

THVD1450 – RS-485 transceiver (the house bus driver)

Texas Instruments · SOIC-8 · half-duplex RS-485 · ~\$1

WHAT IT IS

Turns the MCU's single-ended UART (TX/RX, 0–3.3 V) into a robust DIFFERENTIAL pair (A/B) that survives long noisy cable runs, and back. This is what every module uses to talk on the shared house bus – many modules on two wires, one talking at a time.

KEY SPECS (what matters to us)

3.3 V · half-duplex · up to 500 kbps+ (we run 250)
±16 kV ESD · built-in idle fail-safe (defined state on a quiet bus)
Up to 256 nodes on a segment

SIGNALS / PINS WE USE

RO→MCU RX · DI←MCU TX · DE/~RE = direction (one GPIO)
A/B = the differential bus pair · VCC 3.3 V

ELECTRICAL · GOTCHAS

Termination (120 Ω) + bias resistors belong ONLY on the two physical ends of the bus – mid-chain units leave them DNP, or they over-load the bus. DE/~RE tied together = one line flips talk/listen.

WHY IT'S IN OUR SYSTEM

The physical layer of the whole modular system. Chosen over MAX485 for TI robustness (±16 kV ESD, true 3.3 V, idle fail-safe). The "house bus" decision (session 7): a Eurorack-native data ribbon every module taps – RS-485 is the proven, cheap, long-haul-capable way to do it.