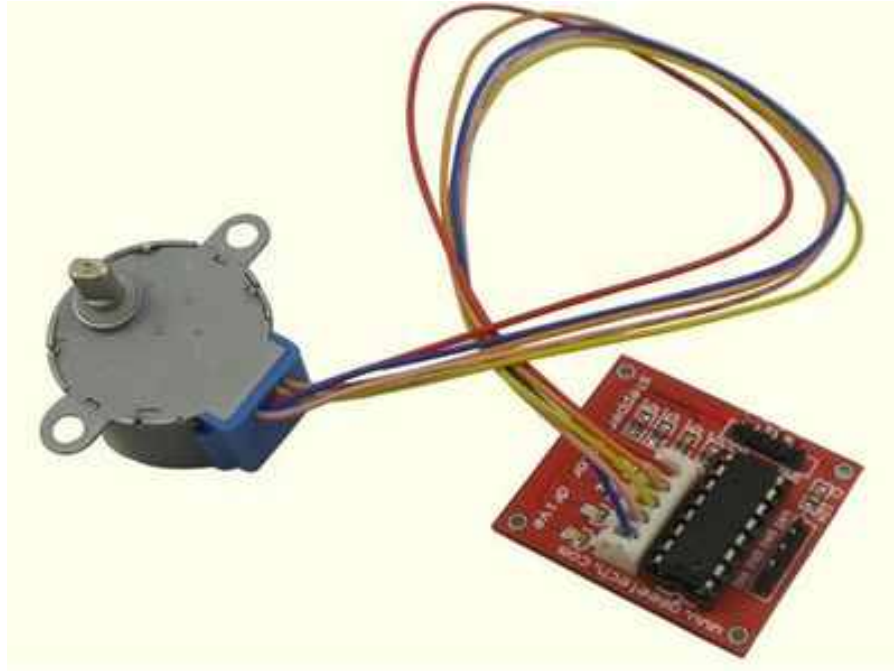


Stepper Motor Driver ULN2003



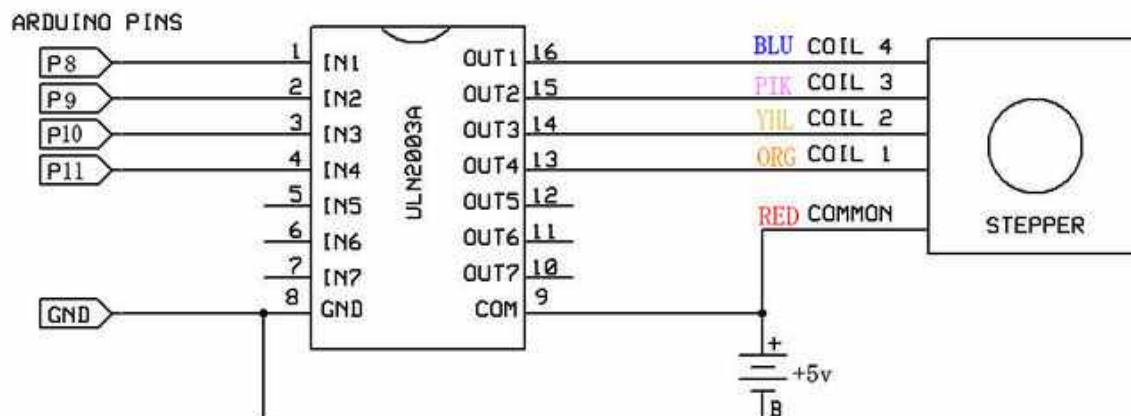
Description

The ULN2003A contains seven darlington transistor drivers and is somewhat like having seven TIP120 transistors all in one package. The ULN2003A can pass up to 500 mA per channel and has an internal voltage drop of about 1V when on. It also contains internal clamp diodes to dissipate voltage spikes when driving inductive loads. To control the stepper, apply voltage to each of the coils in a specific sequence.

The sequence would go like this:

Lead Wire Color	---> CW Direction (1-2 Phase)								
	1	2	3	4	5	6	7	8	
4 ORG	-	-							-
3 YEL		-	-	-					
2 PIK				-	-	-			
1 BLU						-	-	-	

Here are schematics showing how to interface a unipolar stepper motor to four controller pins using a ULN2003A, and showing how to interface using four TIP120's.



Arduino Example code

```
int Pin0 = 10;
int Pin1 = 11;
int Pin2 = 12;
int Pin3 = 13;
int _step = 0;
boolean dir = true; // gre
void setup()
{
  pinMode(Pin0, OUTPUT);
  pinMode(Pin1, OUTPUT);

```

```

pinMode(Pin2, OUTPUT);
pinMode(Pin3, OUTPUT);
}
void loop()
{
  switch(_step){
    case 0:
      digitalWrite(Pin0, LOW);
      digitalWrite(Pin1, LOW);
      digitalWrite(Pin2, LOW);
      digitalWrite(Pin3, HIGH);
      break;
    case 1:
      digitalWrite(Pin0, LOW);
      digitalWrite(Pin1, LOW);
      digitalWrite(Pin2, HIGH);
      digitalWrite(Pin3, HIGH);
      break;
    case 2:
      digitalWrite(Pin0, LOW);
      digitalWrite(Pin1, LOW);
      digitalWrite(Pin2, HIGH);
      digitalWrite(Pin3, LOW);
      break;
    case 3:
      digitalWrite(Pin0, LOW);
      digitalWrite(Pin1, HIGH);
      digitalWrite(Pin2, HIGH);
      digitalWrite(Pin3, LOW);
      break;
    case 4:
      digitalWrite(Pin0, LOW);
      digitalWrite(Pin1, HIGH);
      digitalWrite(Pin2, LOW);
      digitalWrite(Pin3, LOW);
      break;
    case 5:
      digitalWrite(Pin0, HIGH);
      digitalWrite(Pin1, HIGH);
      digitalWrite(Pin2, LOW);

```

```

        digitalWrite(Pin3, LOW);
    break;
    case 6:
        digitalWrite(Pin0, HIGH);
        digitalWrite(Pin1, LOW);
        digitalWrite(Pin2, LOW);
        digitalWrite(Pin3, LOW);
    break;
    case 7:
        digitalWrite(Pin0, HIGH);
        digitalWrite(Pin1, LOW);
        digitalWrite(Pin2, LOW);
        digitalWrite(Pin3, HIGH);
    break;
    default:
        digitalWrite(Pin0, LOW);
        digitalWrite(Pin1, LOW);
        digitalWrite(Pin2, LOW);
        digitalWrite(Pin3, LOW);
    break;
}
if(dir){
    _step++;
}else{
    _step--;
}
if(_step>7){
    _step=0;
}
if(_step<0){
    _step=7;
}
delay(1);
}

```

Arduino Example Code Notes :

1. The example code assumes that the stepper is being controlled by Arduino pins 8, 9, 10 and 11, but you can use any set of four pins.
2. The "#define STEPS 100" line defines the number of steps per rev. A 3.75 deg motor has 96 steps/rev while a 7.2 deg motor has 48 steps/rev.
3. The "Stepper stepper(STEPS, 8, 9, 10, 11)" line is where you enter the four pins used to control the stepper.
4. The "stepper.setSpeed(x)" command sets the motor speed to x rpm.
5. The "stepper.step(x)" command turns the motor x steps at the speed last set in the stepper.setSpeed() command. The motor turns one direction for positive x and the reverse direction for negative x.