

Principle of a 1-channel optocoupler relay module

Article Overview

A 1-channel optocoupler relay module allows a low-voltage control signal to safely switch a high-voltage load by using an optocoupler for electrical isolation and a transistor to drive the relay coil.

Working Principle

The module operates by electrically isolating the control side (microcontroller) from the high-voltage load side using an optocoupler, typically a PC817 IC. When a control signal is applied to the input pin, it powers the internal LED of the optocoupler, which emits light that activates the phototransistor inside the optocoupler. This phototransistor then drives a transistor switch (e.g., 2N3904) that allows sufficient current to flow through the relay coil, energizing it and closing or opening the relay contacts to control the connected load .

Key Components and Their Roles

- **Optocoupler (PC817):** Provides electrical isolation between the low-voltage control circuit and the high-voltage relay circuit, protecting sensitive electronics from voltage spikes and noise .
- **Transistor (NPN, e.g., 2N3904):** Acts as a current amplifier to drive the relay coil, which requires more current than a microcontroller can supply directly .
- **Relay Coil:** Electromechanical switch that opens or closes contacts to control the high-power load

Article Content

Jun 09, 2026

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 circuit diagrams, the relay driver may consist a NPN transistor or a PNP

May 21, 2026

5V 1-Channel Optical Relay Module Guide | PDF | Relay | Switch

This document provides information about a 1-channel 5V optical isolated relay module. It can control appliances and equipment with large currents under AC 250V 10A or DC 30V 10A.

Sep 10, 2025

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

The 1 Channel Relay Module with Optocoupler (Manufacturer Part ID: SRD-05VDC-SL-C) is a versatile electronic component designed to control high-voltage devices using low-voltage signals.

Apr 22, 2026

Relay Module Optocoupler: Schematic and Working Explained

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

May 25, 2026

5V Single Channel Relay Module

In this tutorial, we will discuss 5V single channel relay modules and their important features such as pinout, pin configuration details, features, working, interfacing with microcontrollers and applications.

Jul 10, 2026

Handson Technology

1-Channel 5V Optical Isolated Relay Module This is a Lo/Hi Level 5V (user configurable) 1-channel relay interface board, and each channel needs a 15-20mA driver current. It can be used to control various

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5V 1 Channel Level Trigger Optocoupler Relay Module For Arduino

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Single Channel Relay Module : Datasheet & Its Working

The 5V single-channel relay module includes different components like a relay, status LED, an output terminal, power LED, freewheeling diode, switching transistor, and input connector

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5V Single-Channel Relay Module

The single-channel relay module is much more than just a plain relay, it contains components that make switching and connection easier and act

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User''s Guide: 12V 1-Channel Relay Module (High/Low Trigger,

This module allows microcontrollers to safely control high-voltage devices using a relay with optocoupler isolation. It supports both HIGH and LOW level triggering, selectable via jumper,

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5V 1-Channel Optical Relay Module Guide

This document provides information about a 1-channel 5V optical isolated relay module. It can control appliances and equipment with large currents under AC 250V 10A or DC 30V 10A. The module has a

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DC 5V Relay Module 1-Channel Relay Switch with Optocoupler

About this item □Control Devices□The 1-channel relay module uses genuine high quality DC5V relay and SMD opto-isolator supporting high/low level trigger, widely apply to control various AC/DC

Mar 03, 2026

How to Connect a Relay through an Opto-Coupler

In the following post I have explained how to drive a relay by using an isolated method, or through an optocoupler device. We will learn three methods, first method is by connecting relay directly with the

Sep 02, 2025

12V 8-Channel Relay Module with Optocoupler – Support

The 12V 8-Channel Relay Module with Optocoupler is designed to control multiple high-voltage devices using low-voltage signals from microcontrollers like Arduino, Raspberry Pi, and

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How Optocouplers Work

FREE COURSE!! Learn about optocouplers. We'll look at how they are used to control circuits, how they work and also how to design some simple optocoupler circuits to show the working

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Arduino Tutorial: 2-Channel Optocoupler Relay Module

High-quality Sngle relay featuring a single pole double throw (SPDT) configuration, with one common terminal, one normally open terminal, and one normally closed terminal. Optocoupler isolation for

Mar 23, 2026

How to Use 1 Channel Relay Module, 30A with Optocoupler, Isolation

The 1 Channel Relay Module is a versatile electronic component designed to control high-power devices such as motors, lights, and appliances. It features a 30A relay, optocoupler isolation for enhanced

Nov 01, 2025

How a Relay Module Works and Interfacing a Single Channel Relay Module ...

This article will explore the workings of a relay module and provide a detailed guide on how to interface a single channel relay module with an Arduino.

Jul 27, 2025

Handson Technology

This is a Lo/Hi Level 5V (user configurable) 1-channel relay interface board, and each channel needs a 15-20mA driver current. It can be used to control various appliances and equipment with large current.

May 10, 2026

Opto-isolator

Schematic diagram of an opto-isolator showing source of light (LED) on the left, dielectric barrier in the center, and sensor (phototransistor) on the right [note 1] An opto-isolator (also called an optocoupler,

Jul 24, 2026

Schematic, Amazon Relay Module: 1 Channel, Optocoupler ...

This schematic was created from tracing out the circuitry of the 12 V version of the module, but it is probably applicable to the other voltage versions of the same module (e.g. the 5V

Jun 29, 2026

In-Depth: Interface One Channel Relay Module with Arduino

In this tutorial, we'll show you how to hook up a one-channel relay module to your Arduino and use it to turn on and off devices like a lamp or motor. But before we dive into wiring and

Jun 14, 2026

ADIY 1 CHANNEL 12V RELAY BOARD WITH OPTO

12V 1-Channel Relay Module with Optocoupler by ADIY is a Bidirectional isolation type 1-Channel relay control module, according to user needs, you can choose a high or low level to control the relay pull.

May 26, 2026

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

Overview This relay module allows microcontrollers to control high-voltage devices (up to 250VAC or 30VDC, 10A) using a low-voltage signal. The optocoupler provides electrical isolation

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5V 1-Channel Relay Module with Optocoupler & Level

Buy 5V one-channel isolated relay module with an optocoupler. Supports high & low-level triggers for Arduino, Raspberry Pi, and automation projects.

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How to Use 1 Channel Relay module with Optocoupler:

Learn how to use the 1 Channel Relay module with Optocoupler with detailed

Aug 19, 2025

1CH Active H/L 5V OptoCoupler Relay Module

This is a 1 (single) channel universal 5V relay module because it can be be configured as high or low triggered (Logic High or Low). With each relay rated at 250VAC, 10A, and breakout to screw

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5V 1 Channel Relay Module with Opto Coupler – Tomson Electronics

Buy the 5V Single Channel with Optocoupler Relay Module for Arduino and other microcontroller projects. Compact, efficient, and ideal for switching high-power devices.

Jan 13, 2026

5V 1 Channel Relay Module With Optocoupler –

The 5V 1 Channel Relay Module provides reliable switching with a 5V input voltage and a maximum current rating of 10A. It features a 1 channel relay module with

Oct 27, 2025

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

Learn how to use the One Channel Relay with Optocoupler with detailed documentation, including pinouts, usage guides, and example projects. Perfect for students, hobbyists, and developers

May 18, 2026

How to Use 5V 30A 1

The 5V 30A 1-Channel Relay Module manufactured by SONGLE (Part ID: RELAY MODULE) is a versatile electronic component designed to control high-voltage devices using low-voltage signals. It

Jan 29, 2026

5V Single Channel Relay Module

5V Single Channel Relay Module PinoutHow to Use 5V Single Channel Relay Module?Control 5V Single-Channel Relay Module with MicrocontrollerApplicationsLet's first discuss the pinout and pin configuration details of the 5V single channel relay module. The following diagram shows its pinout diagram. It is known as a single channel because only one relay is used and it operates on 5V.See more on microcontrollerslab cirkitdesigner

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 example projects. Perfect for students, hobbyists, and developers

Contact Us

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