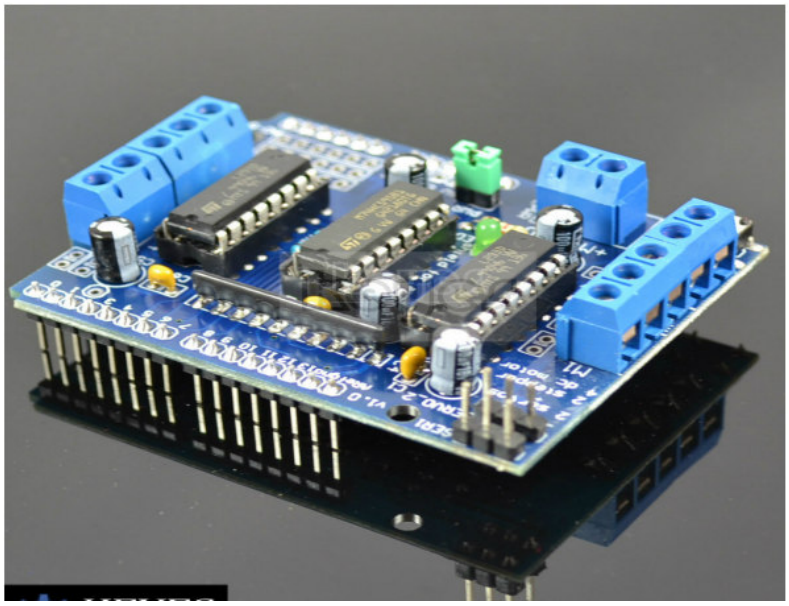
L293D motor control shield



L293D is a monolithic integrated, high voltage, high current, 4-channel driver. Basically this means using this chip you can drive DC motors with power supplier up to 36 Volts, and the chip can supply a maximum current of 600mA per channel. L293D chip is also known as a type of H-Bridge. The H-Bridge is typically an electrical circuit that enables a voltage to be applied across a load in either direction to an output, e.g. motor.

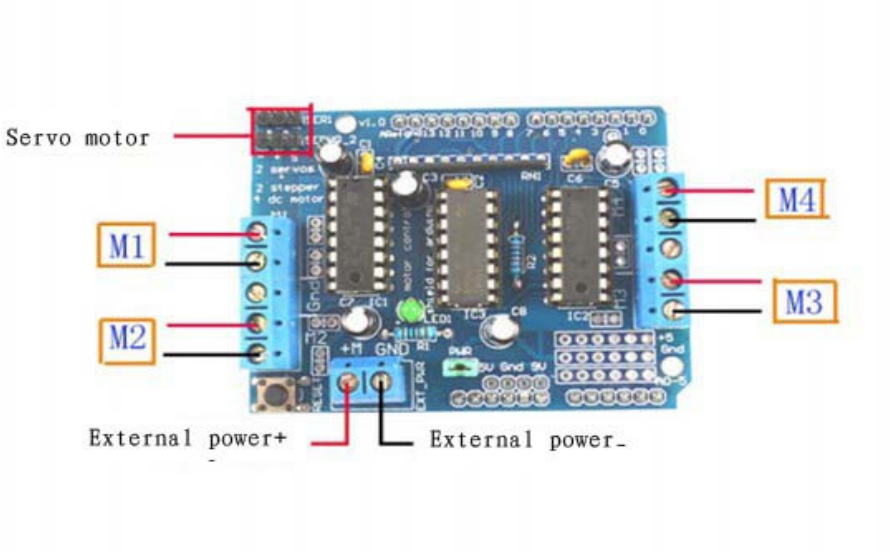
Features:

- 2 connections for 5V 'hobby' servos connected to the Arduino's high-resolution dedicated timer - no jitter!
- Up to 4 bi-directional DC motors with individual 8-bit speed selection (so, about 0.5% resolution)
- Up to 2 stepper motors (unipolar or bipolar) with single coil, double coil, interleaved or micro-stepping.
- 4 H-Bridges: L293D chipset provides 0.6A per bridge (1.2A peak) with thermal shutdown protection, 4.5V to12V
- Pull down resistors keep motors disabled during power-up
- Big terminal block connectors to easily hook up wires (10-22AWG) and power
- Arduino reset button brought up top
- 2-pin terminal block to connect external power, for separate logic/motor supplies
- Tested compatible with Mega, UNO& Duemilanove
- Dimensions: 69mm x 53mm x 14.3mm (2.7in x 2.1in x 0.6in)

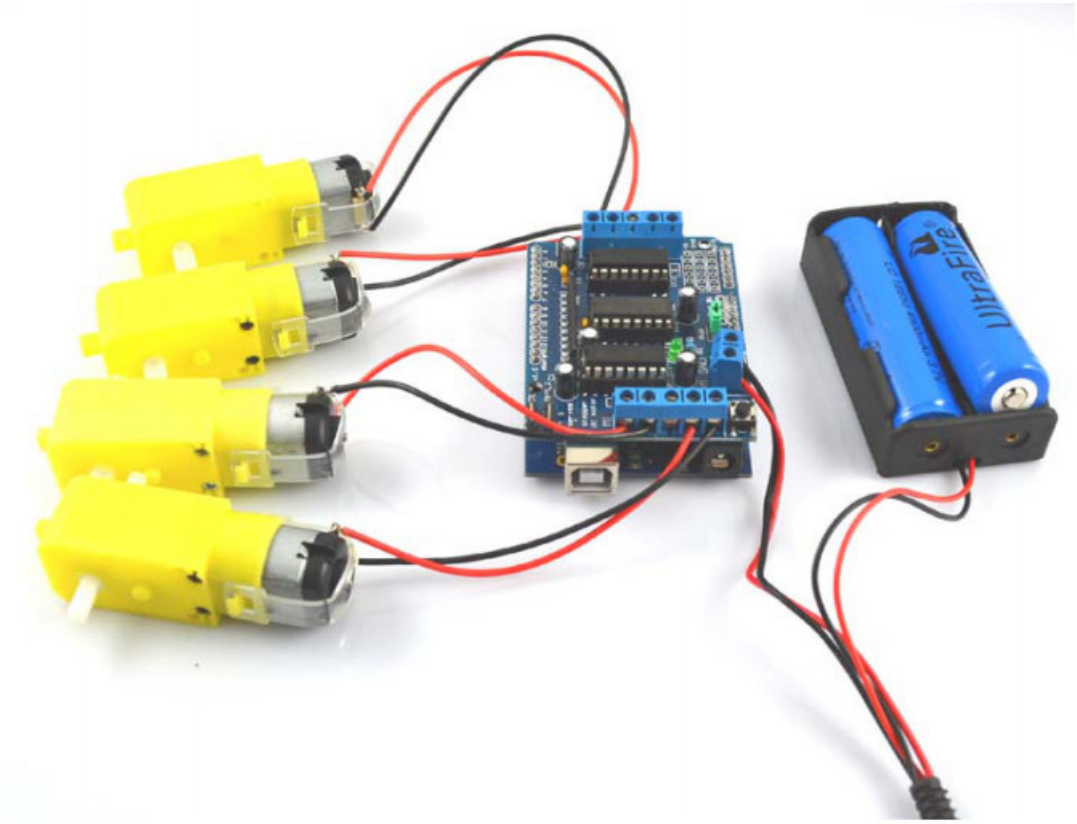
Operation：

Arduino controller: 1pcs
L293D: 1pcs
DC motor: 4 pcs
Power supplier 9V: 1pcs

Please connect the devices according to the following drawing:



Drawing



Program source code is as follows：

```
#include <Servo.h>
#define MOTORLATCH 12
#define MOTORCLK 4
#define MOTORENABLE 7
#define MOTORDATA 8
#define MOTOR1_A 2
#define MOTOR1_B 3
#define MOTOR2_A 1
#define MOTOR2_B 4
#define MOTOR3_A 5
#define MOTOR3_B 7
#define MOTOR4_A 0
#define MOTOR4_B 6
#define MOTOR1_PWM 11
#define MOTOR2_PWM 3
#define MOTOR3_PWM 6
#define MOTOR4_PWM 5
#define SERVO1_PWM 10
#define SERVO2_PWM 9
#define FORWARD 1
#define BACKWARD 2
#define BRAKE 3
#define RELEASE 4
Servo servo_1;
Servo servo_2;
void setup()
{
Serial.begin(9600);
Serial.println("Simple Adafruit Motor Shield sketch");
servo_1.attach(SERVO1_PWM);
servo_2.attach(SERVO2_PWM);
}
void loop()
{
motor(1, FORWARD, 255);
motor(2, FORWARD, 255);
motor(3, FORWARD, 255);
motor(4, FORWARD, 255);
delay(2000);
// Be friendly to the motor: stop it before reverse.
motor(1, RELEASE, 0);
motor(2, RELEASE, 0);
```

```
motor(3, RELEASE, 0);
motor(4, RELEASE, 0);
delay(100);
motor(1, BACKWARD, 128);
motor(2, BACKWARD, 128);
motor(3, BACKWARD, 128);
motor(4, BACKWARD, 128);
delay(2000);
motor(1, RELEASE, 0);
motor(2, RELEASE, 0);
motor(3, RELEASE, 0);
motor(4, RELEASE, 0);
delay(100);
}
void motor(int nMotor, int command, int speed)
{
int motorA, motorB;
if (nMotor >= 1 && nMotor <= 4)
{
switch (nMotor)
{
case 1:
motorA = MOTOR1_A;
motorB = MOTOR1_B;
break;
case 2:
motorA = MOTOR2_A;
motorB = MOTOR2_B;
break;
case 3:
motorA = MOTOR3_A;
motorB = MOTOR3_B;
break;
case 4:
motorA = MOTOR4_A;
motorB = MOTOR4_B;
break;
default:
break;
}
switch (command)
{
case FORWARD:
motor_output (motorA, HIGH, speed);
```

```
motor_output (motorB, LOW, -1); // -1: no PWM set
break;
case BACKWARD:
motor_output (motorA, LOW, speed);
motor_output (motorB, HIGH, -1); // -1: no PWM set
break;
case BRAKE:
motor_output (motorA, LOW, 255); // 255: fully on.
motor_output (motorB, LOW, -1); // -1: no PWM set
break;
case RELEASE:
motor_output (motorA, LOW, 0); // 0: output floating.
motor_output (motorB, LOW, -1); // -1: no PWM set
break;
default:
break;
}
}
}
void motor_output (int output, int high_low, int speed)
{
int motorPWM;
switch (output)
{
case MOTOR1_A:
case MOTOR1_B:
motorPWM = MOTOR1_PWM;
break;
case MOTOR2_A:
case MOTOR2_B:
motorPWM = MOTOR2_PWM;
break;
case MOTOR3_A:
case MOTOR3_B:
motorPWM = MOTOR3_PWM;
break;
case MOTOR4_A:
case MOTOR4_B:
motorPWM = MOTOR4_PWM;
break;
default:
speed = -3333;
break;
}
```

```
if (speed != -3333)
{
shiftWrite(output, high_low);
// set PWM only if it is valid
if (speed >= 0 && speed <= 255)
{
analogWrite(motorPWM, speed);
}
}
}
void shiftWrite(int output, int high_low)
{
static int latch_copy;
static int shift_register_initialized = false;
// Do the initialization on the fly,
// at the first time it is used.
if (!shift_register_initialized)
{
// Set pins for shift register to output
pinMode(MOTORLATCH, OUTPUT);
pinMode(MOTORENABLE, OUTPUT);
pinMode(MOTORDATA, OUTPUT);
pinMode(MOTORCLK, OUTPUT);
// Set pins for shift register to default value (low);
digitalWrite(MOTORDATA, LOW);
digitalWrite(MOTORLATCH, LOW);
digitalWrite(MOTORCLK, LOW);
// Enable the shift register, set Enable pin Low.
digitalWrite(MOTORENABLE, LOW);
// start with all outputs (of the shift register) low
latch_copy = 0;
shift_register_initialized = true;
}
// The defines HIGH and LOW are 1 and 0.
// So this is valid.
bitWrite(latch_copy, output, high_low);
shiftOut(MOTORDATA, MOTORCLK, MSBFIRST, latch_copy);
delayMicroseconds(5); // For safety, not really needed.
digitalWrite(MOTORLATCH, HIGH);
delayMicroseconds(5); // For safety, not really needed.
digitalWrite(MOTORLATCH, LOW);
}
```