

MCP23017 – 16-channel I2C GPIO expander (Kill Grid)

Microchip · SOIC-28 · I2C · ~\$1

WHAT IT IS

Adds 16 general-purpose I/O pins to the MCU over just two I2C wires. When you need more pins than the MCU has, this is the cheap way. In the Kill Grid it provides the 8 relay-control bits + reads the DIP.

KEY SPECS (what matters to us)

16 I/O (2 ports of 8) · I2C (3 address pins → 8 chips per bus)
Each pin individually input or output, with optional pull-ups

SIGNALS / PINS WE USE

SDA/SCL = I2C (note: this part's symbol calls SCL "SCK")
A0-2 = address (GND = 0x20) · ~RESET (pull-up)
GPA0-7 → relay driver inputs · GPB0-3 ← DIP

ELECTRICAL · GOTCHAS

GPIO default to INPUTS (hi-Z) at power-on → the relays stay off until firmware configures it (benign). ~RESET must be high to run.

WHY IT'S IN OUR SYSTEM

The Kill Grid needs 8 relay controls + DIP, but the cheap C3 doesn't have the pins. One MCP23017 on I2C (2 GPIO) gives all 16 – pin expansion without a bigger MCU. Keeps every module on the same cheap C3 brain.