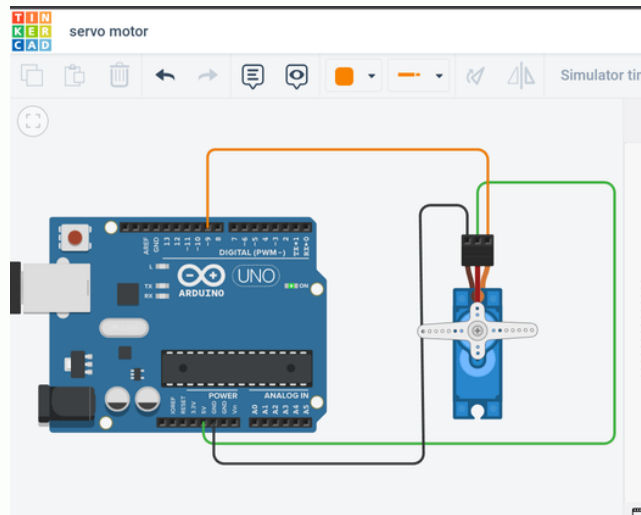


SERVO MOTOR

Connecting



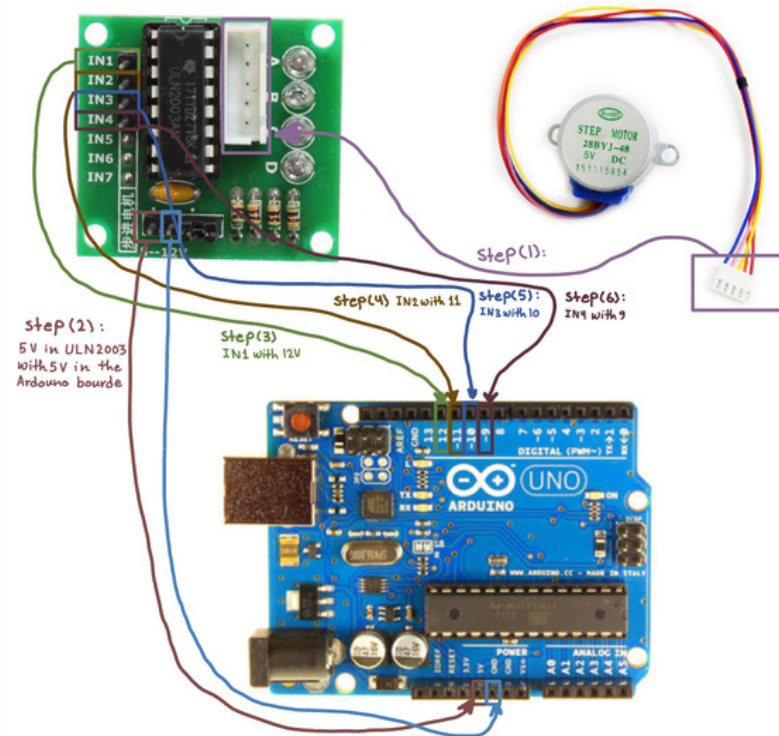
Code

```
1  #include <Servo.h>
2  Servo servomotor;
3  int base = 0;
4  void setup() {
5    servomotor.attach(9);
6  }
7  void loop() {
8    for (base = 0; base <= 180; base += 1) {
9      servomotor.write(base);
10     delay(15);
11   }
12   for (base = 180; base >= 0; base -= 1) {
13     servomotor.write(base);
14     delay(15);
15   }
16 }
```

STEPPER MOTOR

motor "Driver"

Connecting

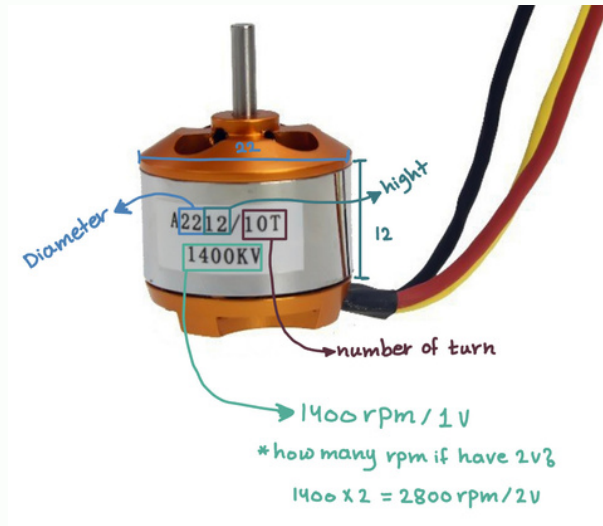


Code

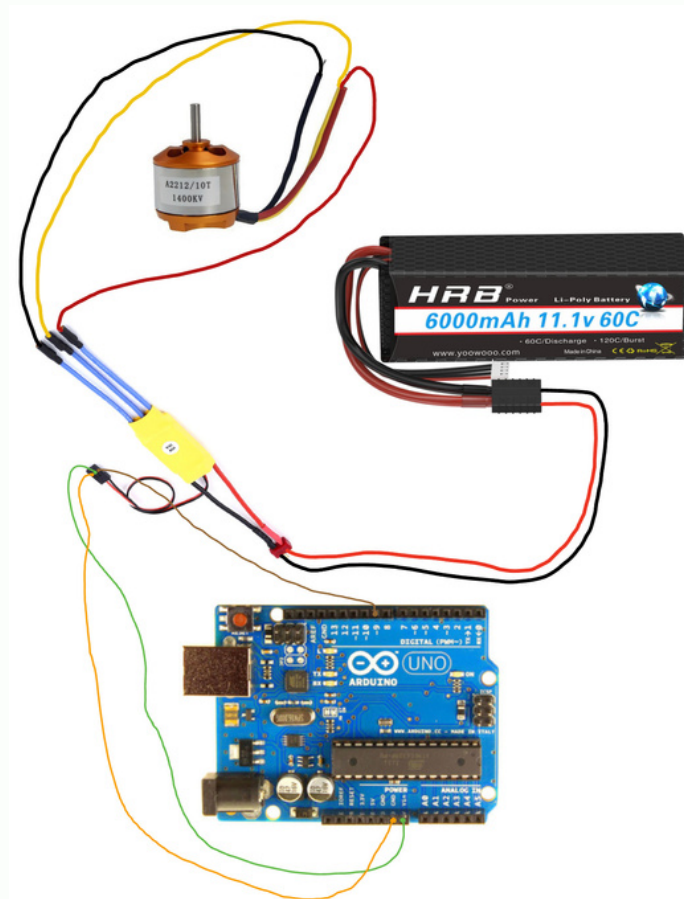
```
1  #include <Stepper.h>
2  int numberofstep =2038;
3  byte IN1=12;
4  byte IN3=10;
5  byte IN2=11;
6  byte IN4=9;
7  Stepper stepper (numberofstep, IN1, IN3, IN2, IN4);
8  void setup()
9  {
10
11 }
12 void loop()
13 {
14     stepper.setSpeed(4);
15     stepper.step(numberofstep);
16     delay(1000);
17     stepper.setSpeed(4);
18     stepper.step(- numberofstep);
19     delay(1000);
20 }
```

BRUSHLESS MOTOR

Information about brushless motor



electronic circuit



BRUSHLESS MOTOR

algorithm

To run the tensioner we need

- Brushless motor
- Electrical speed control (ESC)
- Battery

Step 1: in the brushless motor three wires connect it with (ESC)

-If you want the movement to be with the clockwise, combine the red with the red and the black with the black

-If you want the movement to be counterclockwise, reverse the wires by connecting the red with the black

Step 2 : Connect the battery with (ESC)

Step 3: The (ESC) contains three ports = Vcc, Ground, Input ... Connect it with the Arduino
- 9 , Vin , Gnd

Step 4: Code

```
#include <Servo.h>

#define MAX_SIGNAL 2000
#define MIN_SIGNAL 1000
#define MOTOR_PIN 9
int DELAY = 1000;

Servo motor;

void setup() {
  Serial.begin(9600);
  Serial.println("ELECTRONOBS ESC calibration...");
  Serial.println(" ");
  delay(1500);
  Serial.println("Program begin...");
  delay(1000);
  Serial.println("This program will start the ESC.");

  motor.attach(MOTOR_PIN);

  Serial.print("Now writing maximum output: ("); Serial.print(MAX_SIGNAL); Serial.print(" us in this case)"); Serial.print("\n");
  Serial.println("Turn on power source, then wait 2 seconds and press any key.");
  motor.writeMicroseconds(MAX_SIGNAL);
```

```

while (!Serial.available());
Serial.read();

// Send min output
Serial.println("\n");
Serial.println("\n");
Serial.print("Sending minimum output: (");Serial.print(MIN_SIGNAL);Serial.print(" us in this case)");Serial.print("\n");
motor.writeMicroseconds(MIN_SIGNAL);
Serial.println("The ESC is calibrated");
Serial.println("----");
Serial.println("Now, type a values between 1000 and 2000 and press enter");
Serial.println("and the motor will start rotating.");
Serial.println("Send 1000 to stop the motor and 2000 for full throttle");
}

void loop() {

if (Serial.available() > 0)
{
    int DELAY = Serial.parseInt();
    if (DELAY > 999)
    {

        motor.writeMicroseconds(DELAY);
        float SPEED = (DELAY-1000)/10;

```

```

        motor.writeMicroseconds(MIN_SIGNAL);
        Serial.println("The ESC is calibrated");
        Serial.println("----");
        Serial.println("Now, type a values between 1000 and 2000 and press enter");
        Serial.println("and the motor will start rotating.");
        Serial.println("Send 1000 to stop the motor and 2000 for full throttle");
    }
}

void loop() {

if (Serial.available() > 0)
{
    int DELAY = Serial.parseInt();
    if (DELAY > 999)
    {

        motor.writeMicroseconds(DELAY);
        float SPEED = (DELAY-1000)/10;
        Serial.print("\n");
        Serial.println("Motor speed:"); Serial.print(" "); Serial.print(SPEED); Serial.print("%");
    }
}
}

```