

This module turns the car lights on and off using ambient light.

An ESP32-C3 SuperMini reads two light sensors and drives a 12 V relay module that switches the car lights.

Main parts

- ESP32-C3 SuperMini development board (3.3 V logic, 5 V power in)
 - BH1750 I2C light sensor
 - TEMA6000 analog light sensor
 - I2C OLED screen for debug
 - MINI-360 (MP2307) buck converter, 12 V car → 5 V
 - 12 V relay module with optocoupler, high / low level trigger (DC+, DC-, IN, NO, NC, COM)
 - Fuse, wires, connectors, car-grade 12 V plugs
-

ESP32 pins used

- 5V → power from MINI-360 OUT+
- 3V3 → BH1750 VCC, TEMA6000 VCC, OLED VCC
- GND → all grounds (car, buck, sensors, relay)
- GPIO 6 → I2C SDA (BH1750, OLED)
- GPIO 7 → I2C SCL (BH1750, OLED)
- GPIO 1 (ADC) → TEMA6000 OUT
- GPIO 4 → Relay IN

All GND points (car, buck converter, ESP32, sensors, relay module) must be connected together.

Power wiring

- Car 12 V → fuse → MINI-360 **IN+**
- Car GND → MINI-360 **IN-**
- Set MINI-360 output to **5 V** with a meter.
- MINI-360 **OUT+** → ESP32-C3 SuperMini **5V** pin
- MINI-360 **OUT-** → ESP32 **GND** pin

Use the ESP32 **3V3** pin to feed the BH1750, TEMA6000 and the I2C screen.

Sensors and screen

BH1750 (I2C)

- VCC → 3V3
- GND → GND
- SDA → ESP32 **GPIO 6**
- SCL → ESP32 **GPIO 7**

TEMA6000 (analog)

- VCC → 3V3
- GND → GND
- OUT → ESP32 **GPIO 1 (ADC)**

I2C OLED screen

- VCC → 3V3
 - GND → GND
 - SDA → ESP32 **GPIO 6**
 - SCL → ESP32 **GPIO 7**
-

Relay module and car lights

Relay power and control

- DC+ → car 12 V (same point as MINI-360 IN+)
- DC- → car GND
- IN → ESP32 **GPIO 4** (set as output in code)

Set the jumper on the relay board to **H** for high-level trigger (3.3 V).

Relay output to car lights

- Battery + (after fuse) → relay **COM**
- Relay **NO** (normally open) → car light input wire
- Relay **NC** is not used.

When the ESP32 sets GPIO 4 HIGH, the relay closes and sends 12 V to the car lights.