

ULN2803A – 8-channel relay/coil driver

TI / generic · SOIC-18 · Darlington array · ~\$0.4

WHAT IT IS

Eight transistor switches in a chip, each able to sink a relay coil (or any load) to ground when its input goes high. An MCU/expander pin can't source a relay coil's current directly – this is the muscle between logic and coils. Includes built-in flyback diodes.

KEY SPECS (what matters to us)

8 channels · sinks ~500 mA each · built-in base resistors
Internal freewheel (flyback) diodes, common cathode = COM pin

SIGNALS / PINS WE USE

I1-8 ← MCP23017 GPA · O1-8 → reed coils (low side)
COM (pin 10) → the coil supply (V5) · GND

ELECTRICAL · GOTCHAS

COM MUST go to the coil's + rail (V5), not GND – that's what makes the internal flyback diodes clamp the inductive kickback. (Verified correct in review; a classic place to get it wrong.)

WHY IT'S IN OUR SYSTEM

The Kill Grid switches 8 reed relays; the MCP23017 outputs can't drive coils. ULN2803 is the standard, cheap, 8-up coil driver with flyback built in – exactly one chip for the 8 channels.