

Project 26: Spinning Ferris Wheel

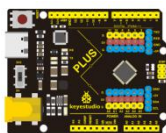


1. Project Introduction

Joystick is a component with two analog inputs and one digital input. It is widely used in game operation, robot control, drone control and other fields.

In this project, we use a joystick module and stepper motor to make a rotating ferris wheel. You can have a deeper understanding of the principle and operation of joystick in practice.

2. Project Hardware



Plus
Development



Plus Board
Holder



400-Hole
Breadboard



USB Cable*1

Board*1



Stepper

Motor*1



Stepper

Motor

driver*1



Joystick

Module*1



Jumper

Wire*10



Ferris Wheel

Paper Card*1

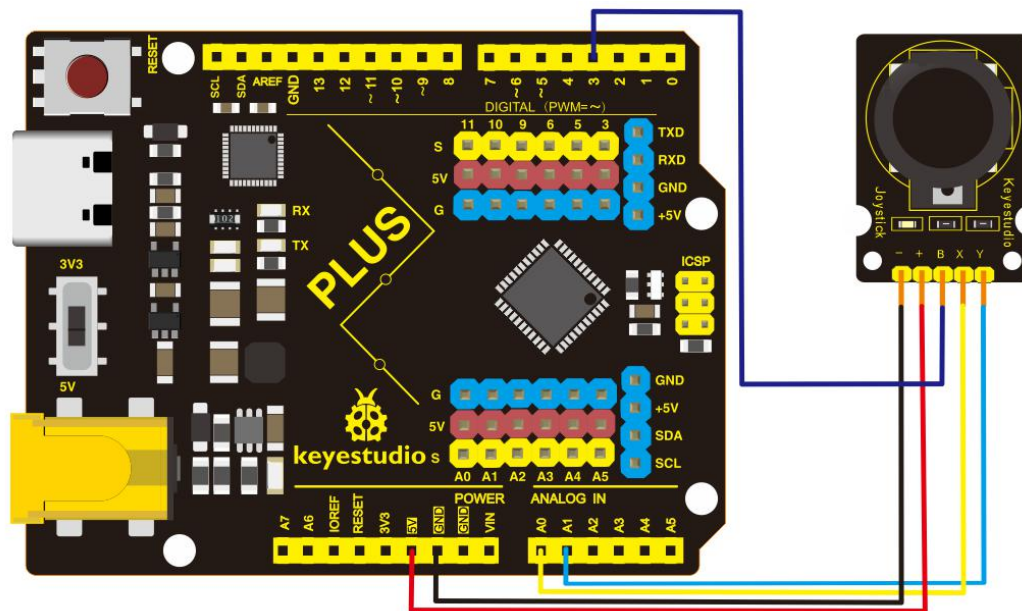
3. Joystick Module

Joystick module has 5 pins: Vcc, Ground, X, Y, Key. The thumbstick provides accurate readings. Additionally, you can press the joystick down to activate a 'press to select' push-button.



4. Read Joystick Module value

We have to use analog Arduino pins to read the data from the X/Y pins, and a digital pin to read the button. Please connect according to the wiring diagram below.



/*

keystudio STEM Starter Kit

Project 26.1

Read Joystick Module Value

<http://www.keyestudio.com>

```
*/
```

```
int VRx = A0;
```

```
int VRy = A1;
```

```
int SW = 3;
```

```
int xPosition = 0;
```

```
int yPosition = 0;
```

```
int SW_state = 0;
```

```
int mapX = 0;
```

```
int mapY = 0;
```

```
void setup() {
```

```
  Serial.begin(9600);
```

```
  pinMode(VRx, INPUT);
```

```
  pinMode(VRy, INPUT);
```

```
  pinMode(SW, INPUT_PULLUP);
```

```
}
```

```
void loop() {
```

```
  xPosition = analogRead(VRx);
```

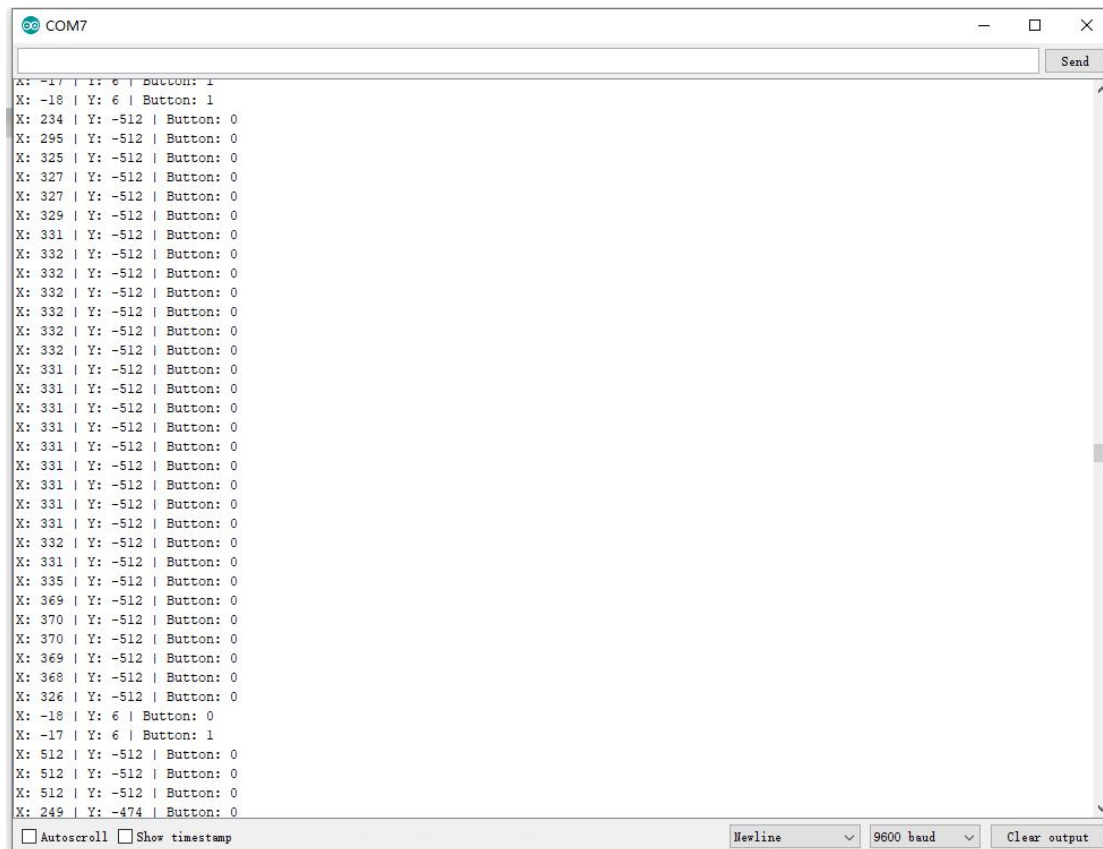
```
  yPosition = analogRead(VRy);
```

```
  SW_state = digitalRead(SW);
```

```
mapX = map(xPosition, 0, 1023, -512, 512);
mapY = map(yPosition, 0, 1023, -512, 512);
Serial.print("X: ");
Serial.print(mapX);
Serial.print(" | Y: ");
Serial.print(mapY);
Serial.print(" | Button: ");
Serial.println(SW_state);
delay(100);
}

/////////////////////////////////////////////////////////////////
/////////
```

Upload the code to Plus board. Then open the serial monitor and set the baud rate to 9600. You can see its value on the serial monitor when you shake the joystick, or press the button

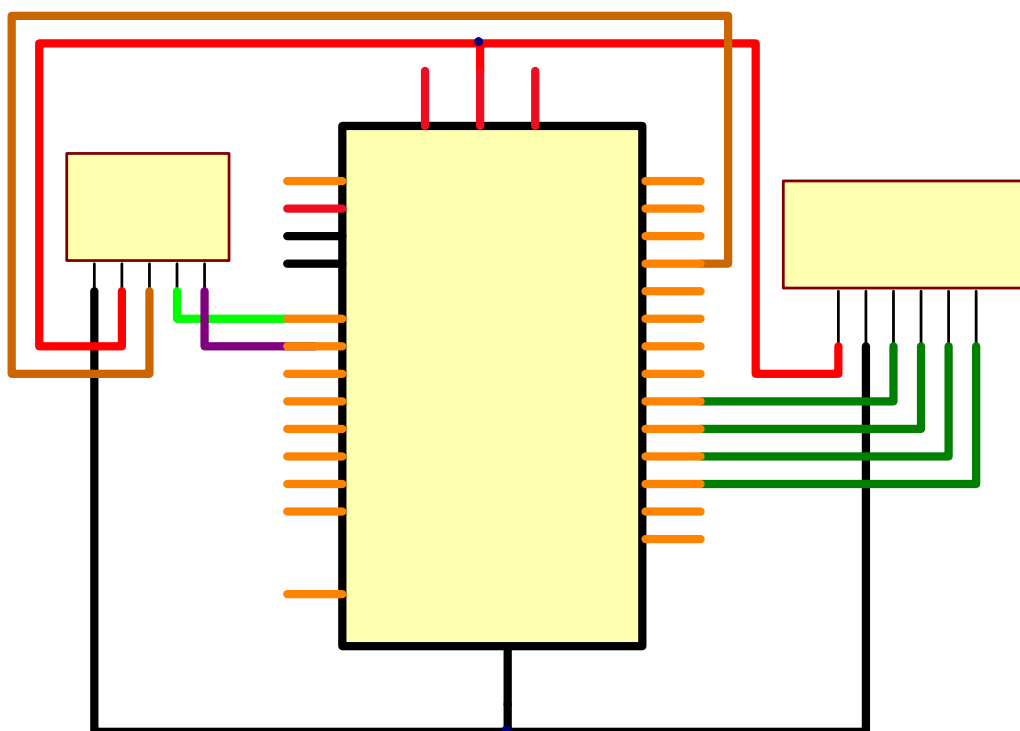


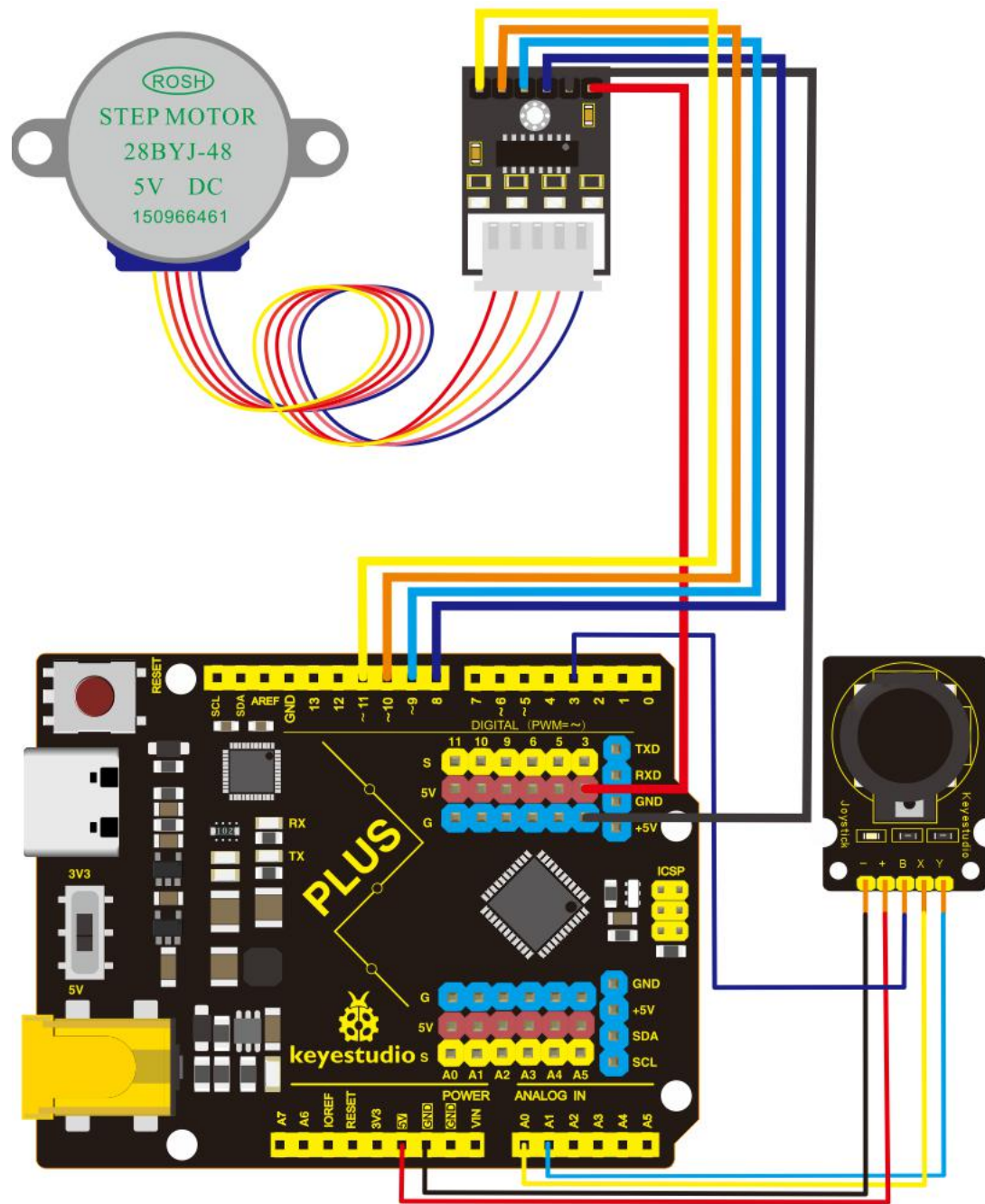
```
COM7
X: -17 | Y: 6 | Button: 1
X: -18 | Y: 6 | Button: 1
X: 234 | Y: -512 | Button: 0
X: 295 | Y: -512 | Button: 0
X: 325 | Y: -512 | Button: 0
X: 327 | Y: -512 | Button: 0
X: 327 | Y: -512 | Button: 0
X: 329 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 332 | Y: -512 | Button: 0
X: 332 | Y: -512 | Button: 0
X: 332 | Y: -512 | Button: 0
X: 332 | Y: -512 | Button: 0
X: 332 | Y: -512 | Button: 0
X: 332 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 332 | Y: -512 | Button: 0
X: 331 | Y: -512 | Button: 0
X: 335 | Y: -512 | Button: 0
X: 369 | Y: -512 | Button: 0
X: 370 | Y: -512 | Button: 0
X: 370 | Y: -512 | Button: 0
X: 369 | Y: -512 | Button: 0
X: 368 | Y: -512 | Button: 0
X: 326 | Y: -512 | Button: 0
X: -18 | Y: 6 | Button: 0
X: -17 | Y: 6 | Button: 1
X: 512 | Y: -512 | Button: 0
X: 512 | Y: -512 | Button: 0
X: 512 | Y: -512 | Button: 0
X: 249 | Y: -474 | Button: 0

☐ Autoscroll ☐ Show timestamp
Newline 9600 baud Clear output
```

5. Spinning ferris wheel Circuit Connection

We have just read the value of the joystick, here we need to use the joystick and stepper motor to do some things, connect according to the following figure.





6.Project Code

/*

keyestudio STEM Starter Kit

Project 26.2

Spinning ferris wheel

<http://www.keyestudio.com>

*/

const int X_pin = 0; // analog pin connected to X output

const int Y_pin = 1; // analog pin connected to Y output

int SW_pin = 3;

int X_Rotate;

int Y_Rotate;

// Stepper motor pin numbers

const int IN1_pin = 8;

const int IN2_pin = 9;

const int IN3_pin = 10;

const int IN4_pin = 11;

void setup() {

// Arduino pin setup for Joystick

pinMode(SW_pin, INPUT);

digitalWrite(SW_pin, HIGH);

// Arduino pin setup for stepper motor

pinMode(IN1_pin, OUTPUT);

pinMode(IN2_pin, OUTPUT);

```
pinMode(IN3_pin,OUTPUT);
pinMode(IN4_pin,OUTPUT);
}

void loop() {
X_Rotate = analogRead(X_pin);
Y_Rotate = analogRead(Y_pin);
if (Y_Rotate < 500) {
digitalWrite(IN1_pin, HIGH);
digitalWrite(IN2_pin, LOW);
digitalWrite(IN3_pin, LOW);
digitalWrite(IN4_pin, LOW);
delay((Y_Rotate/2)+2);
digitalWrite(IN1_pin, LOW);
digitalWrite(IN2_pin, HIGH);
digitalWrite(IN3_pin, LOW);
digitalWrite(IN4_pin, LOW);
delay((Y_Rotate/2)+2);
digitalWrite(IN1_pin, LOW);
digitalWrite(IN2_pin, LOW);
digitalWrite(IN3_pin, HIGH);
digitalWrite(IN4_pin, LOW);
delay((Y_Rotate/2)+2);
```

```
digitalWrite(IN1_pin, LOW);  
digitalWrite(IN2_pin, LOW);  
digitalWrite(IN3_pin, LOW);  
digitalWrite(IN4_pin, HIGH);  
delay((Y_Rotate/2)+2);  
}  
  
else if (Y_Rotate > 550){  
digitalWrite(IN4_pin, HIGH);  
digitalWrite(IN3_pin, LOW);  
digitalWrite(IN2_pin, LOW);  
digitalWrite(IN1_pin, LOW);  
delay((1028-Y_Rotate)/2);  
digitalWrite(IN4_pin, LOW);  
digitalWrite(IN3_pin, HIGH);  
digitalWrite(IN2_pin, LOW);  
digitalWrite(IN1_pin, LOW);  
delay((1028-Y_Rotate)/2);  
digitalWrite(IN4_pin, LOW);  
digitalWrite(IN3_pin, LOW);  
digitalWrite(IN2_pin, HIGH);  
digitalWrite(IN1_pin, LOW);  
delay((1028-Y_Rotate)/2);
```

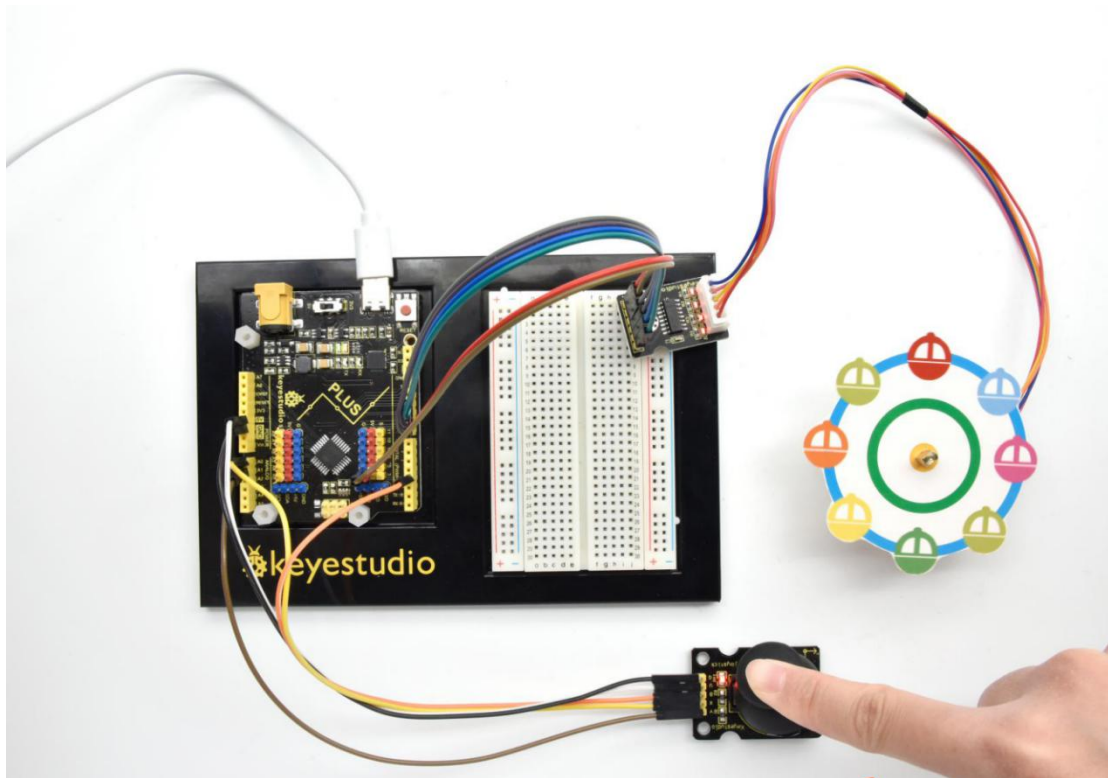
```

digitalWrite(IN4_pin, LOW);
digitalWrite(IN3_pin, LOW);
digitalWrite(IN2_pin, LOW);
digitalWrite(IN1_pin, HIGH);
delay((1028-Y_Rotate)/2);
}
else if (Y_Rotate > 500 && Y_Rotate < 550) {
digitalWrite(IN4_pin, LOW);
digitalWrite(IN3_pin, LOW);
digitalWrite(IN2_pin, LOW);
digitalWrite(IN1_pin, LOW);
}}
////////////////////////////////////

```

7.Project Result

Upload the project code to the Plus development board. Hook up the components as follows. Push the joystick, the stepper motor will rotate, just like we are playing on the Ferris wheel.



*****next

project*****