

# Bipolar Stepper Motors

(E.g. Nema 14, 35mm)

Stepper Motors with Arduino - Controlling Bipolar & Unipolar stepper motors

Dronebotworkshop

<https://www.youtube.com/watch?v=0qwrnUeSpYQ&t=952s>

Stepper Motors with Arduino – Getting Started with Stepper Motors

Dronebotworkshop

<https://dronebotworkshop.com/stepper-motors-with-arduino/>

Chapter 10 - Exploring Stepper Motors (28-BYJ-48) with an Arduino Modest Maker

<https://www.youtube.com/watch?v=SUziz1zupGk>

-1 Bipolar motors require that you be able to reverse the current in order to spin the motors in the opposite direction.

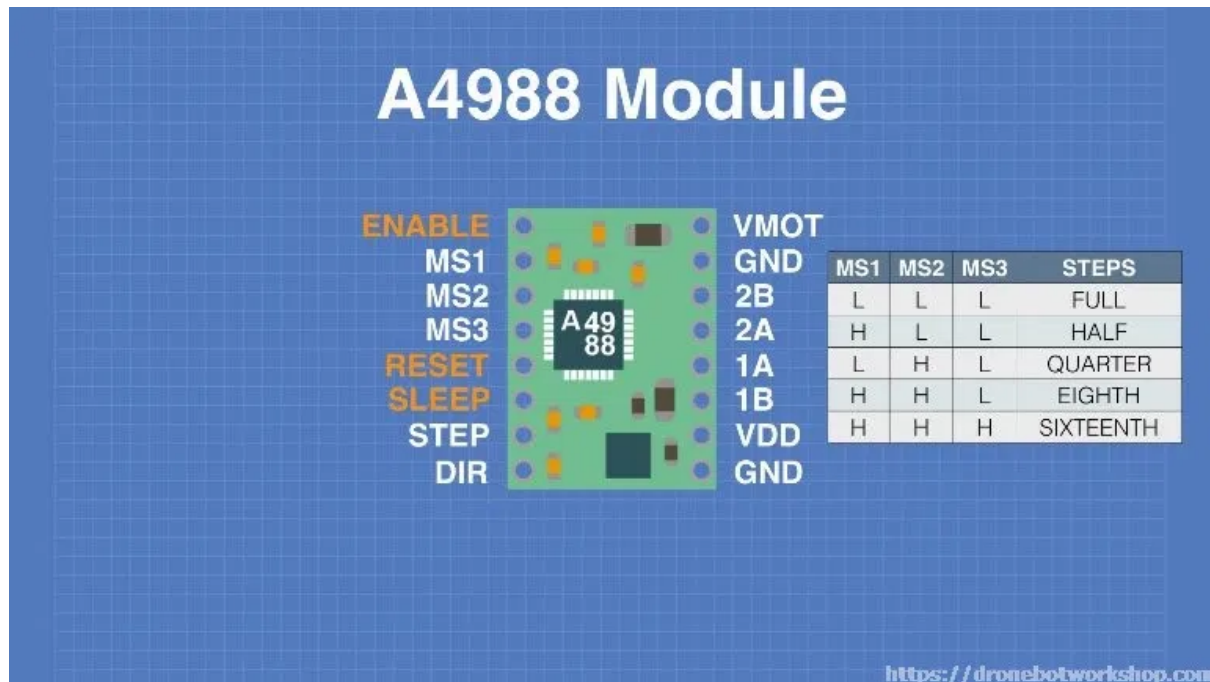
2- An H-Bridge (L298N) controller can be used to control one stepper motor (that has two coils).

3- Instead of using an H-Bridge we will control the stepper using the A4988 controller.

The A4988 only requires two inputs from the Arduino to control the stepper motor and does not need the Arduino to “figure out” the stepping logic. This makes it a lot easier to control multiple stepper motors for advanced projects.

#### 4- A4988 Pinout

Ref: <https://dronebotworkshop.com/stepper-motors-with-arduino/>



Starting from the top right and working down we see the following pins:

- **VMOT** – The motor DC supply voltage (positive). The maximum voltage is 35 volts.
- **GND** – The motor supply voltage ground.
- **2B, 2A** – The connections to coil 2 of the bipolar stepper motor.
- **1A, 1B** – The connections to coil 1 of the bipolar stepper motor.
- **VDD** – The logic supply DC voltage (positive) . This can range from 3 to 5.5 volts.
- **GND** – The logic supply ground.

Now looking down the other side of the A4988 module:

- **ENABLE** – This is an active low connection, when brought low (ground) the A4988 module is enabled. By default this is pulled low so the module is always enabled unless you apply a logic high here.
- **MS1, MS2, MS3** – These three connections determine the microstepping mode of the A4988 module. By setting the logic levels here you can set the motor to Full, Half, Quarter, Eighth or Sixteenth steps. See the chart on the connection diagram for details.

- **RESET** – This is an active low line that will reset the module. By default it is pulled high.
- **SLEEP** – If this line is set low the module will enter a low-powered sleep mode and consume minimal current. By tying this line to the Reset pin the module will always be on at full power consumption.
- **STEP** – This is how you drive the motor from an external microcontroller or square wave oscillator. Each pulse sent here steps the motor by whatever number of steps or microsteps that has been set by MS1, MS2 and MS3 settings. The faster you pulse this the faster the motor will travel.
- **DIR** – The direction control A high input here drives the motor clockwise, a low will drive it counterclockwise.

## 5- Connections to the Arduino

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