

## Project 20: Dimmable Table Lamp

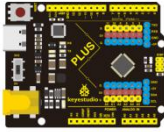


### 1. Project Introduction

A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. It works by varying the position of a sliding contact across a uniform resistance. In a potentiometer, the entire input voltage is applied across the whole length of the resistor, and the output voltage is the voltage drop between the fixed and sliding contact.

In this project, we are going to learn how to use Arduino to read the value of the potentiometer, and make a dimmable table lamp.

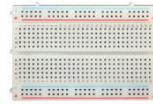
## 2. Project Hardware



Plus  
Development  
Board\*1



Plus Board  
Holder



400-Hole  
Breadboard



USB Cable\*1



Potentiometer  
\*1



Red M5 LED  
\*1



220 $\Omega$   
Resistor\*1

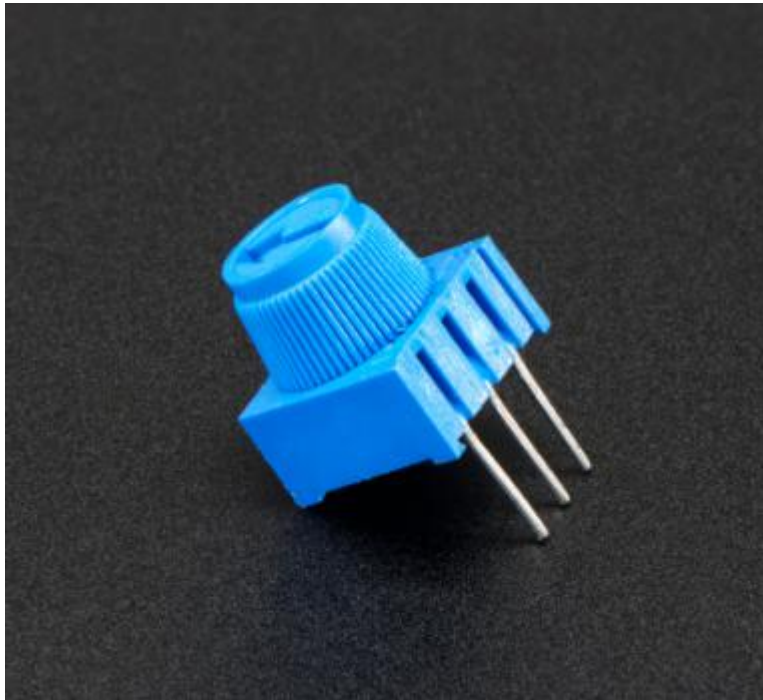


Jumper  
Wire\*6



Table Lamp  
Paper Card\*1

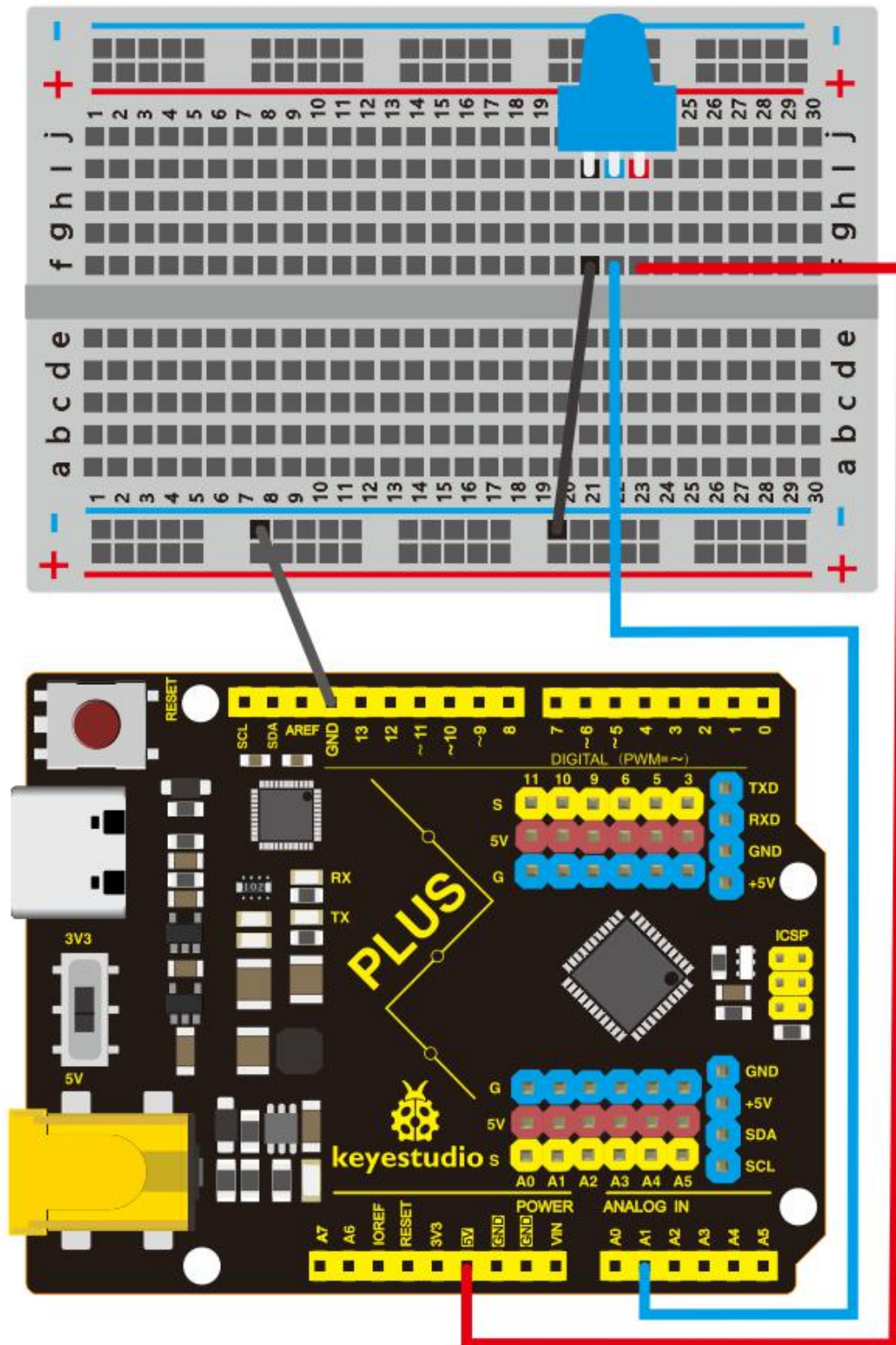
## 3. Potentiometer Features



Adjustable potentiometer is a kind of resistor and an analog electronic component, which has two states of 0 and 1 (high level and low level). The analog quantity is different, its data state presents a linear state such as 1 to 1000.

#### **4. Read Potentiometer Value**

We connect the Adjustable potentiometer to the analog pin of Arduino to read its value. Please refer to the following wiring diagram for wiring.



/\*

keyestudio STEM Starter Kit

## Project 20.1

### Read Potentiometer Value

<http://www.keyestudio.com>

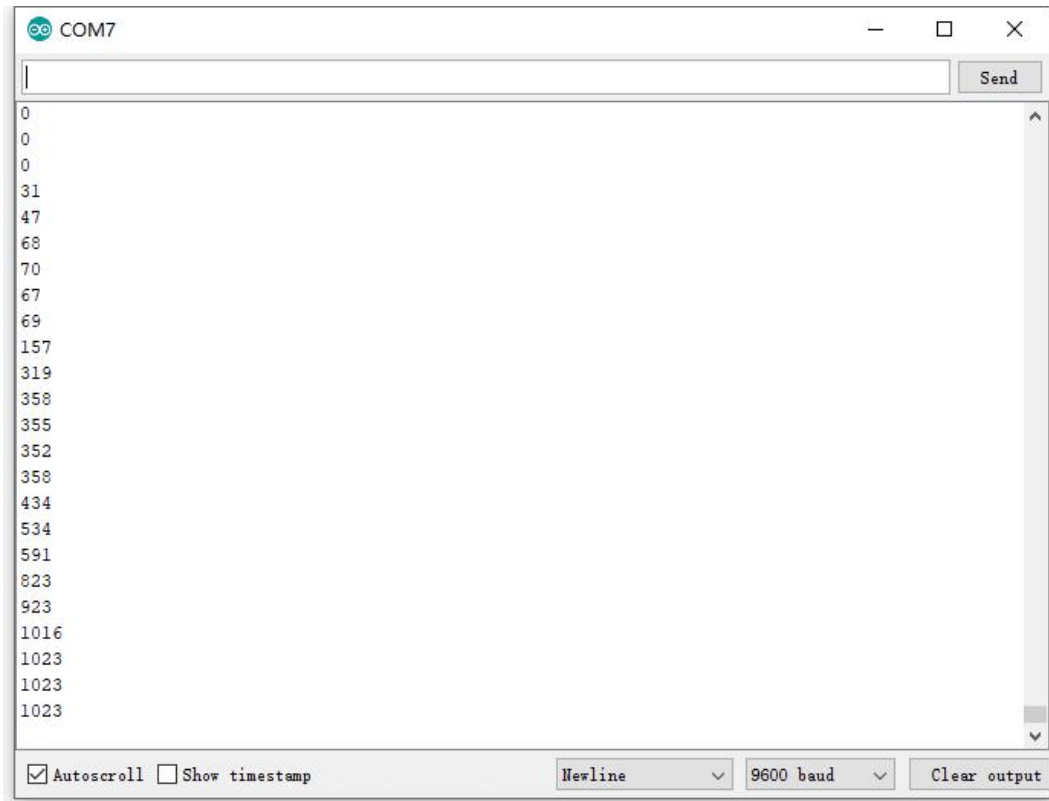
```
*/  
  
int potpin=A1;// initialize analog pin A1  
int val=0;// define val, assign initial value 0  
void setup()  
{  
  Serial.begin(9600);// set baud rate at 9600  
}  
void loop()  
{  
  val=analogRead(potpin);// read the analog value of analog  
  pin 1, and assign it to val  
  Serial.println(val);// display val's value  
}  
////////////////////////////////////
```

When you rotate the potentiometer knob, you can see the displayed value change. The reading of analog value is a very common function since most sensors output analog value.

After calculation, you can get the corresponding value you

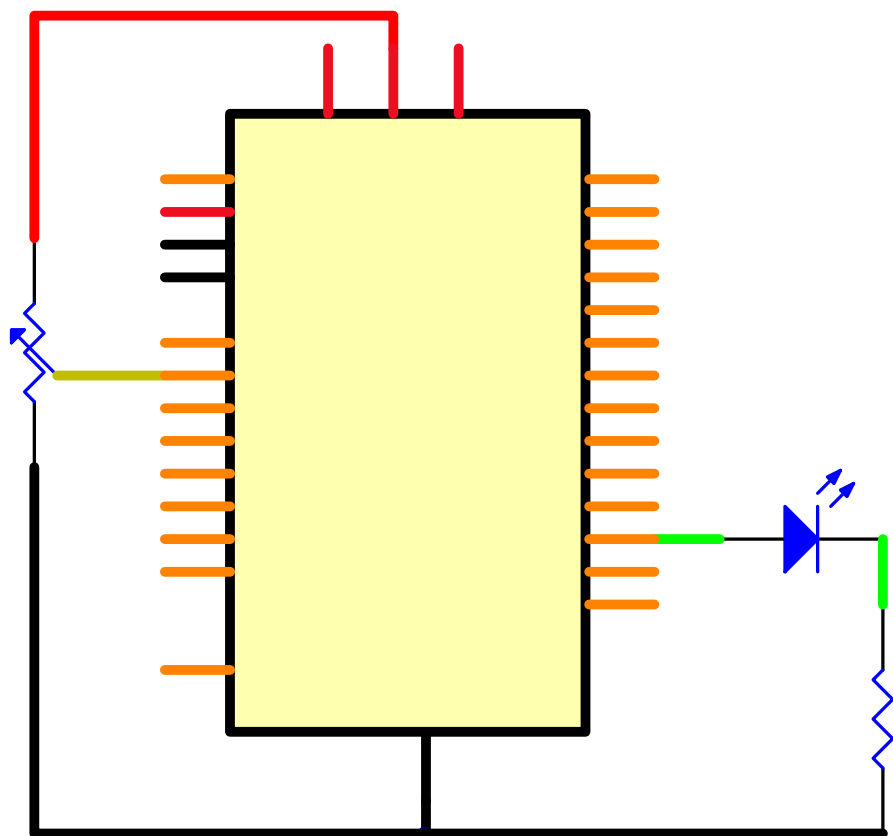
need.

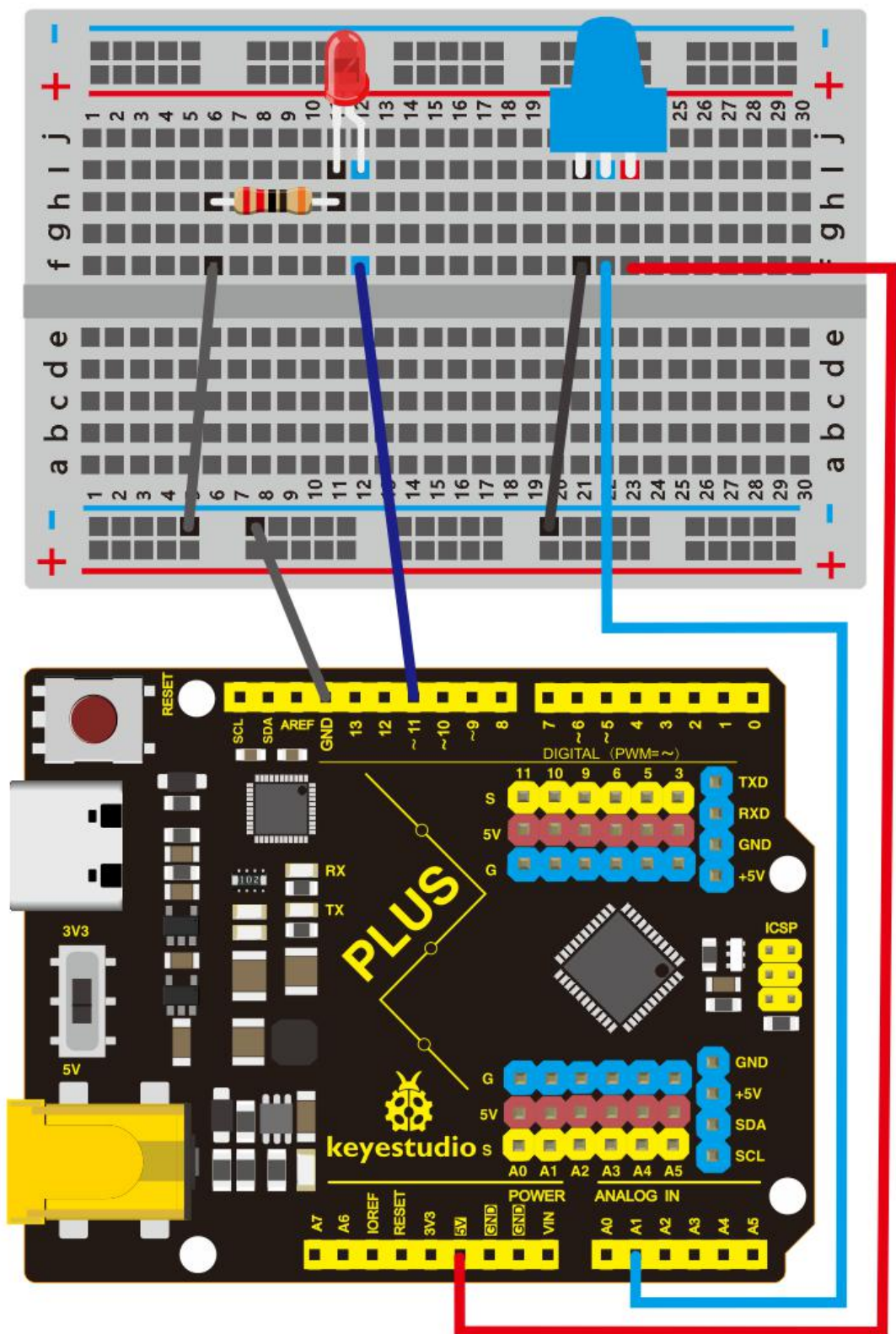
Below figure shows the analog value it reads.



## 5. Dimming Table Lamp Circuit Connection

In the last step, we read the value of the potentiometer, and now we need to convert the value of the potentiometer into the brightness of the LED to make a small desk lamp with adjustable brightness. See the wiring diagram.







## 6.Project Code

```
/*  
keyestudio STEM Starter Kit  
Project 20.2  
Dimming Table Lamp  
http://www.keyestudio.com  
*/  
  
int potpin=A1;// initialize analog pin A1  
int ledpin=11;// initialize digital pin 11  
int val=0;// define val, assign initial value 0  
  
void setup()  
{  
  pinMode(ledpin,OUTPUT);// set digital pin as "output"  
  Serial.begin(9600);// set baud rate at 9600  
}  
  
void loop()  
{  
  val=analogRead(potpin);// read the analog value of analog  
  pin 1, and assign it to val  
  analogWrite(ledpin,val/4);  
  Serial.println(val);// display val's value
```

}

//

## 7. Project Result

Put the lamp paper card on the potentiometer and the led.

Upload the code to the PLUS development board.

Open the serial monitor, set the baud rate to 9600, and the monitor will display the value of potentiometer.

When we turn the potentiometer, the brightness of the LED will change.

A model of a small desk lamp equipped with an adjustable brightness switch is completed.

