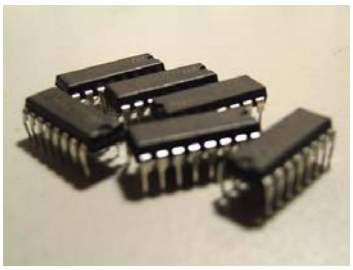
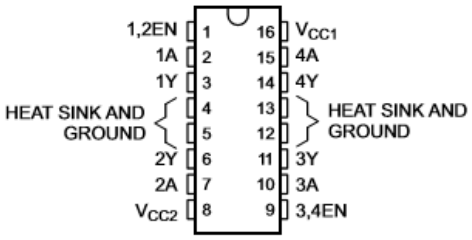
Motor Driver Operations

CONTROLLING MOTORS WITH L293D AND ARDUINO FOR DIFFERENT DRIVES



5 Pin Configuration and Functions

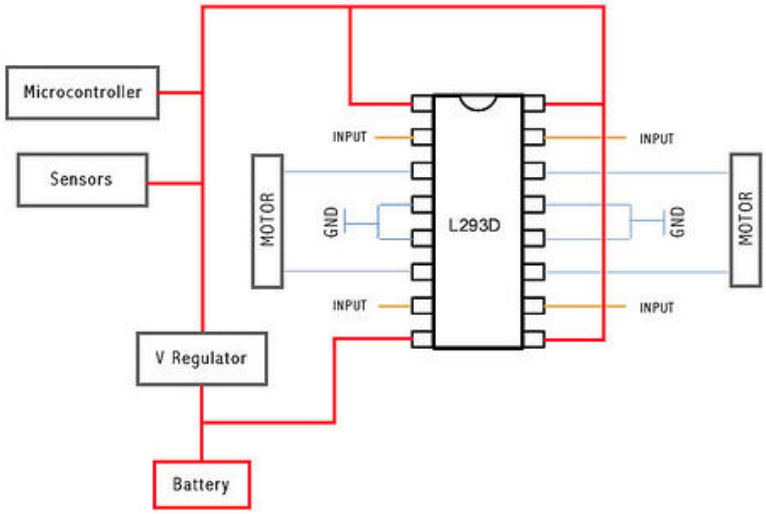
NE Package
16-Pin PDIP
Top View



Pin Functions

PIN		TYPE	DESCRIPTION
NAME	NO.		
1,2EN	1	I	Enable driver channels 1 and 2 (active high input)
<1:4>A	2, 7, 10, 15	I	Driver inputs, noninverting
<1:4>Y	3, 6, 11, 14	O	Driver outputs
3,4EN	9	I	Enable driver channels 3 and 4 (active high input)
GROUND	4, 5, 12, 13	—	Device ground and heat sink pin. Connect to printed-circuit-board ground plane with multiple solid vias
V_{CC1}	16	—	5-V supply for internal logic translation
V_{CC2}	8	—	Power VCC for drivers 4.5 V to 36 V

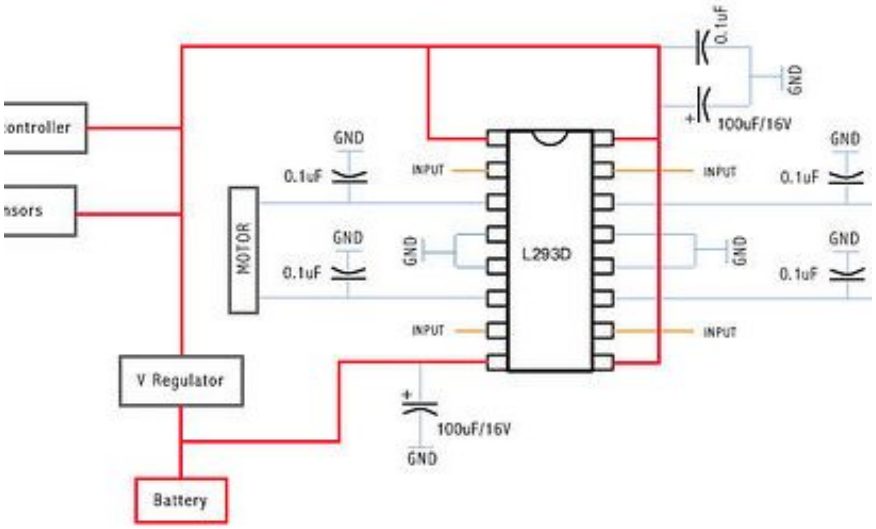
BASIC IMPLEMENTATION:

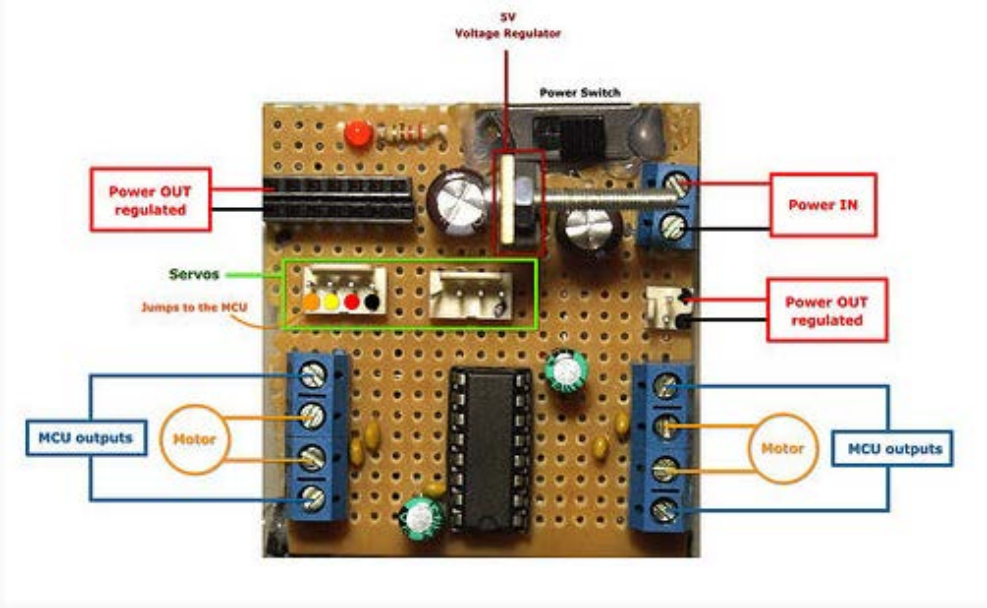


This is the most basic implementation of the chip.

As you can see, a 5V Voltage Regulator is between the battery and pins 1, 9, 16.
Pin 8 gets power before the VReg, if your motor needs for example 6V you should put 6V directly in this pin, all the other pins should not get more than 5V.

ADVANCED IMPLEMENTATION

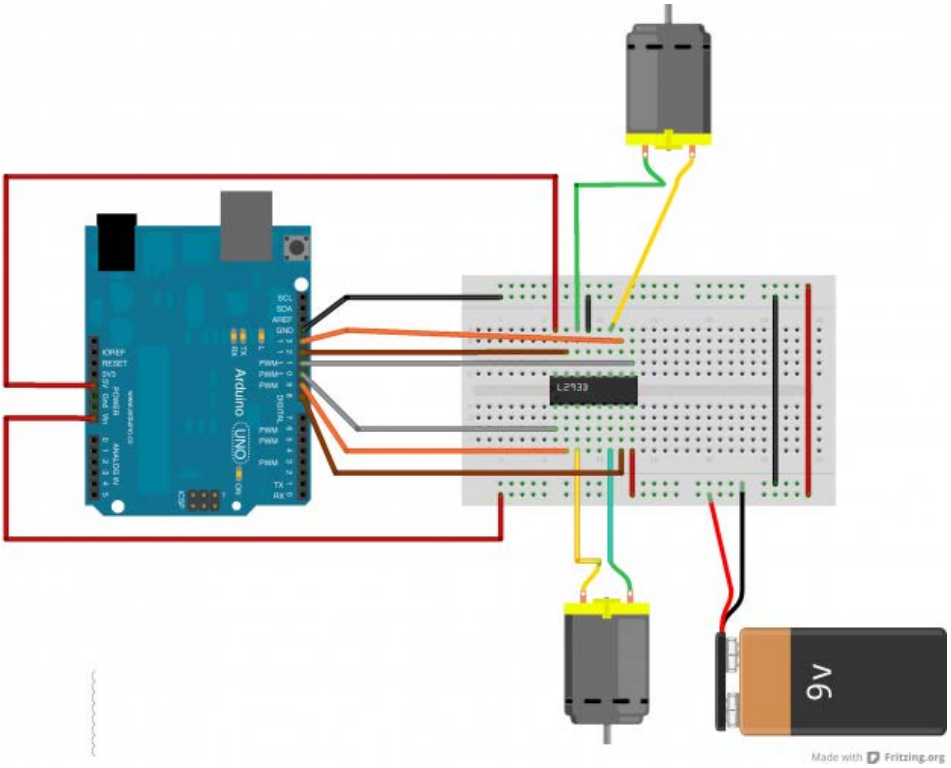




This is the correct Implementation (with the capacitors), and note that pin 8 is feeded by unregulated voltage. This means that if your motors need more than 5V, you should power this pin with that amount of voltage, and the rest of the circuit with 5V.

ARDUINO CODE

Schematic:



```
// Use this code to test your motor with the Arduino board:


// ---------------------------------------------------------------------------- Motors
#define E1 10  // Enable Pin for motor 1
#define E2 11  // Enable Pin for motor 2
#define I1 8  // Control pin 1 for motor 1
#define I2 9  // Control pin 2 for motor 1
#define I3 12  // Control pin 1 for motor 2
#define I4 13  // Control pin 2 for motor 2
// ---------------------------------------------------------------------------- Setup
void setup() {
pinMode(E1, OUTPUT);
pinMode(E2, OUTPUT);
pinMode(I1, OUTPUT);
pinMode(I2, OUTPUT);
pinMode(I3, OUTPUT);
pinMode(I4, OUTPUT);
}



// ---------------------------------------------------------------------------- Loop
void loop() {

drive_forward();
delay(1000);
motor_stop();
Serial.println("1");

drive_backward();
delay(1000);
motor_stop();
Serial.println("2");

turn_left();
delay(1000);
motor_stop();
Serial.println("3");

turn_right();
delay(1000);
```

```
motor_stop();
Serial.println("4");

motor_stop();
delay(1000);
motor_stop();
Serial.println("5");
}
// ------------------------------------------------------------------------- Drive

void motor_stop(){
analogWrite(E1, 0);
analogWrite(E2, 0);

delay(25);
}

void drive_forward(){


analogWrite(E1, 255); // Run in full speed
analogWrite(E2, 255); // Run in full speed
digitalWrite(I1, HIGH);
digitalWrite(I2, LOW);
digitalWrite(I3, HIGH);
digitalWrite(I4, LOW);
}
void drive_backward(){
analogWrite(E1, 255);  // Run in full speed
analogWrite(E2, 255);  // Run in full speed
digitalWrite(I1, LOW);
digitalWrite(I2, HIGH);
digitalWrite(I3, LOW);
digitalWrite(I4, HIGH);
delay(10000);
}

void turn_left(){
analogWrite(E1, 127); // Run at a slower speed
analogWrite(E2, 255); // Run in full speed
digitalWrite(I1, HIGH);
digitalWrite(I2, LOW);
```

```
digitalWrite(I3, HIGH);
digitalWrite(I4, LOW);
delay(10000);
}

void turn_right(){
analogWrite(E2, 127); // Run at a slower speed
analogWrite(E1, 255); // Run in full speed
digitalWrite(I1, HIGH);
digitalWrite(I2, LOW);
digitalWrite(I3, HIGH);
digitalWrite(I4, LOW);
delay(10000);
}
```