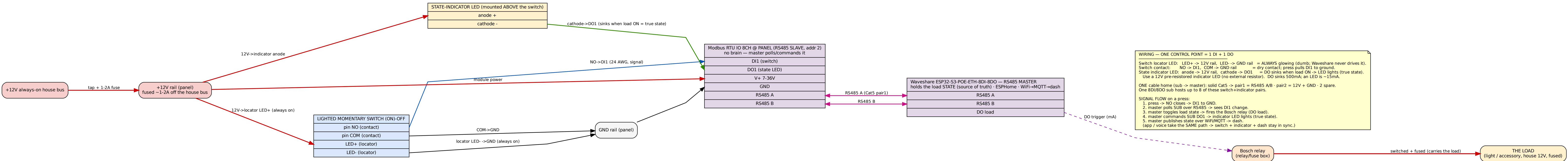


2014 RAM 1500 Carputer — LIGHTED SWITCH + SEPARATE STATE-INDICATOR LED, on the two-board chain (ESP32-S3 MASTER <-> Modbus IO SUB over RS485)
 Design: the switch's OWN light is a dumb ALWAYS-ON locator (find it in the dark). A SEPARATE LED mounted ABOVE the switch shows TRUE LOAD STATE, driven by a Waveshare DO.
 Two light jobs, decoupled: locator = hardwired to 12V (Waveshare never touches it) · state indicator = low-side switched by a DO (12V on the anode, DO grounds the cathode).
 Why: on a MOMENTARY switch a contact-tied light can't stay lit. Separating them keeps the state light in sync with voice/app/auto, and frees switch choice.
 LEGEND: blue = contact->DI · green = indicator LED- ->DO (sink = load ON) · red = +12V · black = GND · magenta = RS485 · purple dashed = DO->load relay



WIRING — ONE CONTROL POINT = 1 DI + 1 DO

Switch locator LED: LED+ -> 12V rail, LED- -> GND rail = ALWAYS glowing (dumb; Waveshare never drives it).
 Switch contact: NO -> DI1, COM -> GND rail = dry contact; press pulls DI1 to ground.
 State indicator LED: anode -> 12V rail, cathode -> DO1 = DO sinks when load ON -> LED lights (true state).
 Use a 12V pre-resistor indicator LED (no external resistor). DO sinks 500mA; an LED is ~15mA.

ONE cable home (sub -> master): solid Cat5 -> pair1 = RS485 A/B · pair2 = 12V + GND · 2 spare.
 One 8DI/8DO sub hosts up to 8 of these switch+indicator pairs.

SIGNAL FLOW on a press:

- press -> NO closes -> DI1 to GND.
- master polls SUB over RS485 -> sees DI1 change.
- master toggles load state -> fires the Bosch relay (DO load).
- master commands SUB DO1 -> indicator LED lights (true state).
- master publishes state over WiFi/MQTT -> dash.

(app / voice take the SAME path -> switch + indicator + dash stay in sync.)