AVR TTL

1CH Active H/L 3V OptoCoupler Relay Module

It comes with 1 (single) channel 3.3V activation relay, ready to control 250VAC at
10A. Extra isolation with

Interface relays and optocouplers

Interface relays and optocouplers Enabling Power and Communication The ABB
interface relays and optocouplers portfolio offers a

6PCS 1 Channel DC 3V Relay High Level Driver Module Optocoupler Relay ...

Optocoupler Isolator - 3V/3.3V power relay module supports photocoupler isolation
control. Long Life - Fast response time less than

How Does It Work: DIY Relay Modules

How Does It Work: DIY Relay Modules: After looking through many instructables it's
clear that many makers love to use the pre

Relay Modules and Optocoupler Modules | WAGO

From relay sockets to pluggable relay and optocoupler modules – WAGO delivers
versatile, high-performance solutions for every

Optocoupler + 12v automotive relay control circuit parts help and ...

The project: I am wanting to control an automotive relay from an Arduino Nano. The
relays coil resistance is about

Onyehn 1 Channel DC 3V Relay High Level Driver Module Optocoupler Relay ...

Buy Onyehn 1 Channel DC 3V Relay High Level Driver Module Optocoupler Relay
Module Isolated Drive Control Board for Arduino

6Pcs DC 3.3V Relay Module 1 Channel Optocoupler

Product Description Product name: Single-channel 3V high-level relay isolation control
module (with

Relay Module Optocoupler: Schematic and Working Explained

This article shares the Relay Module Optocoupler Schematic and Working principle.
Cheap DIY relay module project

Relay and Optocoupler Modules | WAGO USA

Relay and Optocoupler Modules From sockets to pluggable relays to optocoupler modules, WAGO relays

How to Use One Channel Relay with Optocoupler: Pinouts, Specs,

The One Channel Relay with Optocoupler is an electronic switching device that allows a low-power control signal to operate a high

Relay and Optocoupler Modules

The 859 Series Relay Modules with miniature switching relays and optocoupler modules are ideal for

Optocoupler Isolation in Relay Modules: the Key to Protecting Your ...

The Future of Optocoupler Isolation in Relay Modules As technology continues to advance, the role of optocoupler

The Basics of Optocoupler Relay

So what is an Optocoupler Relay? A relay operating on the principle of opto-isolation, i.e.

Teyleten Robot DC 1 Channel Optocoupler 3V/3.3V Relay High

Product Summary: Teyleten Robot DC 1 Channel Optocoupler 3V/3.3V Relay High Level Driver Module Isolated Drive Control Board

8 Channel DC 5V DC 230V Relay Module Control Board with

8 Channel DC 5V DC 230V Relay Module Control Board with Optocoupler for UNO R3 MEGA 2560 1280 DSP ARM PIC AVR TTL

1CH Active H/L 3V OptoCoupler Relay Module

It comes with 1 (single) channel 3.3V activation relay, ready to control 250VAC at 10A. Extra isolation with optocoupler at the front of

Interface relays and optocouplers

Interface relays and optocouplers Enabling Power and Communication The ABB interface relays and optocouplers portfolio offers a

Relay Modules and Optocoupler Modules | WAGO

From relay sockets to pluggable relay and optocoupler modules – WAGO delivers versatile, high-performance solutions for every

How to Connect a Relay through an Opto-Coupler

The following concepts show how a relay driver can be configured with an optocoupler using transistors. As shown in the following

Relay Module Optocoupler: Schematic and Working Explained

This article shares the Relay Module Optocoupler Schematic and Working principle. Cheap DIY relay module project

How to Use Relay with optocoupler: Examples, Pinouts,

Learn how to use the Relay with optocoupler with detailed documentation, including pinouts, usage guides,

Amazon : Relay Module

ELEGOO 8 Channel DC 5V Relay Module with Optocoupler for Arduino Projects | Compatible with Arduino UNO R3 MEGA 1280

6Pcs DC 3.3V Relay Module 1 Channel Optocoupler

It is essentially an "automatic switch" that uses a smaller current to control a larger current. It is used to

Relay and Optocoupler Modules | WAGO USA

WAGO's 859 Series Relay Modules with a Miniature Switching Relay and Optocoupler Modules are ideal

User's Guide: 12V 4-Channel Relay Module with Optocoupler

This module allows microcontrollers to control high-voltage devices (AC or DC) using opto-isolated relays. Each

5V 1-Channel Low-Level Relay Module with Optocoupler Product ...

This relay module allows microcontrollers to control high-voltage devices (up to 250VAC or 30VDC, 10A) using a low

How to Use 1 Channel Relay module with Optocoupler: Examples,

Learn how to use the 1 Channel Relay module with Optocoupler with detailed documentation, including pinouts, usage guides, and

Relay Modules and Optocoupler Modules | WAGO

From relay sockets to pluggable relay and optocoupler modules – WAGO delivers versatile, high-performance solutions for every

How to Connect a Relay through an Opto-Coupler

The following concepts show how a relay driver can be configured with an optocoupler using transistors. As shown in the following

Relay Module Optocoupler: Schematic and Working Explained

This article shares the Relay Module Optocoupler Schematic and Working principle. Cheap DIY relay module project

How to Use Relay with optocoupler: Examples, Pinouts,

Learn how to use the Relay with optocoupler with detailed documentation, including pinouts, usage guides,

Amazon : Relay Module

ELEGOO 8 Channel DC 5V Relay Module with Optocoupler for Arduino Projects | Compatible with Arduino UNO R3 MEGA 1280

6Pcs DC 3.3V Relay Module 1 Channel Optocoupler

It is essentially an "automatic switch" that uses a smaller current to control a larger current. It is used to

Relay and Optocoupler Modules | WAGO USA

WAGO's 859 Series Relay Modules with a Miniature Switching Relay and Optocoupler Modules are ideal

User's Guide: 12V 4-Channel Relay Module with Optocoupler

This module allows microcontrollers to control high-voltage devices (AC or DC) using opto-isolated relays. Each

5V 1-Channel Low-Level Relay Module with Optocoupler Product ...

This relay module allows microcontrollers to control high-voltage devices (up to 250VAC or 30VDC, 10A) using a low

How to Use 1 Channel Relay module with Optocoupler: Examples,

Learn how to use the 1 Channel Relay module with Optocoupler with detailed documentation, including pinouts, usage guides, and

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

Contact Us

Continue your research online:

Website: <https://jewelbluimages.co.za>

Technical inquiry: <https://jewelbluimages.co.za/contact.html>

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

