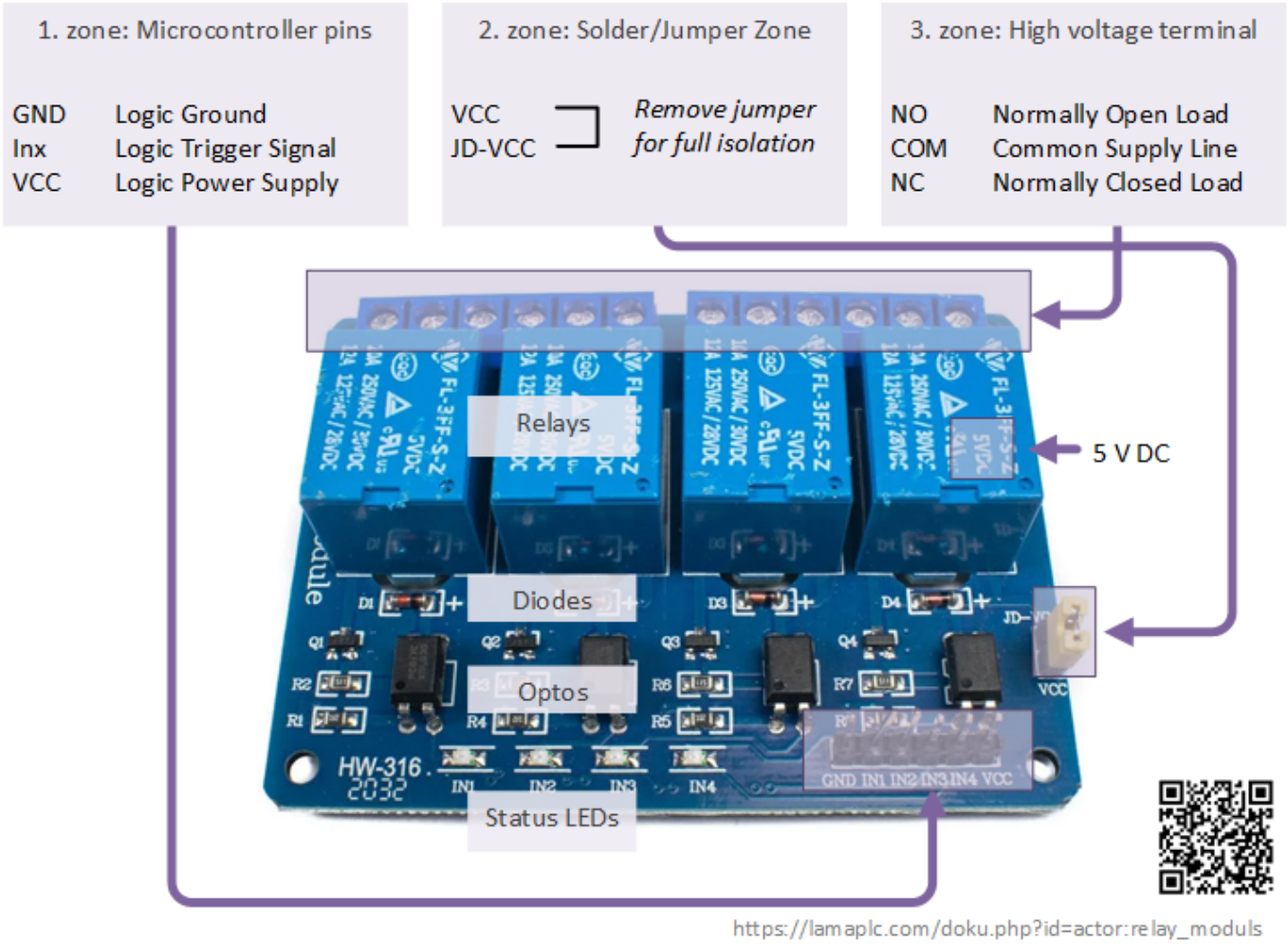
lamaPLC: Multi-channel optocoupled relay module

A multi-channel optocoupled relay module isolates high-voltage AC or DC circuits from low-power microcontrollers using internal infrared optocouplers.

Understanding relay voltage ratings is essential for microcontrollers. For Arduino, 5V/3.3V relays are typical, whereas Raspberry Pi Micro and ESP32/3286 generally require 3.3V relays.

These voltage ratings, such as *"5VDC"* or *"3VDC,"* are marked on the relays along with the maximum load capacity for AC and DC, for example, 10A at 250V AC or 30V DC, and 12A at 125V AC or 28V DC. In my experience, these maximum values are often overstated; I usually cut them in half. For example, for 240V AC, I consider a safe maximum of 5A, roughly 1000 Watts.



Current Required

Current Required per Logic Pin (IN1 to INx)

- **Per Active Channel:** 2 mA to 5 mA
- **The Math:** If you are using a 4-channel module (such as the HL-54) and turn all 4 channels ON at the same time, the logic pins will draw a combined total of 8 mA to 20 mA from your

controller side.

The VCC Pin Current (Microcontroller Side)

- **With the VCC/JD-VCC Jumper Removed (Recommended Setup):** The VCC pin consumes approximately 0.5 mA of idle current to bias the optocoupler circuit. The microcontroller does not provide power to the coil. A separate power supply module must be used, and the load it supplies should be considered.
- **With the VCC/JD-VCC Jumper On (Shared Power Setup):** The microcontroller needs to provide high current for the mechanical coils through its 5V pin. Each active relay coil draws between 70 mA and 100 mA. Turning on four relays at once could require up to 400 mA, which can overload and potentially crash microcontrollers like Raspberry Pi, Arduino, or ESP32.