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KNACRO 2-Channel Relay Module

KNACRO 2-Channel Relay Module User Manual

High/Low Level Trigger, Optocoupler Isolation, 30A Load

1. Product Overview

The KNACRO 2-Channel Relay Module is a versatile control unit designed for various automation and control applications. It features two independent high-power relays, each capable of switching loads up to DC 30V 30A or AC 250V 30A. The module incorporates optocoupler isolation for enhanced anti-interference capabilities, ensuring reliable operation by separating the control circuit from the load circuit. Each channel includes an LED indicator to show the relay's status.
This module is suitable for PLC automation equipment control, industrial system control, logistics network control, smart home product integration, and experimental development for electronic enthusiasts.

2. Key Features

- **High-Power Relays:** Equipped with two high-power relays, each supporting a maximum control load of DC 30V 30A or AC 250V 30A.
- **Optocoupler Isolation:** Each channel features optocoupler isolation, providing strong anti-interference ability and ensuring safety by separating control and load circuits.
- **Safety Standards:** Designed with an isolation slot between the control area and the load area, adhering to international safety standards.
- **LED Indicators:** Each relay channel includes an LED indicator to visually confirm its operational status.
- **Wide Application:** Ideal for PLC automation, industrial control systems, logistics networks, smart home devices, and various electronic development projects.
- **Flexible Triggering:** Supports both high-level and low-level trigger modes, adaptable to different control signals.

3. Technical Specifications

Parameter	Value
Supply Voltage	DC 24V
Quiescent Current	5mA
Maximum Operating Current	190mA
Trigger Mode	High and Low Level Trigger
Load Voltage (Max)	DC 30V / AC 250V
Load Current (Max)	30A
Relay Life	> 100,000 times
Dimensions (L*W*H)	70 * 72 * 22mm
Weight	93g
Coil Voltage	24 volts

Trigger Voltage Ranges (for 24V module):

- **Low-level trigger:** 0-12V relay ON; 12-24V relay OFF.
- **High-level trigger:** 12-24V relay ON; 0-8.5V relay OFF.

4. Setup and Wiring

Proper wiring is crucial for the safe and correct operation of the relay module. Refer to the diagrams and instructions below for connecting the power supply, control signals, and load.

4.1 Module Layout

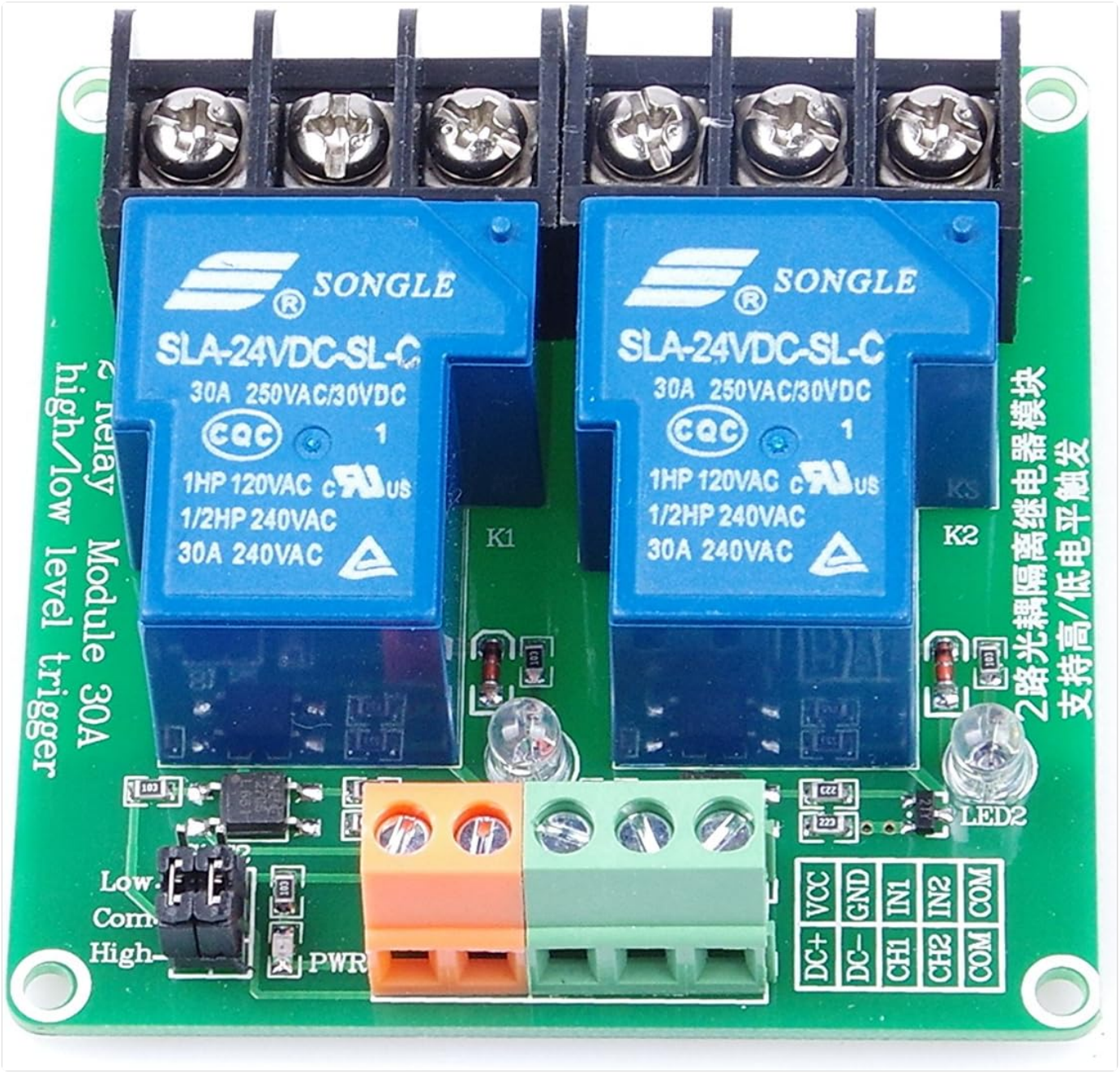


Figure 4.1: Top view of the KNACRO 2-Channel Relay Module. This image displays the two blue Songle relays, the input terminal block (DC+, GND, VCC, IN1, IN2, COM), and the output terminal blocks for the load connections (NO, NC, COM for each relay).

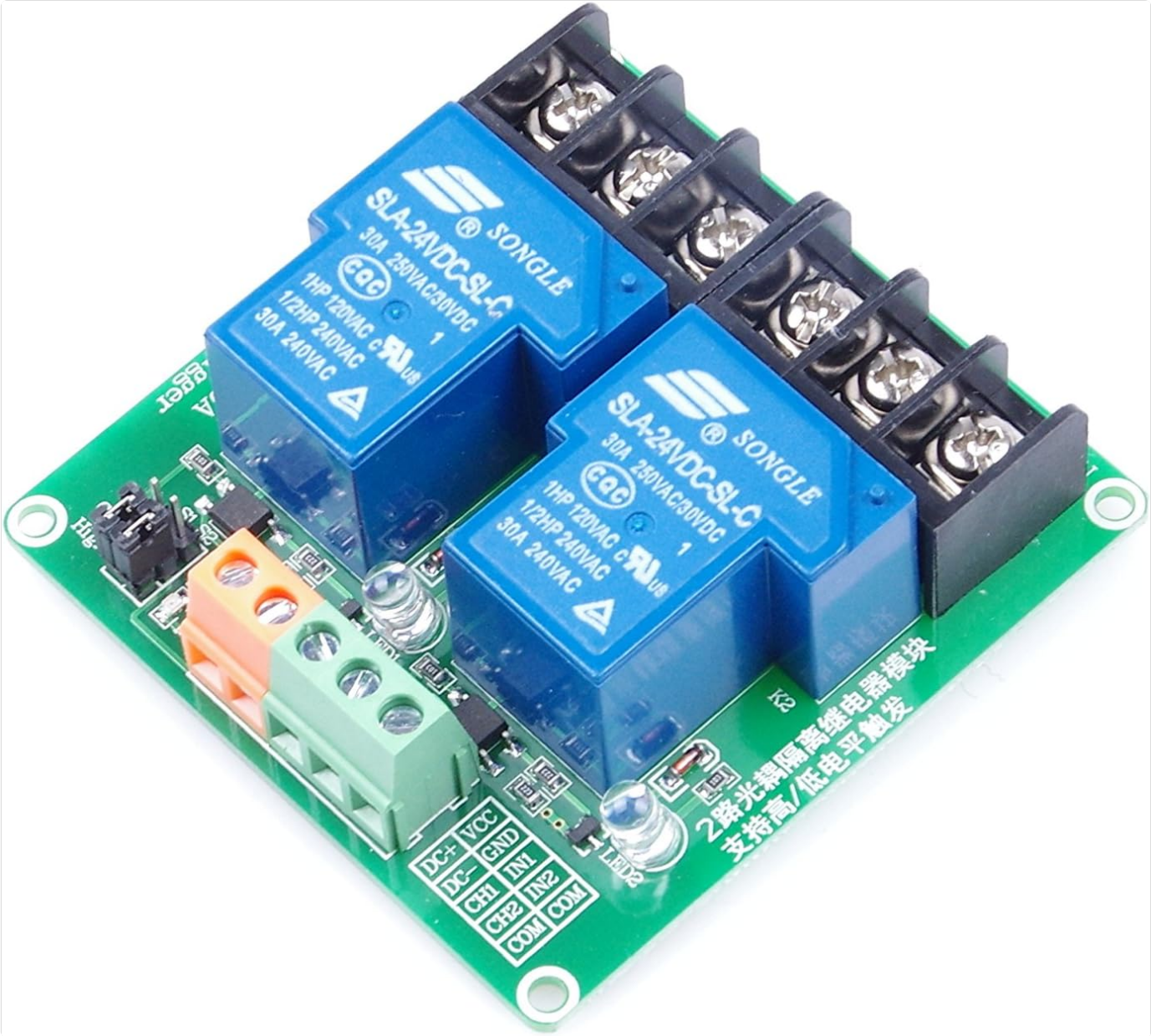


Figure 4.2: Angled view of the relay module, highlighting the input and output terminal blocks. The input block includes connections for power (DC+, GND, VCC) and control signals (IN1, IN2, COM), while the output blocks provide Normally Open (NO), Normally Closed (NC), and Common (COM) terminals for each relay.

4.2 Power Supply Connection

- Connect the positive terminal of your DC 24V power supply to the **DC+** terminal on the module.
- Connect the negative terminal (ground) of your DC 24V power supply to the **GND** terminal on the module.
- The **VCC** terminal is typically connected to DC+ for the module's internal power, but can be isolated for specific applications. For standard use, connect **VCC** to **DC+**.
- Ensure the power supply voltage matches the module's rated voltage (DC 24V for this model).

4.3 Control Signal Connection

The module supports both high-level and low-level triggering. The trigger mode is selected via a jumper on the module (labeled "Low" and "High").

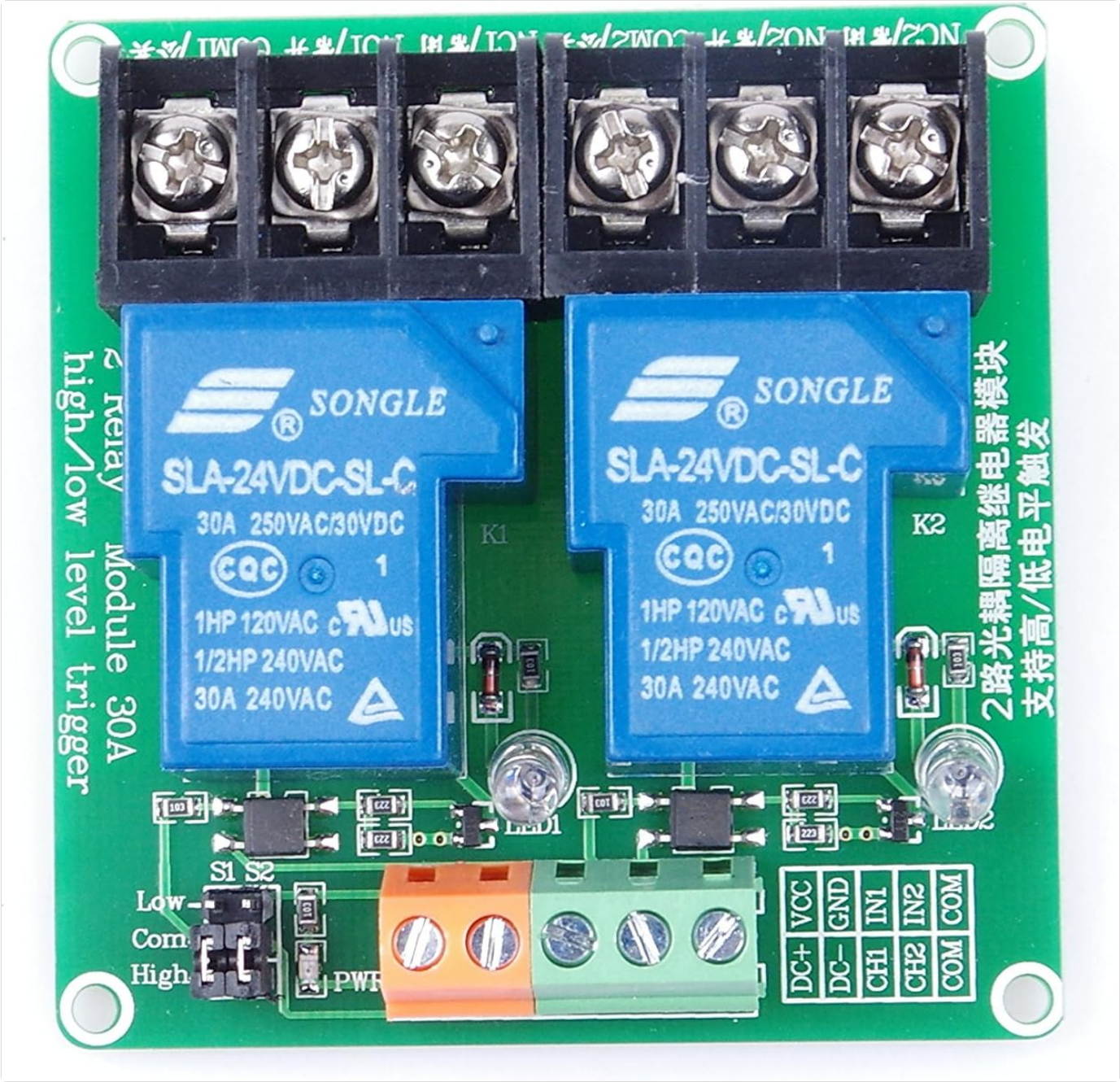


Figure 4.3: Close-up view of the jumper settings for selecting high or low-level trigger mode. The jumper connects the signal input (IN1, IN2) to either the "Low" or "High" pin, determining the active state of the control signal.

- Connect your control signal source (e.g., Arduino, PLC output) to the**IN1** and **IN2** terminals for Relay 1 and Relay 2, respectively.
- Connect the ground of your control signal source to the**COM** terminal on the module's input side.
- **Jumper Setting:**
  - **Low-Level Trigger:** Position the jumper to connect the signal pin to the "Low" pin. The relay will activate when the input signal (IN1/IN2) is between 0-12V.
  - **High-Level Trigger:** Position the jumper to connect the signal pin to the "High" pin. The relay will activate when the input signal (IN1/IN2) is between 12-24V.

4.4 Load Connection

Each relay provides three terminals for load connection: Normally Open (NO), Normally Closed (NC), and Common (COM).

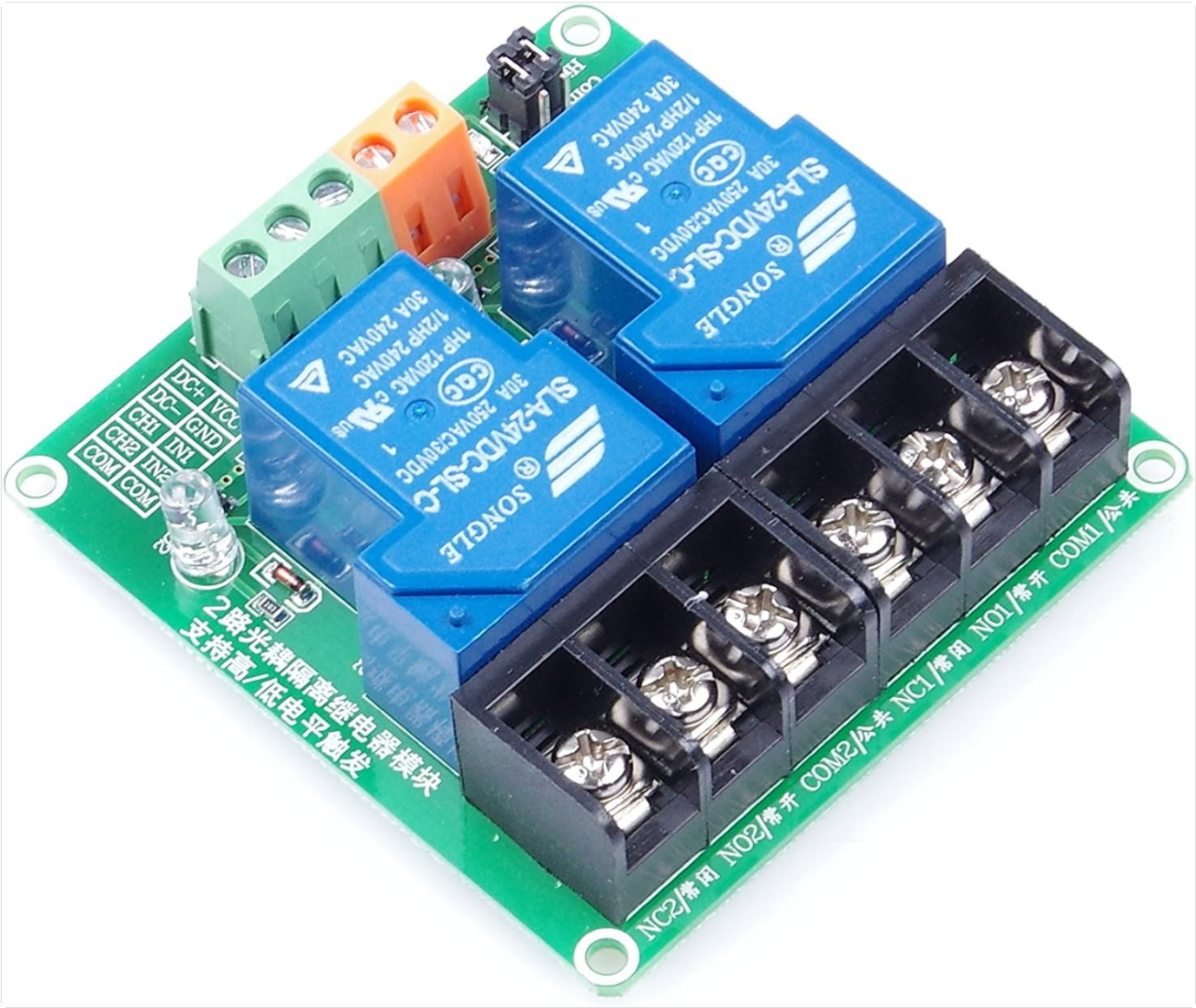


Figure 4.4: Angled view of the relay module, focusing on the output terminal blocks. Each relay has three terminals: Normally Open (NO), Normally Closed (NC), and Common (COM), allowing for flexible load control configurations.

- **Common (COM):** This is the central terminal for the load circuit. Connect one side of your load's power source (or the load itself) to this terminal.
- **Normally Open (NO):** When the relay is OFF (not activated), there is no connection between COM and NO. When the relay is ON (activated), COM and NO are connected, completing the circuit.
- **Normally Closed (NC):** When the relay is OFF (not activated), COM and NC are connected. When the relay is ON (activated), the connection between COM and NC is broken.
- Connect your load according to your desired operation (e.g., for a load to turn ON when the relay activates, connect it between COM and NO).
- Ensure the load's voltage and current do not exceed the relay's maximum ratings (DC 30V 30A / AC 250V 30A).

5. Operation

Once the module is correctly wired and powered, its operation is determined by the control signals applied to the IN1 and IN2 terminals, in conjunction with the selected trigger mode.

5.1 Relay Activation

- When a control signal matching the selected trigger mode (high or low level) is applied to IN1 or IN2, the corresponding relay will activate.
- Upon activation, the LED indicator for that channel will illuminate.
- The internal contacts of the relay will switch: the connection between COM and NC will open, and the connection between COM and NO will close.

5.2 Relay Deactivation

- When the control signal is removed or changes to the inactive state (opposite of the trigger mode), the relay will deactivate.
- The LED indicator for that channel will turn off.
- The internal contacts will return to their default state: COM and NC will reconnect, and COM and NO will open.

Each relay operates independently, allowing for separate control of two distinct loads.

6. Maintenance

The KNACRO 2-Channel Relay Module is designed for reliable operation with minimal maintenance. Adhering to the following guidelines will help ensure its longevity:

- **Cleanliness:** Keep the module free from dust, dirt, and moisture. Use a soft, dry cloth for cleaning. Avoid using liquids or abrasive cleaners.
- **Environmental Conditions:** Operate the module within its specified temperature and humidity ranges. Avoid extreme temperatures or high humidity environments.
- **Connection Integrity:** Periodically check all wiring connections to ensure they are secure and free from corrosion. Loose connections can lead to intermittent operation or damage.
- **Load Management:** Do not exceed the maximum specified load voltage and current for the relays. Overloading can significantly reduce relay life and cause damage.
- **Physical Handling:** Handle the module with care to avoid physical damage to components or solder joints.

7. Troubleshooting

If you encounter issues with your KNACRO 2-Channel Relay Module, refer to the following common problems and solutions:

Problem	Possible Cause & Solution

Problem	Possible Cause & Solution
Relay does not activate (LED off)	◦ **No power to module:** Check DC+ and GND connections. Ensure power supply is ON and providing the correct voltage (24V). ◦ **Incorrect control signal:** Verify the control signal (IN1/IN2) is being sent correctly from your controller (e.g., Arduino, PLC). ◦ **Incorrect trigger mode:** Check the high/low level trigger jumper setting. Ensure it matches your control signal's active state. ◦ **Control signal voltage mismatch:** Ensure the control signal voltage falls within the specified trigger range for the selected mode (e.g., for 24V module, low-level trigger 0-12V, high-level trigger 12-24V). ◦ **Loose connections:** Inspect all input wiring for secure connections.
Relay activates but load does not turn ON/OFF	◦ **Incorrect load wiring:** Verify the load is correctly connected to the COM and NO/NC terminals as desired. ◦ **Load power issue:** Check the power supply to the load itself. Ensure the load is receiving power and is functional. ◦ **Overloaded relay:** The load's current or voltage may exceed the relay's maximum rating (30A, DC 30V / AC 250V). Reduce the load or use a higher-rated relay. ◦ **Damaged relay contacts:** If the relay clicks and LED illuminates but the load never switches, the internal contacts might be damaged.
Module powers ON but relays chatter or behave erratically	◦ **Unstable power supply:** Ensure the 24V power supply is stable and free from voltage fluctuations. ◦ **Noise on control lines:** Electrical noise can cause false triggers. Use shielded cables or add filtering if necessary. ◦ **Grounding issues:** Ensure proper common ground connections between the module, power supply, and control source.

8. Warranty and Support

KNACRO products are manufactured to high-quality standards. For specific warranty information, please refer to the documentation provided with your purchase or contact your retailer. If you encounter any issues or require technical assistance, please reach out to KNACRO customer support through the platform where the product was purchased. We value your feedback and are committed to providing excellent customer service.

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Model: 2-Channel Relay Module (DC 24V)

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