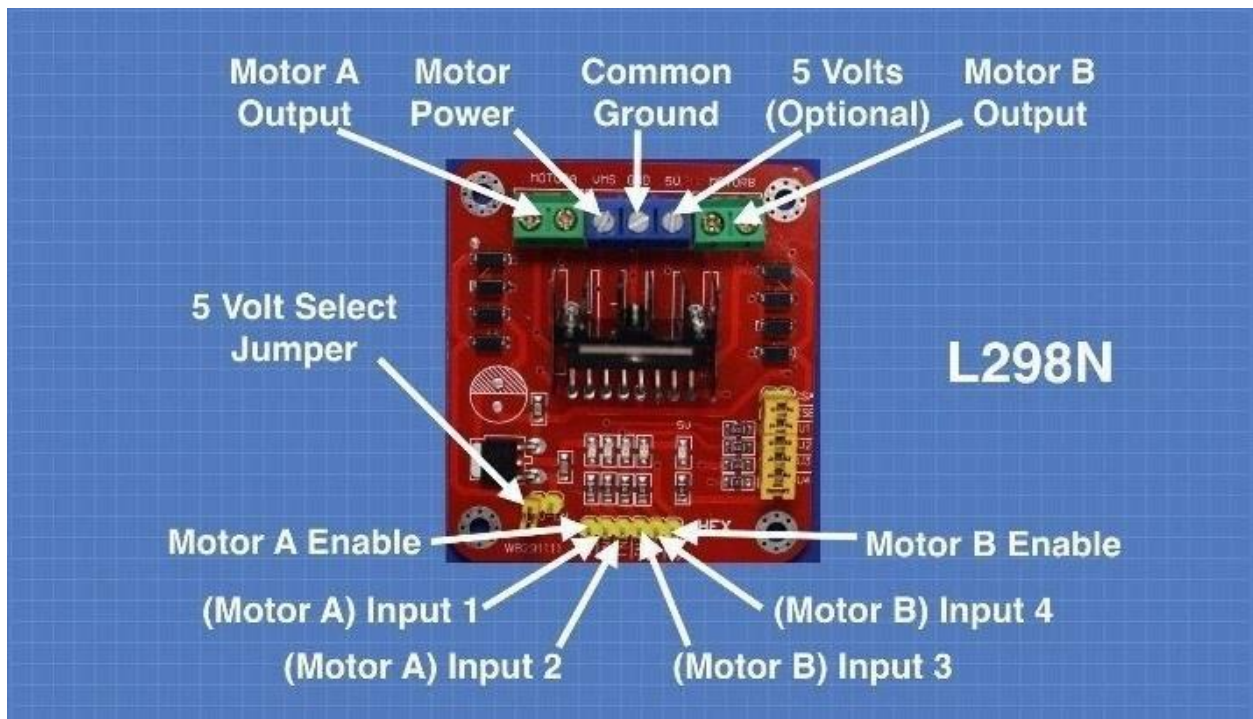


L298N Module Pinouts

You'll find a few different styles of L298N boards but they all operate in the same fashion. The board contains an L298N mounted on a heatsink, a 5 volt voltage regulator to "optionally) provide power for logic circuits, supporting diodes and capacitors and connectors as follows:

- Logic inputs for each H-Bridge circuit
- Power supply inputs for the motor power supply
- An optional 5 Volt power input for the logic circuits.
- Outputs for each DC motor

A typical L298N Board is shown here.



You'll notice that the board also has a number of jumpers. Most of the time you will leave them in place, with the exception of one. They are as follows:

- **CSA** – This is the “current sensing” function for Motor A. If the jumper is in this function is ignored. Most of the time you’ll leave this jumper in place.
- **CSB** – The “current sensing” function for Motor B. Again you’ll usually just leave this in place to disable this function.
- **U1** – Input 1 pull-up resistor. You will usually leave this in place, which enables a 10k pull-up resistor for the input.
- **U2** – Input 2 pull-up resistor.
- **U3** – Input 3 pull-up resistor.
- **U4** – Input 4 pull-up resistor.
- **5v-EN** – This is the only jumper that you need to really pay attention to. When this jumper is in place it enables the boards internal 78M05 5 Volt regulator, supplying logic power from the motor power supply. When this jumper is enabled you will NOT supply 5 volts to the 5 Volt input terminal. When the jumper is removed you will need to supply 5 Volts to the 5 Volt input terminal.

If you do use the internal voltage regulator you’ll have to supply the motor power supply with at least 7.5 volts.

Speaking of the motor power supply it needs to be a bit higher voltage than the actual motor requirements. This is due to the internal voltage drop in the transistors that form the H-Bridge circuit. The combined voltage drop is 1.4 volts, so if you are using 6 Volt motors you’ll need to give the board 7.4 volts, if you have 12 volt motors then your motor supply voltage will need to be 13.4 volts.

The board has four input terminals plus two enable terminals. You will use these terminals to control both direction and speed or each motor. They are as follows:

- **IN1** – Input 1 for Motor A
- **IN2** – Input 2 for Motor A
- **IN3** – Input 3 for Motor B
- **IN4** – Input 4 for Motor B
- **EN1** – Enable line for Motor A
- **EN2** – Enable Line for Motor B

In order to simplify things a bit I’ll just discuss the inputs and enable for Motor A, Motor B functions identically.

The two Input lines control the direction that the motor rotates. I will call one direction “forward” and the other one “reverse”, if it makes more sense to you just substitute “clockwise” and “counterclockwise”.

You control motor direction by applying either a Logic 1 (5 Volts) or Logic 0 (Ground) to the inputs. This chart illustrates how this is done.

INPUT 1	INPUT 2	DIRECTION
Ground (0)	Ground (0)	Motor Off
5 Volts (1)	Ground (0)	Forward
Ground (0)	5 Volts (1)	Reverse
5 Volts (1)	5 Volts (1)	Not Used

As you can see only two combinations are actually used to control the direction of the motors rotation.

The Enable line can be used to turn the motor on, to turn it off and to control its speed. When the Enable line is at 5 Volts (1) the motor will be on. Grounding the Enable line (0) will turn the motor off.

To control the speed of the motor you apply a Pulse Width Modulation (PWM) signal to the Enable line. The shorter the pulse width, the slower the motor will spin.