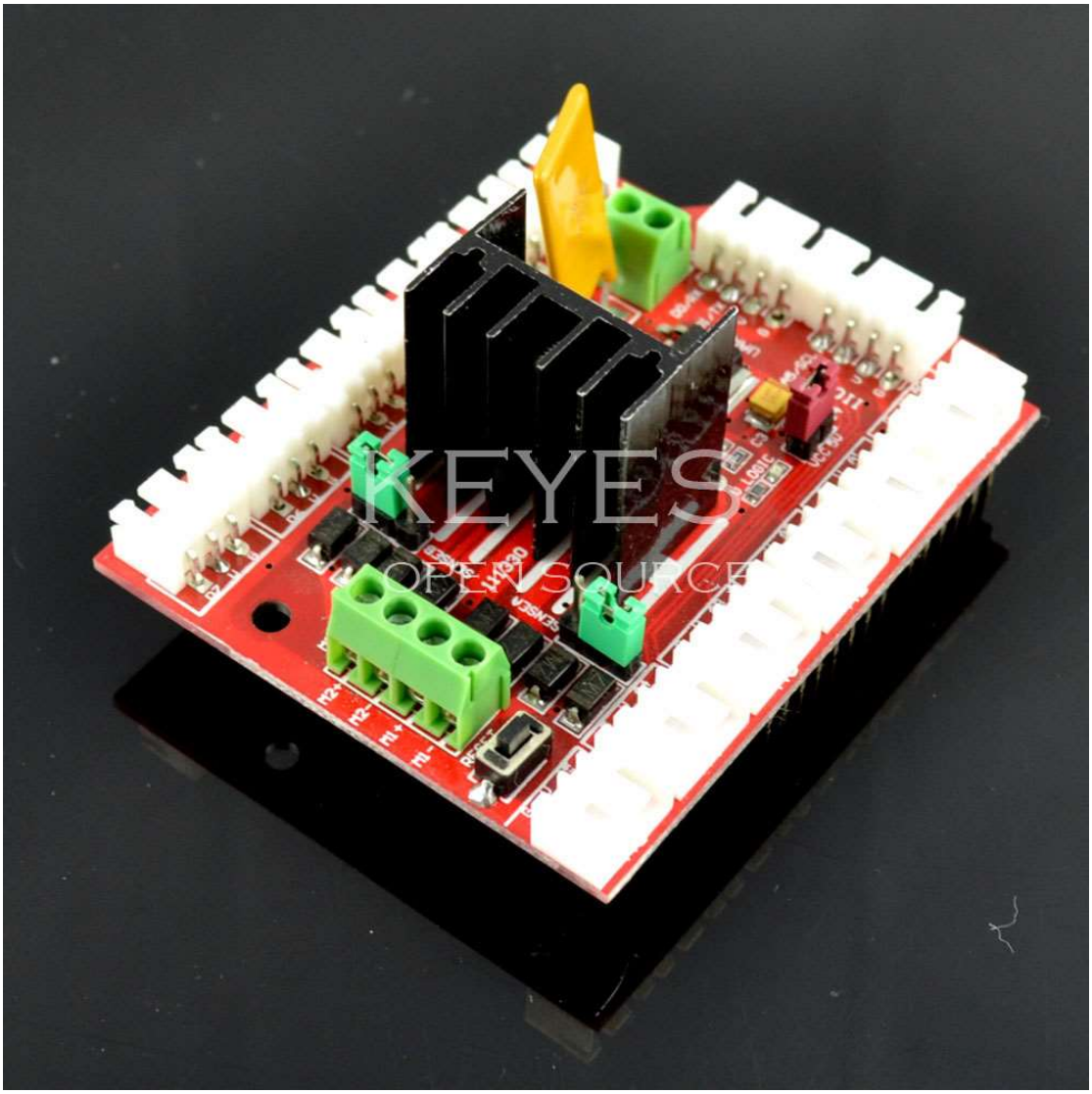
Keyes L298N Motor Shield

Introduction

The Motor Shield is a perfect platform for robotics and mechanical applications. It enables the Arduino to drive two brushed DC motors or one 4-wire two-phase stepper motor. Based on the H-bridge driver Chip L298N motor driver integrated circuit, it requires a 6V to 15V power supply to power the motor and also includes an on-board 5V voltage regulator for powering the main Arduino board. Additional plug and play 2.00mm spacing Grove sensors can be connected to the 13 on-board Grove connectors.



Features

Standard Arduino compatible

Pulse-width modulated speed control mode

4 direction indicator lights

Compatible with 2.00mm spacing Grove plug and play sensors

Extra large heat sink helps handle big loads

Supports up to 14 servos

CAUTION:

The Driver IC and Heat sink may become very hot when working with current more than 1000mA.

Specifications

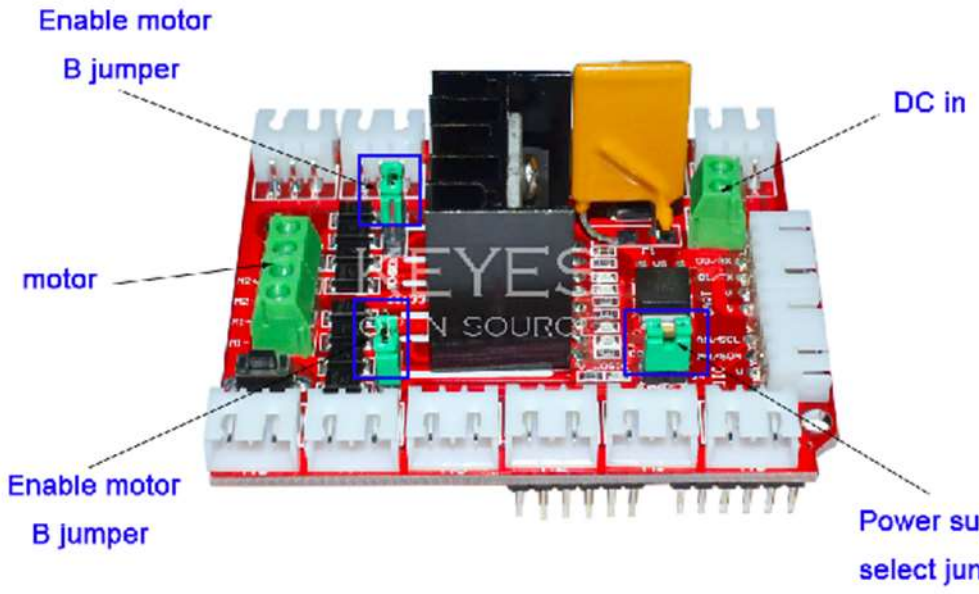
Item	Min	Typical	Max	Unit
Logic Control Voltage	4.5	5	5.5	V
Motor Supply Voltage	6	/	15	V
Output Voltage	0	/	Vinput -1	V
Output Current(For Each Channel)	/	/	2000 *	mA
Output Duty range	0%~100%			/
Dimension	68.5x54.5x29.5			mm
Net Weight	37			g

* Recommend maximum duty <50% at full load

Interface Function

Pin Name	Direction	Connection to Arduino	Description
VCC	/	VCC	Power supply selector
VS, GND	/	/	Power Supply for Motor, 6V - 15V
EA	Input	D9	TTL Compatible Enable Input of Bridge A
EB	Input	D10	TTL Compatible Enable Input of Bridge B
IN1	Input	D8	TTL Compatible Inputs of the Bridge A
IN2	Input	D11	TTL Compatible Inputs of the Bridge A
IN3	Input	D12	TTL Compatible Inputs of the Bridge B
IN4	Input	D13	TTL Compatible Inputs of the Bridge B
M1-, M1+	Output	/	Outputs of the Bridge A
M2-, M2+	Output	/	Outputs of the Bridge B

Usage



Enable Motor B jumper: Connect above two interfaces with a jumper cap when driving the DC motor A.

Enable Motor A jumper: Connect below two interfaces with a jumper cap when driving the DC motor B.

Power supply select jumper: Connect with a jumper cap, Arduino can be powered by the drive voltage via a on-board voltage regulator, which regulate the drive voltage to 5v.

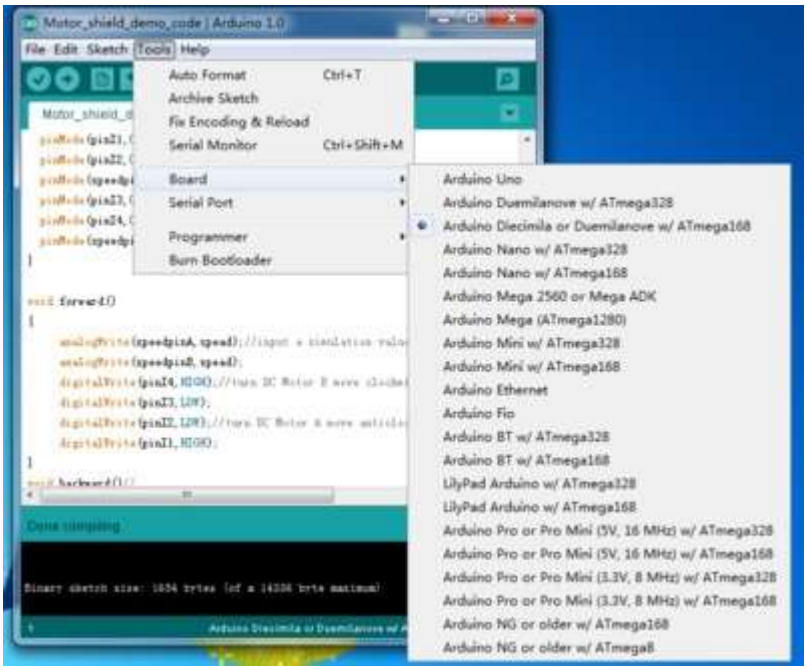
Hardware Installation

Connect DC motor to the motor shield Output Pins M1+& M1-(M2+& M2-), if using a 4-wire stepper motor, make sure the 4 Pins are correctly connected. And connect the drive voltage (The voltage needed is upon the motor used, Refer to the motor datasheet) to the Power supply terminals.

As the jumper J4 inserted, Arduino can be powered by the drive voltage via a on-board voltage regulator, which regulate the drive voltage to 5v.

Software:

Select the corresponding Arduino board in tools-boards and serial port in tools-serial port.



Upload the sketch to your Arduino board, then you would find the 2 motors begin to work. If you power the motor shield via the power terminal and the power jumper J4 was inserted, you can remove the USB cable now. Speed control is achieved through conventional PWM which can be obtained from Arduino's PWM output D9(EA) and D10(EB). Using the function analogWrite() to generate the drive PWM:

```
int speedpinA=9;//enable motor A
int speedpinB=10;//enable motor B
int spead =127;//define the spead of motor
      ......
analogWrite(speedpinA,spead);//AnalogWrite to Generate PWM to control the motor speed
analogWrite(speedpinB,spead);
```

And Set the Digital D8(IN1) and D11(IN2) to control the motor attached to OUT1/2, while digital D12(IN3) and D13(IN4) to control motor attached to OUT3/4.

```
int pinI1=8;//define I1 interface
int pinI2=11;//define I2 interface
      ......
digitalWrite(pinI2,HIGH);//turn DC Motor A move clockwise
digitalWrite(pinI1,LOW);
```

EA(B)	IN1(IN3)	IN2(IN4)	Motion of MotorA(B)
0	x	x	Stop
1	0	0	Stop

1	0	1	Clockwise
1	1	0	Anticlockwise
1	1	1	Stop

L298N Motor Shield DEMO CODE WITH ARDUINO:

```
int pinI1=8;//define I1 interface
int pinI2=11;//define I2 interface
int speedpinA=9;//enable motor A
int pinI3=12;//define I3 interface
int pinI4=13;//define I4 interface
int speedpinB=10;//enable motor B
int spead =127;//define the spead of motor

void setup()
{
  pinMode(pinI1,OUTPUT);
  pinMode(pinI2,OUTPUT);
  pinMode(speedpinA,OUTPUT);
  pinMode(pinI3,OUTPUT);
  pinMode(pinI4,OUTPUT);
  pinMode(speedpinB,OUTPUT);
}

void forward()
{
      analogWrite(speedpinA,spead);//input a simulation value to set the speed
      analogWrite(speedpinB,spead);
      digitalWrite(pinI4,HIGH);//turn DC Motor B move clockwise
      digitalWrite(pinI3,LOW);
      digitalWrite(pinI2,LOW);//turn DC Motor A move anticlockwise
      digitalWrite(pinI1,HIGH);
}
void backward()//
{
      analogWrite(speedpinA,spead);//input a simulation value to set the speed
      analogWrite(speedpinB,spead);
      digitalWrite(pinI4,LOW);//turn DC Motor B move anticlockwise
      digitalWrite(pinI3,HIGH);
      digitalWrite(pinI2,HIGH);//turn DC Motor A move clockwise
      digitalWrite(pinI1,LOW);
}
void left()//
{
      analogWrite(speedpinA,spead);//input a simulation value to set the speed
      analogWrite(speedpinB,spead);
      digitalWrite(pinI4,HIGH);//turn DC Motor B move clockwise
      digitalWrite(pinI3,LOW);
```

```
        digitalWrite(pinI2,HIGH);//turn DC Motor A move clockwise
        digitalWrite(pinI1,LOW);
}
void right()//
{
        analogWrite(speedpinA,spead);//input a simulation value to set the speed
        analogWrite(speedpinB,spead);
        digitalWrite(pinI4,LOW);//turn DC Motor B move anticlockwise
        digitalWrite(pinI3,HIGH);
        digitalWrite(pinI2,LOW);//turn DC Motor A move clockwise
        digitalWrite(pinI1,HIGH);
}
void stop()//
{
        digitalWrite(speedpinA,LOW);// Unenble the pin, to stop the motor. this should be done to
avid damaging the motor.
        digitalWrite(speedpinB,LOW);
        delay(1000);

}

void loop()
{
   left();
   delay(2000);
   stop();
   right();
   delay(2000);
   stop();
  // delay(2000);
   forward();
   delay(2000);
   stop();
   backward();
   delay(2000);
   stop();
}
```

****

Follows the logic between EA(B) and INx with motor motion:

```
/*
Stepper Motor Control - one revolution

This program drives a unipolar or bipolar stepper motor
  by using the included Stepper library of the Arduino.
 The digital pins 8,11,12,13 drive the L298N and are used when creating the stepper object
  Digital pins 9 and 10 must be high to enable the chip.
   The motor should revolve one revolution in one direction, then
  one revolution in the other direction.
```

```
 */

#include <Stepper.h>

const int stepsPerRevolution = 200;    // change this to fit the number of steps per revolution
// for your motor

// initialize the stepper library on pins 8 through 11:
Stepper myStepper(stepsPerRevolution, 8,11,12,13);

void setup() {
   // set the speed at 60 rpm:
   myStepper.setSpeed(60);
   // initialize the serial port:
   Serial.begin(9600);
   pinMode(9,OUTPUT);
   pinMode(10,OUTPUT);
   digitalWrite(9,HIGH);
   digitalWrite(10,HIGH);
}

void loop() {
   // step one revolution    in one direction:
   Serial.println("clockwise");
   myStepper.step(stepsPerRevolution);
   delay(500);

step one revolution in the other direction:
   Serial.println("counterclockwise");
   myStepper.step(-stepsPerRevolution);
   delay(500);
}
```