Driving Loads

Electrical Engineering

Getting from a logic pin to a relay, motor or solenoid it could never drive directly.

The pin cannot supply the current, and the coil will fight back.

1. **Check the pin's limits**
   A GPIO sources tens of milliamps, and the whole port has its own limit.

2. **Pick the switching device**
   A logic-level MOSFET for DC loads, or a relay where isolation is needed.

3. **Condition the gate**
   A series resistor limits inrush; a pull-down holds the gate off at reset.

4. **Clamp the inductive kick**
   A flyback diode across the coil catches the reverse voltage spike.

5. **Separate the grounds**
   Return load current on its own path and join the grounds at one point.

Educational reference. Mains-voltage loads need isolation, enclosure and qualified supervision under local electrical regulations.