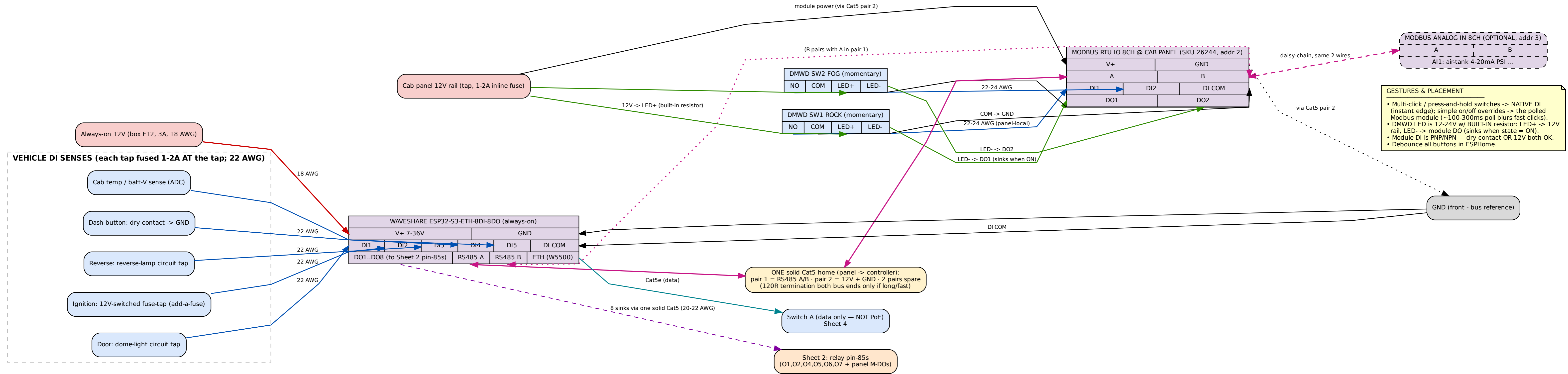


FULL WIRING SHEET 3 of 5 — FRONT-BOARD I/O + RS485 PANEL, PIN-LEVEL (rev 3.32 — Option B)
 This is the FRONT Waveshare. The BED Waveshare is its own cluster (combiner + camp loads + a tailgate Modbus panel) — see sheet 7 + sheet 6.
 Waveshare ESP32-S3-ETH-8DI-8DO: DIs optocoupler-isolated (wire each sense + the DI COM), DOs = 500mA Darlington sinks w/ built-in flyback.
 Sense taps off vehicle circuits get a SMALL fuse (1-2A) AT THE TAP. DI/DO signal wiring = 20-22 AWG or solid Cat5 (secure every 12in; stranded across door jambs).
 LEGEND: blue = DI sense in · purple dashed = DO sink out (to Sheet-2 pin 85) · magenta = RS485 bus · green = LED drive · red = 12V power · black = ground



GESTURES & PLACEMENT

- Multi-click / press-and-hold switches -> NATIVE DI (instant edge); simple on/off overrides -> the polled Modbus module (~100-300ms poll blurs fast clicks).
- DMWD LED is 12-24V w/ BUILT-IN resistor: LED+ -> 12V rail, LED- -> module DO (sinks when state = ON).
- Module DI is PNP/NPN — dry contact OR 12V both OK.
- Debounce all buttons in ESPHome.

ONE solid Cat5 home (panel -> controller):
 pair 1 = RS485 A/B · pair 2 = 12V + GND · 2 pairs spare
 (120R termination both bus ends only if long/fast)

Switch A (data only — NOT PoE)
 Sheet 4

Sheet 2: relay pin-85s
 (01,02,04,05,06,07 + panel M-DOs)