

Coliao B0DLG9J81H

Coliao 4-Channel IIC I2C Logic Level Converter User Manual

Bi-Directional 3.3V-5V Shifter Module

1. INTRODUCTION

The Coliao 4-Channel IIC I2C Logic Level Converter is a bi-directional voltage shifter module designed to safely interface devices operating at different voltage levels, typically 3.3V and 5V. This module is essential for connecting modern 3.3V microcontrollers (like Raspberry Pi, ESP32, Arduino Due) with 5V peripherals, or vice-versa, without causing damage due to voltage incompatibility. Each module comes pre-soldered with headers for ease of use, eliminating the need for manual soldering.

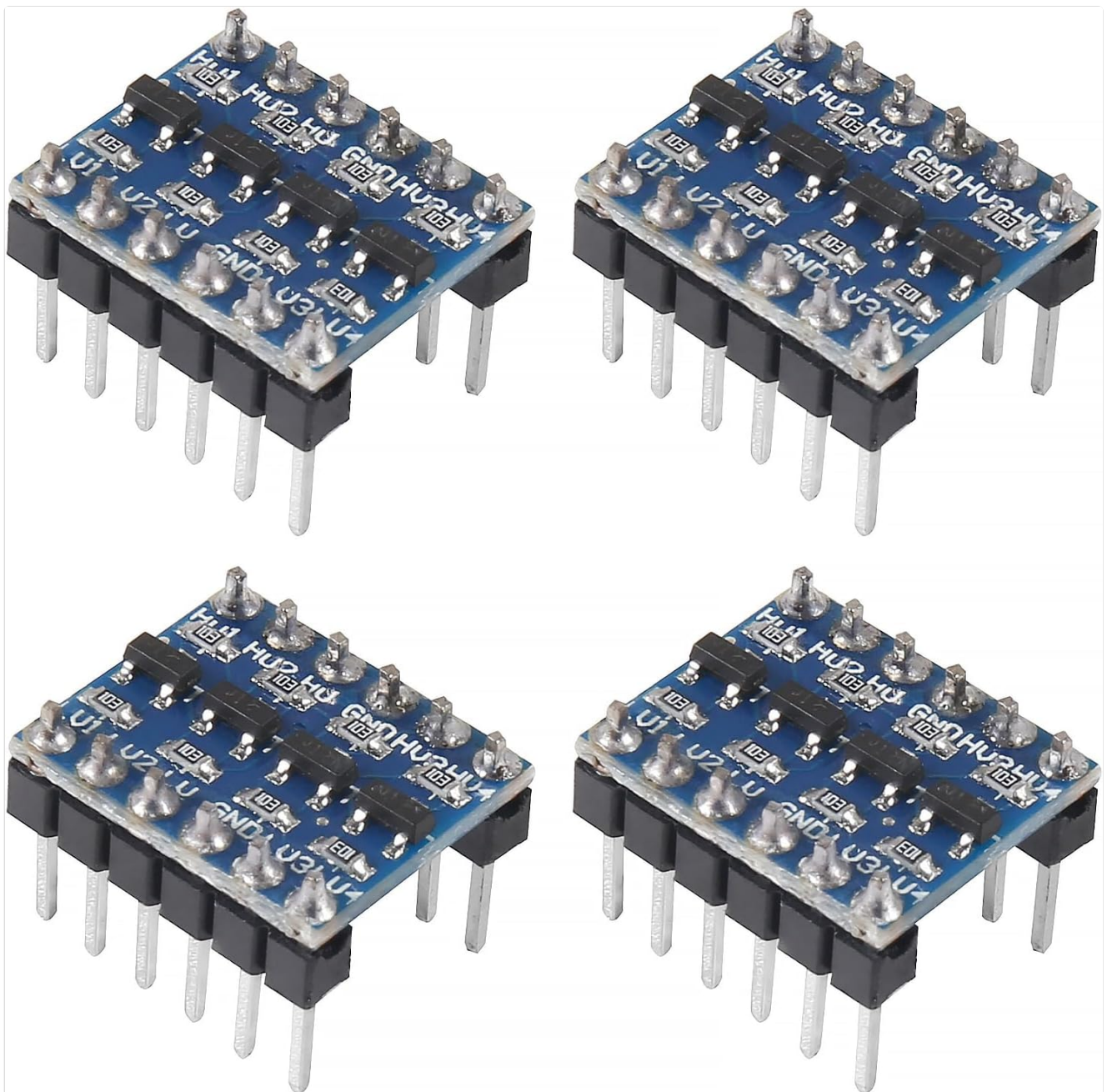


Figure 1: Four Coliao 4-Channel IIC I2C Logic Level Converter modules.

2. SPECIFICATIONS

Feature	Description
Voltage Stepper	High voltage (HV) side: 5V, Low voltage (LV) side: 3.3V
Channels	4 independent bi-directional channels
Interface Compatibility	I2C, SPI, UART, and other digital signals
Pre-soldered	Yes, with headers attached
Material	Metal, Plastic
Dimensions (approx.)	14mm x 12mm x 8.5mm (L x W x H, excluding pins)

Pin Descriptions:

- **HV (High Voltage):** Connect to the higher voltage supply (e.g., 5V) of your system.
- **LV (Low Voltage):** Connect to the lower voltage supply (e.g., 3.3V) of your system.
- **GND (Ground):** Common ground connection for both high and low voltage sides.
- **HV1-HV4:** High voltage side data pins.
- **LV1-LV4:** Low voltage side data pins.

Each pair of HVx and LVx pins forms a bi-directional channel. For example, data transmitted from HV1 will be received on LV1, and data transmitted from LV1 will be received on HV1.

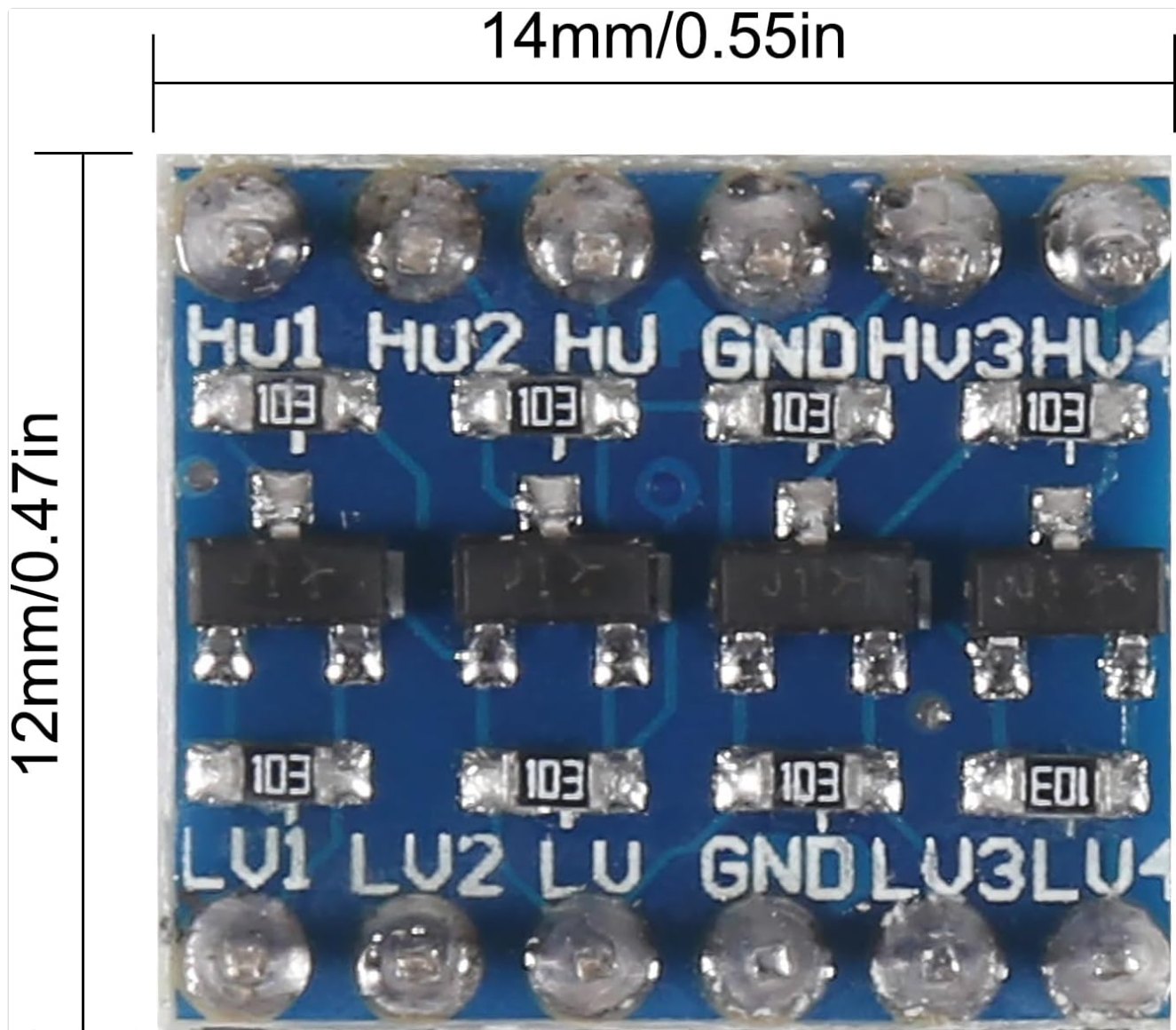


Figure 2: Top-down view of the module with approximate dimensions.

3. SETUP

Follow these steps to correctly connect the logic level converter to your circuits:

1. Power Connections:

- Connect the **HV** pin on the converter to the **5V power supply** of your high-voltage device (e.g., 5V Arduino).
- Connect the **LV** pin on the converter to the **3.3V power supply** of your low-voltage device (e.g., Raspberry Pi, 3.3V microcontroller).
- Connect the **GND** pin on the converter to the **common ground** of both your high-voltage and low-

voltage devices. It is crucial for both devices to share a common ground for proper operation.

2. Data Connections:

- Identify the data pins you need to convert. The module has four channels (HV1/LV1, HV2/LV2, HV3/LV3, HV4/LV4).
- Connect the data line from your **high-voltage device** to an available **HVx** pin on the converter.
- Connect the corresponding **LVx** pin on the converter to the data line of your **low-voltage device**.
- Repeat for all necessary data lines. For I2C communication, you would typically use two channels (SDA and SCL).

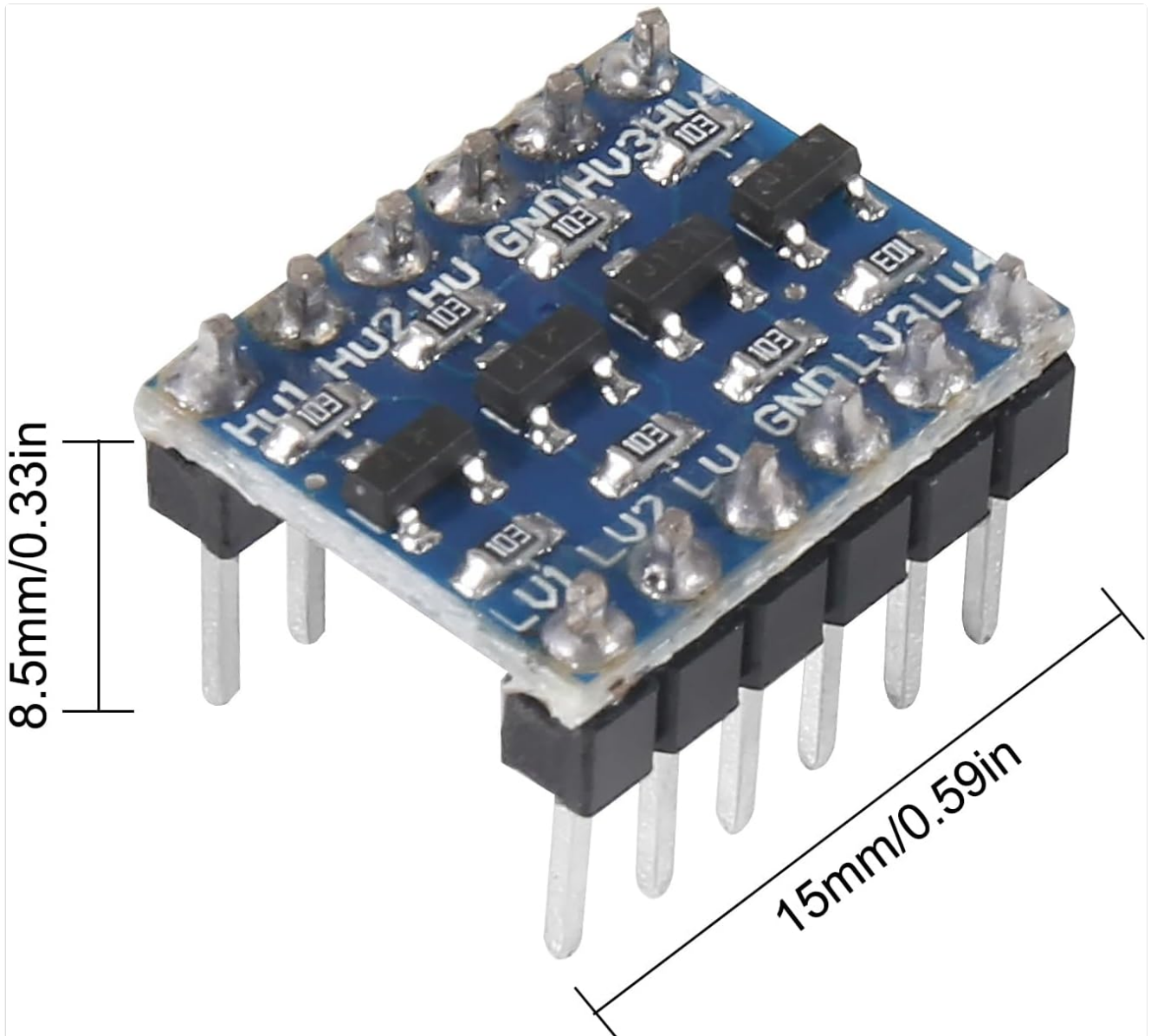


Figure 3: Angled view of the module highlighting pin labels.

Important: Ensure that both the HV and LV power pins on the converter are supplied with their respective voltages for all channels to function correctly. While a single channel might show some activity without full power, reliable bi-directional conversion for multiple channels requires both voltage inputs.

4. OPERATING INSTRUCTIONS

Once correctly wired, the Coliao Logic Level Converter operates automatically. It uses MOSFETs to provide bi-directional voltage translation for digital signals. When a signal is sent from the low-voltage side (e.g., 3.3V) to the

high-voltage side (e.g., 5V), the module steps up the voltage. Conversely, when a signal is sent from the high-voltage side to the low-voltage side, it steps down the voltage.

- **Bi-directional Functionality:** Each channel can transmit and receive data simultaneously, making it suitable for protocols like I2C which use a single data line for both directions.
- **Signal Integrity:** The module is designed to maintain signal integrity during voltage conversion, minimizing signal loss and ensuring reliable communication between devices.
- **Protection:** It acts as a buffer, protecting your sensitive microcontroller pins from potential damage due to voltage mismatches.

5. MAINTENANCE

The Coliao Logic Level Converter is a robust electronic component requiring minimal maintenance. To ensure its longevity and reliable operation:

- Keep the module clean and free from dust and debris.
- Avoid exposing the module to extreme temperatures or humidity.
- Handle with care to prevent physical damage to the pins or circuit board.
- Ensure all connections are secure to prevent intermittent operation.

6. TROUBLESHOOTING

If you encounter issues with your logic level converter, consider the following troubleshooting steps:

- **No Communication or Intermittent Signals:**
 - **Check Power Connections:** Verify that both the HV and LV pins are correctly connected to their respective voltage sources (e.g., 5V and 3.3V) and that these power supplies are active.
 - **Verify Ground Connection:** Ensure a common ground connection between the converter, the high-voltage device, and the low-voltage device. A missing or poor ground connection is a common cause of communication failure.
 - **Inspect Data Connections:** Confirm that data lines are connected to the correct HVx and LVx pairs and that there are no loose wires or short circuits.
- **Incorrect Voltage Levels:**
 - Use a multimeter to measure the actual voltages supplied to the HV and LV pins. Ensure they match the expected 5V and 3.3V.
 - Measure the voltage on the data lines on both sides of the converter to confirm proper level shifting.
- **Device Not Responding:**
 - Temporarily bypass the converter (if safe for your devices) to determine if the issue lies with the converter or the connected devices.
 - Ensure the communication protocol (I2C, SPI, UART) is correctly configured in your microcontroller's software.
- **Physical Damage:**
 - Visually inspect the module for any signs of burnt components, bent pins, or solder bridges.

7. WARRANTY AND SUPPORT

Warranty information for this product is typically provided by the retailer or manufacturer at the time of purchase. Please refer to your purchase documentation or contact the seller for details regarding warranty coverage and support options. For technical inquiries, consult online resources and community forums related to logic level converters and microcontrollers, as this product is widely compatible with standard electronic development platforms.

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Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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