

DRV8833 Motor Driver

Two DC motors, or one stepper, from four pins. SLP must be HIGH.

✗ VM 2.7 to 10.8 V, and never above 11.8 V

VM is the only supply and it goes straight to the chip. 11.8 V is its absolute maximum, so a 12 V adapter, or a three-cell lithium pack at 12.6 V off the charger, can destroy it. Two cells (7.4 V) or four to six AA cells are safe.

Pins, and which to wire

Chip side up, header at the bottom, as the board ships. Motor A is the left terminal, motor B the right; on both, the upper pad is OUT1.

Power: GND and VM

2.7 to 10.8 V. The header's VM pin is the same net.

R1, R2: 0 Ω

No current limit: VM and the motor set the current.

Motor A

AOUT1 upper, AOUT2 lower. The back prints 1 and 2.

Red power LED

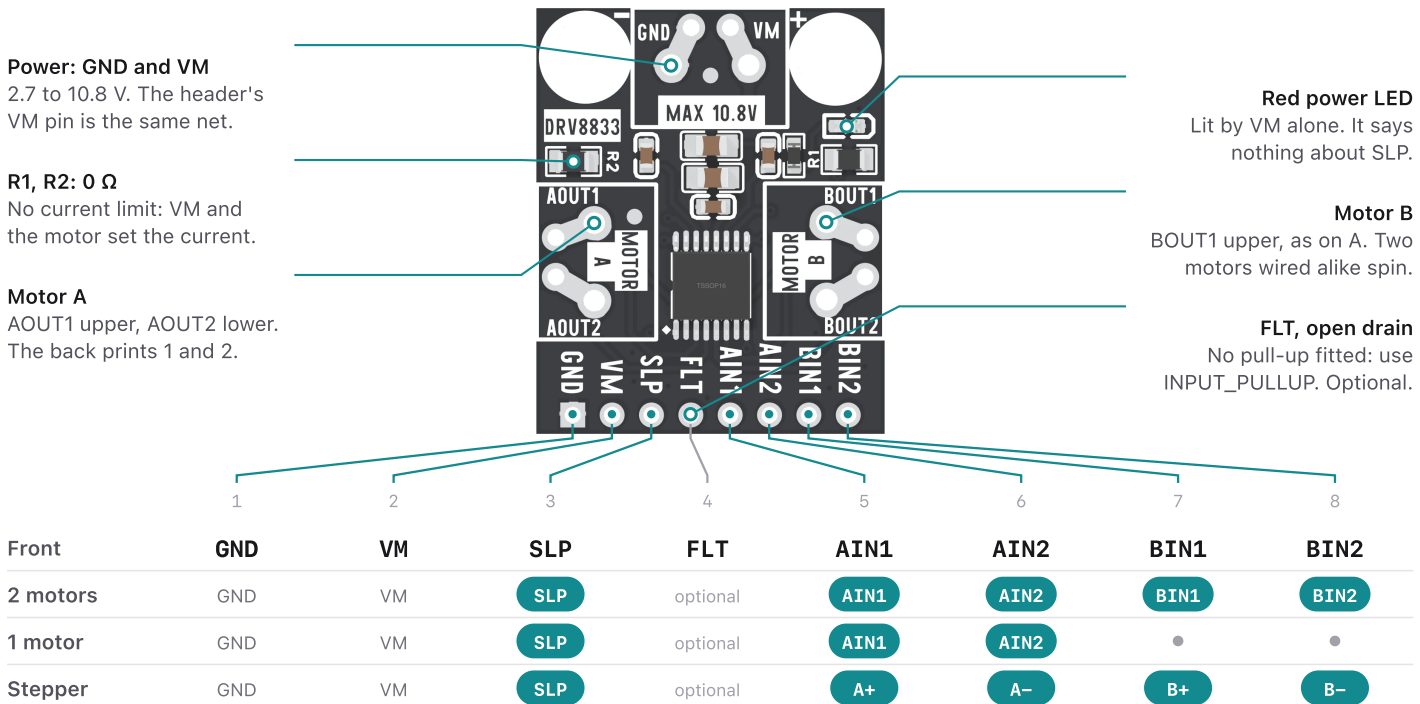
Lit by VM alone. It says nothing about SLP.

Motor B

BOUT1 upper, as on A. Two motors wired alike spin.

FLT, open drain

No pull-up fitted: use INPUT_PULLUP. Optional.



SLP is not optional

The chip holds SLP LOW with its own 500 k Ω , so an unwired SLP is asleep, and an asleep driver looks dead: no sound, no heat. The LED still lights. Drive SLP HIGH from a pin, or tie it to VM through 20 to 75 k Ω .

The three numbers that decide it

VM, the only supply

2.7–10.8 V to run

Below about 2.6 V the chip shuts down; above 11.8 V it is damaged. It makes its own logic rail, so there is no 3.3 V pin.

SLP reads HIGH at

2.5 V or more

The other four inputs need 2 V. A 3.3 V or 5 V GPIO clears both; a sagging divider may not.

Overcurrent trip

2–3.3 A per channel

The chip cuts that motor, pulls FLT LOW and retries after 1.35 ms. A stall trips it again at once, so FLT stays mostly LOW.

Pick VM for the motor, not for the microcontroller: it is the motor's voltage. Wire SLP, or nothing moves. Read FLT with a falling-edge interrupt: a stall holds it LOW, but a single trip lasts only 1.35 ms.

All figures from TI's DRV8833 datasheet (SLVSAR1E), not measured on this board. The trip and retry are the chip's own; the 0 Ω sense resistors do not change them.

Two motors, and the fault pin

Arduino IDE · Board: your board · ESP32-S3: USB CDC On Boot: Enabled

```
// Pins: S3 below. Uno: 4, 5, 6, 9, 10, FLT 2.
const int SLP = 4, FLT = 16;
const int AIN1 = 5, AIN2 = 6, BIN1 = 7, BIN2 = 15;
volatile unsigned faults = 0;

void onFault() { faults++; }

// -255..255. analogWrite(pin, 0) is LOW: a pin that has
// been PWM'd on an ESP32 ignores digitalWrite.
void drive(int in1, int in2, int speed) {
  analogWrite(in1, speed > 0 ? speed : 0);
  analogWrite(in2, speed < 0 ? -speed : 0);
}

void setup() {
  Serial.begin(115200);
  pinMode(SLP, OUTPUT);
  pinMode(FLT, INPUT_PULLUP);          // no pull-up on the board
  attachInterrupt(digitalPinToInterrupt(FLT), onFault, FALLING);
  digitalWrite(SLP, HIGH);             // wake the driver
  delay(1);                             // it takes up to 1 ms
}

void loop() {
  drive(AIN1, AIN2, 200); drive(BIN1, BIN2, 200); // forward
  delay(1500);
  drive(AIN1, AIN2, 0);   drive(BIN1, BIN2, 0);   // coast
  delay(500);
  drive(AIN1, AIN2, -200); drive(BIN1, BIN2, -200); // reverse
  delay(1500);
  drive(AIN1, AIN2, 0);   drive(BIN1, BIN2, 0);
  Serial.print("#faults: ");
  Serial.println(faults);
  delay(500);
}
```

faults: 0
faults: 0
Serial Monitor at 115200, every 4 s. A number that climbs while a motor is held still is the overcurrent trip, once per 1.35 ms retry.

Coast, brake, and which way

Each motor reads its two inputs as a pair. One HIGH and one LOW turns it, and which one is HIGH sets the way. Both LOW coasts: the outputs let go and the motor winds down. Both HIGH brakes: the motor's two leads are joined through the chip and it stops quickly. PWM on the HIGH input sets the speed. If one motor on a chassis runs backwards, swap its two leads.

When it does not work

Nothing moves, LED lit

SLP is LOW or unwired. Drive it HIGH from a pin.

Moves, then stops and restarts

A stall or short past 2 A trips it and FLT goes LOW. Lower the load or VM.

One motor turns the wrong way

Swap that motor's two leads. The board is not wrong.

Specifications

Driver	TI DRV8833, two H-bridges	VM	2.7 to 10.8 V, 11.8 V max
Logic supply	None; made from VM	Inputs	HIGH from 2 V; SLP from 2.5 V
Trip	2 to 3.3 A, retry 1.35 ms	Sense resistors	0 Ω, no current limit
Terminals	KF301, 5.0 mm, loose	Board	22.5 × 27.5 mm, 2 × Ø4.8 mm

Wiring

	FRONT	S3	UNO	ESP32
1	GND	GND	GND	GND
2	VM	batt +	batt +	batt +
3	SLP	4	4	4
4	FLT	16	2	21
5	AIN1	5	5	16
6	AIN2	6	6	17
7	BIN1	7	9	18
8	BIN2	15	10	19

Hole 1 is the square pad. VM goes to the motor battery, never to your board's 3V3 or 5V pins, and the battery's minus to GND with your board's GND. Motors go on the side terminals.