Walfront Walfrontkc8b0o4p9e-02

Walfront 4 Channel Relay Module Board 12V User Manual

Model: Walfrontkc8b0o4p9e-02

1. Product Overview

The Walfront 4 Channel Relay Module Board is a versatile electronic component designed to control high-power devices using low-voltage signals. It features photocoupler isolation for enhanced safety and stable performance, protecting your control circuit from the load circuit. This 12V version is suitable for various applications requiring switching capabilities.

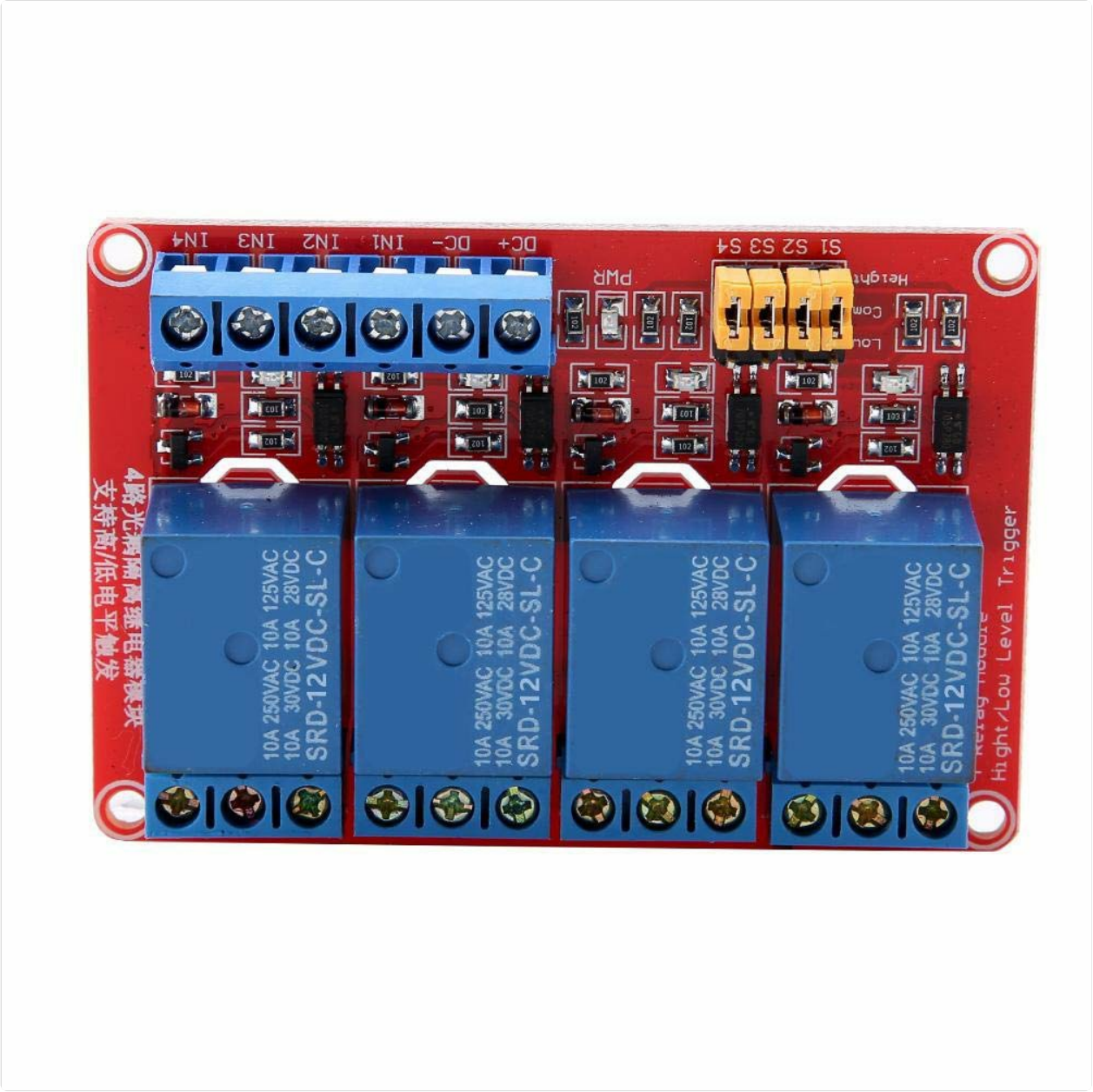

Figure 1: Top view of the Walfront 4 Channel Relay Module Board.

The module incorporates a fault-tolerant design, ensuring that the relay remains in its current state even if the control line is accidentally disconnected. It provides clear visual feedback with a green power indicator light and red indicator lights for each of the four relays, showing their operational status.

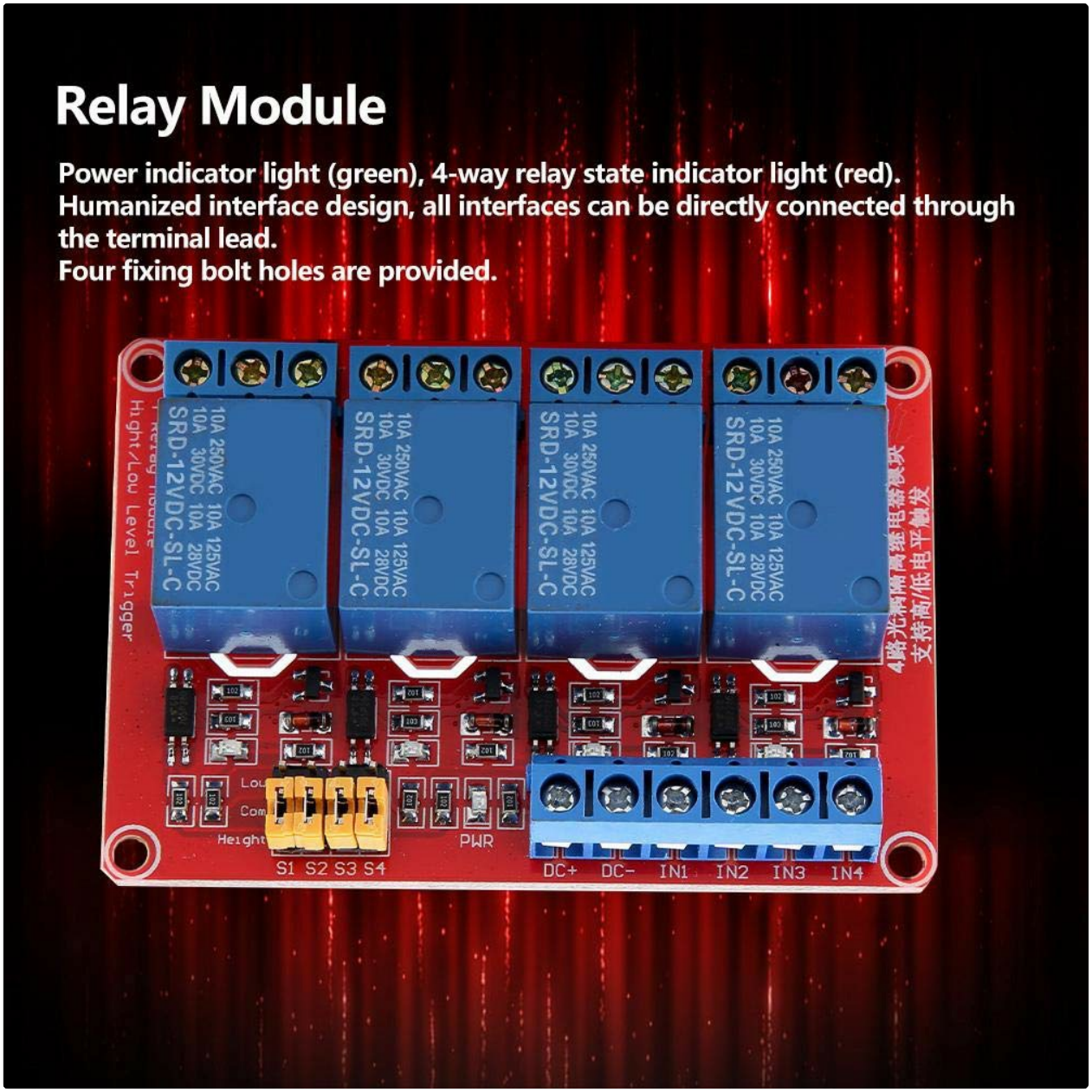

Figure 2: Walfront Relay Module highlighting power and relay state indicator lights, and terminal connections.

2. Features

- **Photocoupler Isolation:** Utilizes patch photocoupler isolation for strong driving ability and stable performance, with a current of 5mA.
- **Multiple Voltage Options:** Available in 5V, 12V, and 24V operating voltages (this specific model is 12V).
- **High & Low Level Trigger:** Each relay can be triggered by either a high-level or low-level signal, configurable via jumper settings.
- **Fault-Tolerant Design:** Prevents unintended relay activation even if the control line breaks.
- **User-Friendly Interfaces:** All interfaces are designed for direct connection via terminal blocks, ensuring convenient wiring.
- **Visual Indicators:** Features a green power indicator light and individual red indicator lights for each of the four relays.
- **Mounting Holes:** Four fixing holes are provided for secure installation.

3. Specifications

Feature	Specification
Model	Walfrontkc8b0o4p9e-02
Operating Voltage	12V DC
Number of Channels	4
Isolation Type	Photocoupler Isolation
Trigger Current	5mA
Trigger Level	High or Low (Jumper Selectable)
Common Interface Load (AC)	250V/10A
Common Interface Load (DC)	30V/10A
Module Size (L*W*H)	73*50*18.5mm / 2.9*2*0.7inch
Fixing Hole Diameter	3.1 mm
Item Weight	60 g
Mounting Type	Board Mount
Contact Material	Silver or Gold
Contact Type	Normally Closed (NC)

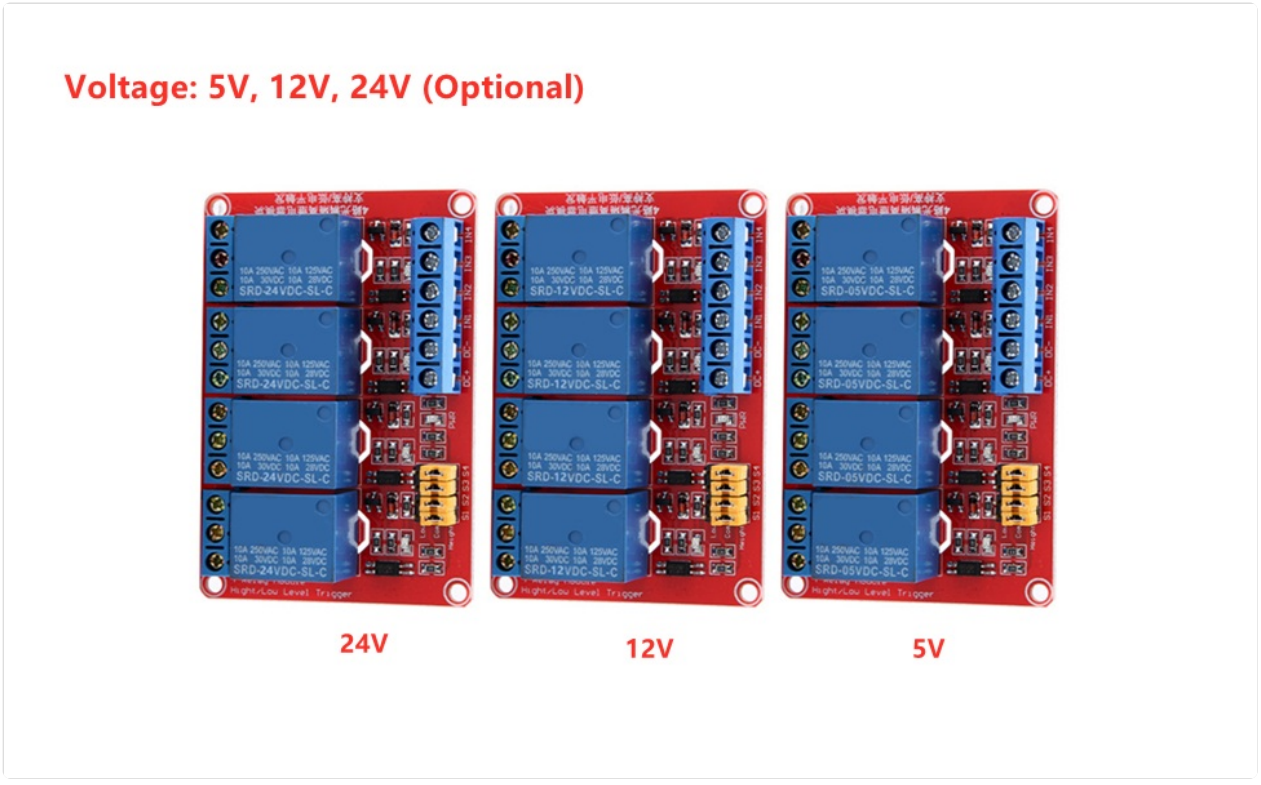

Figure 3: The Walfront 4 Channel Relay Module is available in 5V, 12V, and 24V versions. This manual pertains to the 12V model.

4. Setup and Wiring

Proper setup and wiring are crucial for the safe and correct operation of the relay module. Always ensure power is disconnected before making any connections.

4.1 Module Layout

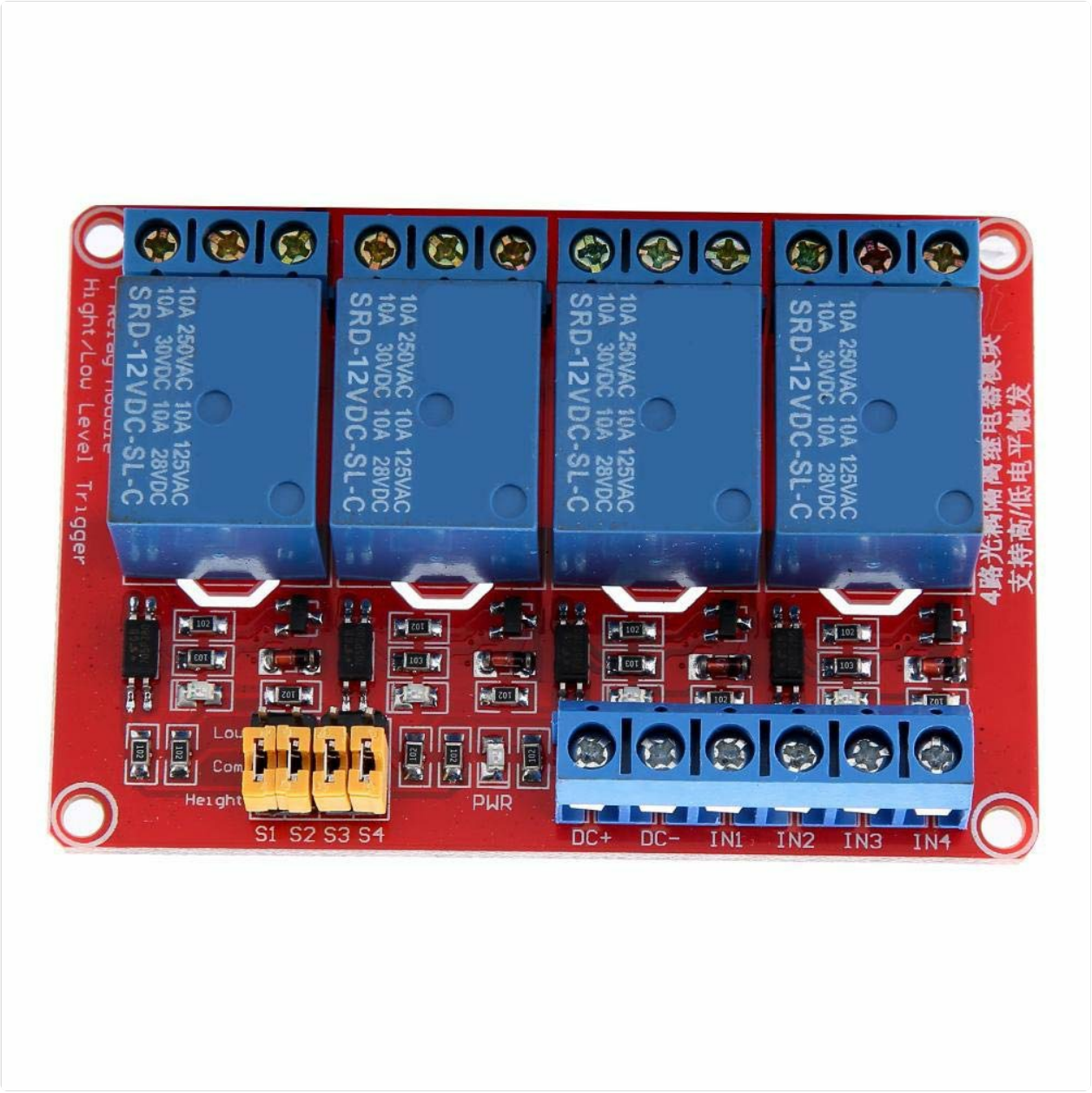

Figure 4: Detailed top view of the relay module showing power, input, and output terminals.

4.2 Power Supply Connection

Connect a 12V DC power supply to the module's power input terminals:

- **DC+:** Connect to the positive (+) terminal of your 12V DC power supply.
- **DC-:** Connect to the negative (-) terminal of your 12V DC power supply.

The green power indicator LED will illuminate when power is correctly applied.

4.3 Input Signal Connection

Connect your control signals (e.g., from a microcontroller like Arduino, Raspberry Pi) to the input terminals:

- **IN1, IN2, IN3, IN4:** These are the control input pins for each of the four relays. Connect your digital output pins from your control device to these inputs.

4.4 Load Connection (Relay Output)

Each relay has three terminals for connecting your load:

- **NO (Normally Open):** This terminal is open (disconnected) when the relay is de-energized and closes (connects to COM) when the relay is energized.
- **COM (Common):** This is the common terminal. Connect one side of your load's power source here.
- **NC (Normally Closed):** This terminal is closed (connected to COM) when the relay is de-energized and opens (disconnects from COM) when the relay is energized.

Choose between NO and NC depending on whether you want the load to be ON or OFF by default when the relay is not triggered.

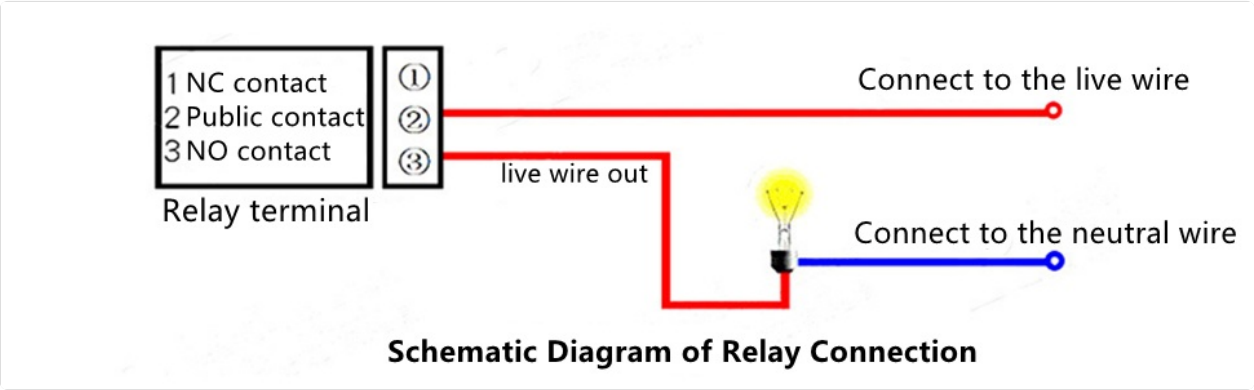

Figure 5: Example schematic for connecting a load to a relay terminal.

4.5 Jumper Settings for Trigger Level (S1-S4)

The module allows you to select the trigger level for each relay independently using jumpers S1, S2, S3, and S4. Each jumper corresponds to one relay (S1 for IN1, S2 for IN2, etc.).

- **LOW (L):** When the jumper is placed on the 'LOW' side, the relay will activate when the corresponding input pin (INx) receives a low-level signal (0V or ground).
- **HIGH (H):** When the jumper is placed on the 'HIGH' side, the relay will activate when the corresponding input pin (INx) receives a high-level signal (e.g., 5V for a 5V logic system).

Ensure the jumper settings match the logic level of your control device's output signals.

5. Operating Instructions

Once the module is correctly wired and powered, you can control the relays by sending appropriate signals to the IN1-IN4 pins.

- **Relay Activation:** When an input pin (INx) receives the configured trigger signal (high or low, as set by the jumper), the corresponding relay will energize. The red indicator light for that relay will illuminate.
- **Load Switching:** Upon activation, the relay's internal switch will change state: NO will connect to COM, and NC will disconnect from COM. This will switch your connected load ON or OFF.
- **Relay Deactivation:** When the input pin (INx) receives the opposite signal (or no signal, depending on your control circuit), the relay will de-energize. The red indicator light will turn off, and the relay contacts will return to their default (Normally Closed/Normally Open) state.

For example, if a jumper is set to 'HIGH' for IN1, sending a 5V signal to IN1 will activate Relay 1. If it's set to 'LOW', sending a 0V signal will activate Relay 1.

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Video 1: A demonstration of a 4-channel relay module in operation, showing the switching action.

6. Maintenance

The Walfront 4 Channel Relay Module is designed for durability and requires minimal maintenance. Follow these guidelines to ensure its longevity:

- **Keep Dry:** Protect the module from moisture and humidity to prevent corrosion and short circuits.
- **Cleanliness:** Keep the board free from dust and debris. Use a soft, dry brush or compressed air for cleaning if necessary. Avoid using liquid cleaners.
- **Temperature:** Operate the module within its specified temperature range. Avoid extreme heat or cold.
- **Physical Damage:** Handle the module with care to prevent physical damage to components or solder joints.
- **Power Off Before Adjustments:** Always disconnect power before making any wiring changes or adjusting jumpers.

7. Troubleshooting

If you encounter issues with your relay module, consider the following troubleshooting steps:

- **Module Not Powering On:**
  - Check if the 12V DC power supply is correctly connected to DC+ and DC-.
  - Verify that the power supply is providing the correct voltage (12V) and sufficient current.
  - Ensure the power indicator (green LED) is illuminated.
- **Relay Not Activating:**
  - Confirm that the input signal (INx) from your control device is correctly connected.
  - Check the jumper setting (S1-S4) for the corresponding relay. Ensure it matches the logic level of your control signal (HIGH for high-level trigger, LOW for low-level trigger).
  - Verify that your control device is actually sending the correct trigger signal. Use a multimeter to check the voltage at the INx pin.
  - Note: Some 3.3V microcontrollers may not reliably drive the relay when set to active-LOW if the module expects a true 0V for low. Ensure your control signal is strong enough.
  - Check if the red indicator LED for the specific relay illuminates when the trigger signal is applied.
- **Load Not Switching:**
  - Ensure the load is correctly wired to the COM and either NO or NC terminals.
  - Verify that the load itself is functional and its power source is connected.
  - Check if the load's current and voltage requirements are within the relay's specifications (AC 250V/10A, DC 30V/10A). Overloading can damage the relay.
- **Intermittent Operation:**
  - Inspect all wiring for loose connections.
  - Ensure the power supply is stable and free from voltage fluctuations.

8. Warranty and Support

Walfront products are manufactured to high-quality standards. For any technical assistance or support inquiries, please refer to the retailer or contact Walfront customer service through their official channels. Please retain your proof of purchase for warranty claims.