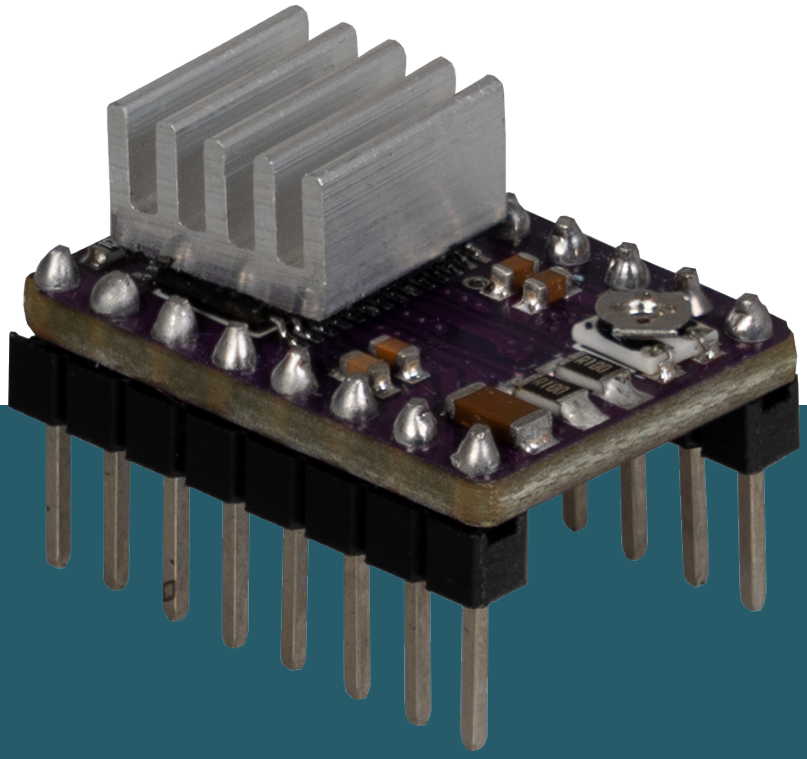


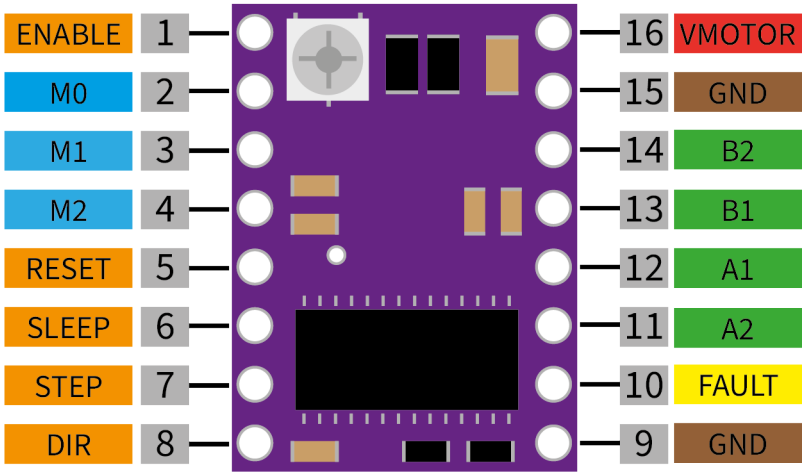
MOTOR DRIVER
SBC-MD-DRV8825

1. GENERAL INFORMATION

Dear customer
thank you for choosing our product. In the following we will show you what you need to bear in mind when commissioning and using.

Should you encounter any unexpected problems during use, please do not hesitate to contact us.

2. PIN ASSIGNMENT



CONTROL
MODE
POWER
GND
MOTOR
FAULT

- **ENABLE**: This pin is used to disable the driver when this pin is set to high (H) and to enable it when set to low (L). Internal pull-down resistor is present.
- **M0, M1, M2**: These pins are used to set the microstep resolution. They are equipped with pull-down resistors and can be configured with various high/low combinations to set the desired step resolution.
- **RESET**: Resets the driver to the initial state when this pin is set to low (L).
- **SLEEP**: Switches the driver to energy-saving mode when this pin is set to Low (L).
- **STEP**: This pin is used to send a step command to the driver. Each high signal (H) on this pin moves the motor by one step in the set step resolution.
- **DIR**: This pin determines the direction of rotation of the motor. For example, a high signal (H) can stand for forward direction and a low signal (L) for reverse direction.
- **VMOTOR**: This pin is connected to the supply voltage of the motor. It can accept voltages between 8.2 V and 45 V.
- **GND**: This pin is the common ground for the motor and logic supply.
- **A1, A2, B1, B2**: These pins are connected to the two coils of the bipolar stepper motor.
- **FAULT**: This pin indicates that a fault has occurred (e.g. overcurrent protection or thermal shutdown). A low signal (L) on this pin indicates a problem.

3. MICROSTEPS

The DRV8825 enables the setting of different microstep resolutions for the precise control of stepper motors. The resolution of the steps is set by configuring three pins on the driver board: M0, M1 and M2. These pins are equipped with pull-down resistors, which means that they are set to low (L) by default unless they are actively set to high (H).

Different combinations of these pins allow you to choose between six step resolutions: Full Step, Half Step, 1/4 Step, 1/8 Step, 1/16 Step and 1/32 Step. Here is the pin configuration for each resolution:

M0	M1	M2	MICROSTEPS
LOW	LOW	LOW	Full step
HIGH	LOW	LOW	Half step
LOW	HIGH	LOW	1/4 step
HIGH	HIGH	LOW	1/8 step
LOW	LOW	HIGH	1/16 step
HIGH	LOW	HIGH	1/32 step
LOW	HIGH	HIGH	1/32 step
HIGH	HIGH	HIGH	1/32 step

4. ADJUSTING THE MOTOR DRIVER

Setting the current for the DRV8825 motor driver is essential in order to operate the stepper motor safely and efficiently. If the current is set too high, the motor can overheat, which can damage the windings in the long term and lead to failure. If, on the other hand, the current is too low, the motor will not receive enough power, causing it to lose steps or not start at all. Correct current limiting also protects the driver itself from overloading and overheating, as it could switch off automatically if the current is too high. It is therefore important to set the maximum current so that it matches the specification of the motor.

To set the current, the so-called reference voltage (VREF) is measured and adjusted on the DRV8825 potentiometer. This voltage directly controls the maximum phase current of the motor. The DRV8825 uses resistors with a value of 0.1 Ohm to measure the current. The formula for calculating the motor current is as follows:

$$I_{\max} = \frac{Vref}{5 \times Rsense}$$

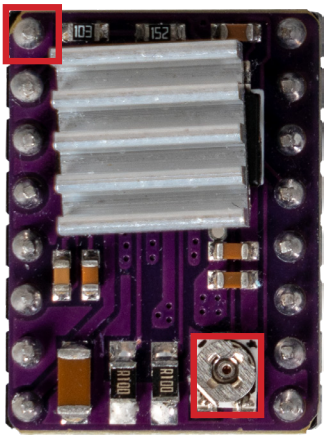
Since Rsense is 0.1Ω for our DRV8825, the formula is simplified:

$$I_{\max} = Vref \times 2$$

This means that a set VREF of 0.6V corresponds to a maximum motor current of 1.2A.

To set the reference voltage correctly, the driver is either plugged directly into a CNC board or supplied independently with a suitable supply voltage. The stepper motor should not yet be connected in order to avoid damage. A multimeter is used in DC voltage mode, with the black measuring tip connected to GND and the red measuring tip touching the measuring point of the potentiometer. Carefully turning the potentiometer clockwise increases VREF while turning it anti-clockwise decreases it. The desired voltage is set using the previous calculation.

Once the current has been adjusted according to the motor specification, the motor can be connected and tested. During operation, it should be checked that the motor rotates smoothly, that no excessive heat is generated and that the driver does not go into overload protection. If the motor gets too hot or behaves unusually, the setting can be fine-tuned again.



5. EXAMPLE CODE

This simple example demonstrates the basic control of a stepper motor with the DRV8825 using an Arduino

ATTENTION !!!
No end position detection, the motors do not stop automatically.

```
// Define the pin assignments
const int dirPin = 5; // DIR pin connected to pin 5
const int stepPin = 2; // STEP pin connected to pin 2
const int enablePin = 8; // ENABLE pin connected to pin 8

void setup() {
 // Set the pin modes
 pinMode(stepPin, OUTPUT);
  pinMode(dirPin, OUTPUT);
  pinMode(enablePin, OUTPUT);

 // Activate the driver
 digitalWrite(enablePin, LOW);
}

void loop() {
 // Set the direction of rotation
  digitalWrite(dirPin, HIGH); // or LOW for the other direction

 // Take 200 steps
 for(int i = 0; i < 200;  i++) {
   // Take a step
    digitalWrite(stepPin, HIGH);
    delayMicroseconds(800); // Pause between steps
    digitalWrite(stepPin, LOW);
    delayMicroseconds(800);
  }

 // Short pause between changes in direction of rotation
  delay(1000);

 // Change direction
  digitalWrite(dirPin, LOW); // Change the direction to LOW

 // Take 200 steps in the other direction
 for (int i =  0; i < 200; i++) {
    digitalWrite(stepPin, HIGH);
    delayMicroseconds(800);
    digitalWrite(stepPin, LOW);
    delayMicroseconds(800);
  }

 // Break before the next round
  delay(1000);
}
```

6. FURTHER INFORMATION

Our information and take-back obligations under the German Electrical and Electronic Equipment Act (ElektroG)

Symbol on electrical and electronic equipment:

This crossed-out waste bin means that electrical and electronic appliances **do not** belong in household waste. You must dispose of old appliances at a collection point. Before handing in old batteries and accumulators that are not enclosed in the old appliance must be separated from it.

Return options:
As an end user, you can return your old appliance (which essentially fulfils the same function as the new appliance purchased from us) for disposal free of charge when purchasing a new appliance. Small appliances with no external dimensions greater than 25 cm can be disposed of in normal household quantities regardless of the purchase of a new appliance.

Returns can be made at our company location during the opening hours:
SIMAC Electronics GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn

Return option in your neighbourhood:
We will send you a parcel stamp with which you can return the device to us free of charge. To do so, please contact us by e-mail at Service@joy-it.net or by telephone.

Packaging information:
Please pack your old appliance securely for transport. If you do not have suitable packaging material or do not wish to use your own, please contact us and we will send you suitable packaging.

7. SUPPORT

We are also there for you after your purchase. If any questions remain un-answered or problems arise, we are also available to assist you by e-mail, telephone and ticket support system.

E-mail: **service@joy-it.net**
Ticket system: https://support.joy-it.net
Phone: +49 (0)2845 9360 - 50

For more information, please visit our website:
www.joy-it.net

Published: 2025.03.06