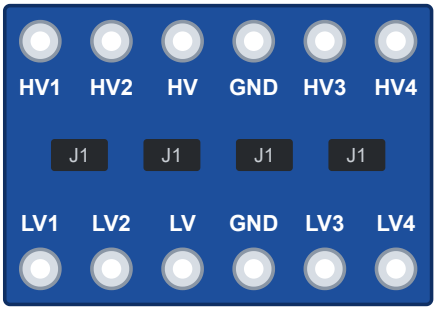
4-Channel Logic Level Converter

Join a 5 V board and a 3.3 V device safely: power both sides, match the channel numbers, then run an I2C scan to prove it works.

1 FIND THE TWO SIDES

HV row: to the 5 V board



LV row: to the 3.3 V device

HV1 pairs with LV1, HV2 with LV2, and so on. Each channel works in both directions.

2 WIRE IT: UNO TO A 3.3 V I2C SENSOR

CONVERTER PIN	CONNECT TO
HV	Uno **5V**
LV	Uno **3.3V** (and the sensor's VCC)
GND (both)	Uno GND and sensor GND
HV1	Uno **A4** (SDA)
HV2	Uno **A5** (SCL)
LV1	Sensor **SDA**
LV2	Sensor **SCL**

BEFORE YOU POWER UP

- **Both HV and LV must be connected.** Without them nothing converts.
- **LV goes to the lower voltage.** Swapped, the signals pass through unconverted.
- **Grounds joined:** the Uno and the sensor share GND.
- Solder the two headers in first, long pins down, so the board plugs into a breadboard.

3 RUN AN I2C SCAN

1. Paste this sketch into the Arduino IDE, choose your board and port, and upload. No library is needed.

```
#include <Wire.h>

void setup() {
  Wire.begin();
  Serial.begin(9600);
  for (byte a = 1; a < 127; a++) {
    Wire.beginTransmission(a);
    if (Wire.endTransmission() == 0) {
      Serial.print("Found 0x");
      Serial.println(a, HEX);
    }
  }
  Serial.println("Scan done");
}

void loop() {}
```

4 WHAT YOU SHOULD SEE

Open **Tools > Serial Monitor** at **9600 baud** and press the Uno's reset button. Your sensor's address prints, for example **Found 0x76** for a BMP280, then **Scan done**. Use that address in the sensor's own example sketch.

GOOD TO USE IT FOR

- I2C at 100 kHz, UART serial up to 115200 baud
- Slow SPI, about 1 MHz or less, and 1-Wire
- Not for WS2812 LED data, fast SPI displays or driving relays and LEDs

IF IT DOES NOT WORK

WHAT YOU SEE	CHECK
Only "Scan done", no address	HV on 5V and LV on 3.3V, grounds joined, and SDA and SCL on the same channel number each side (HV1 with LV1). Check the sensor has power.
Signals pass through at 5 V	LV and HV are swapped, or LV is not connected. LV must be the lower voltage.
Works, then errors at speed	Use 100 kHz I2C (**Wire.setClock(100000);** after Wire.begin) and keep wires short.
A relay or LED will not switch from it	The outputs only carry about 0.5 mA. Feed logic inputs only, not loads.

This guide online

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