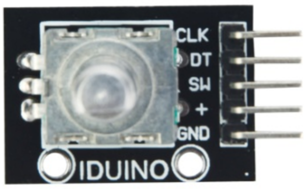
Rotary Encode Module (SE055)



Introduction

Rotary encoder is a rotary input device (as in knob) that provides an indication of how much the knob has been rotated AND what direction it is rotating in.It's a great device for stepper and servo motor control. You could also use it to control devices like digital potentiometers.

Specification

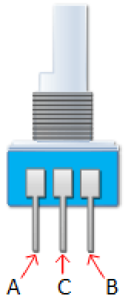
- Operation voltage: 5V
- 5Pinout
- Size:32*20*30mm
- Weight: 8g

Pinout

Pin	Description
CLK	Encoder A
DT	Encoder B
SW	Switch button
+	Power(5V DC)
Gnd	Ground

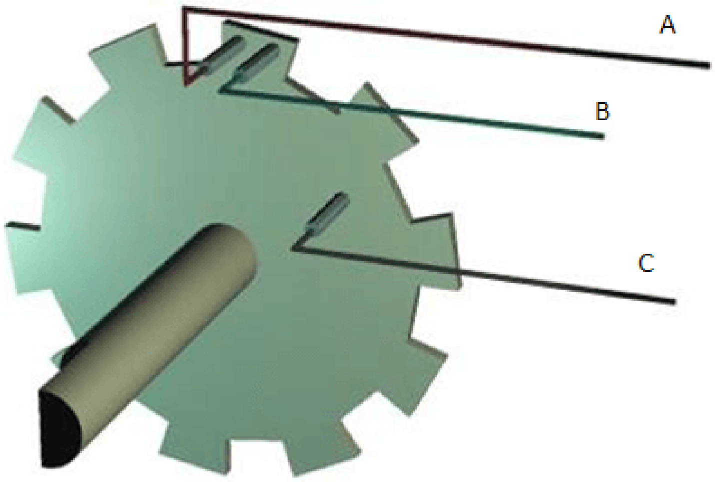
Rotary Encoder Basics

A rotary encoder has a fixed number of positions per revolution. These positions are easily felt as small “clicks” you turn the encoder.This module has thirty of these positions.
On one side of the switch there are three pins. They are normally referred to as A, B and C.
In the case of the SE055, they are oriented as shown.



Inside the encoder there are two switches. Once switch connects pin A to pin C and the other switch connects pin B to C.
In each encoder position, both switches are either opened or closed. Each click causes these switches to change states as follows:
If both switches are closed,turning the encoder either clockwise or counterclockwise one position will cause both switches to open
If both switches are open,turning the encoder either clockwise or counterclockwise one position will cause both switches to close.

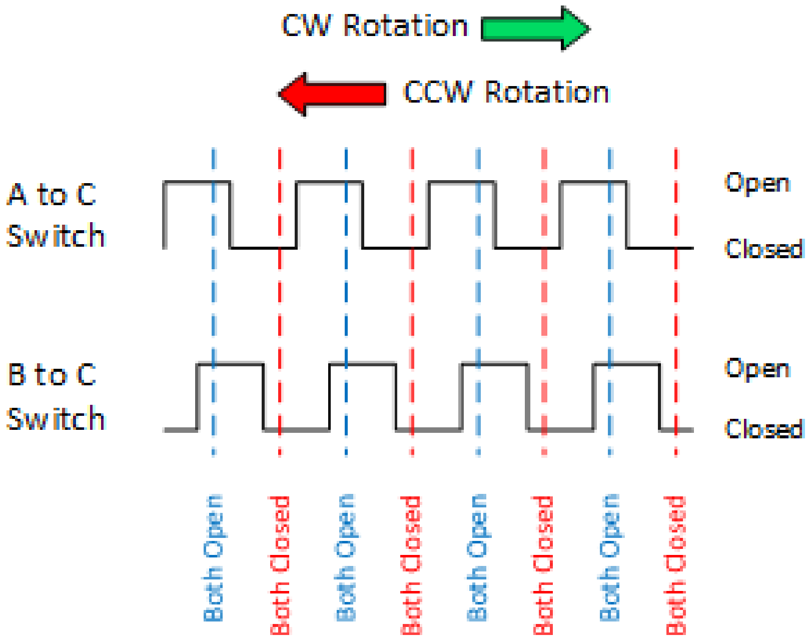
The illustration below is representative of how the switch is constructed.



As you can see, the angular position of the A terminal and the B terminal is such that:

- **Rotating the switch clockwise** will cause the switch connecting A and C to change states first.
- **Rotating the switch counterclockwise** will cause the switch connecting B and C to change states first.

If we were to represent the opening an closing of the switches as wave forms, it would look something like this.

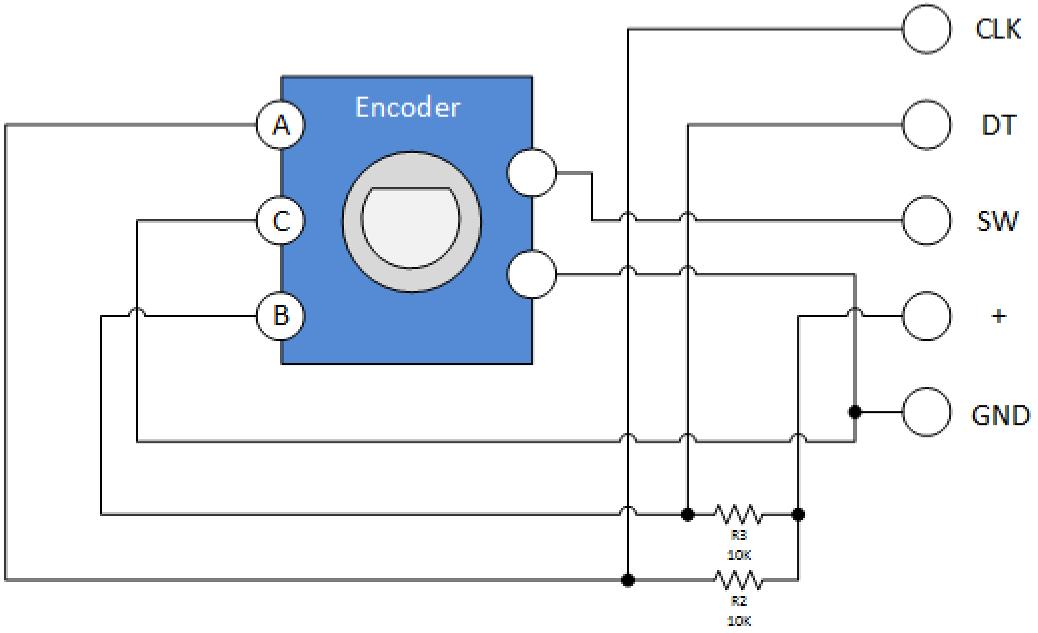


Essentially, determining which switch changed states first is how the direction of rotation is determined.

If A changed states first, the switch is rotating in a clockwise direction.

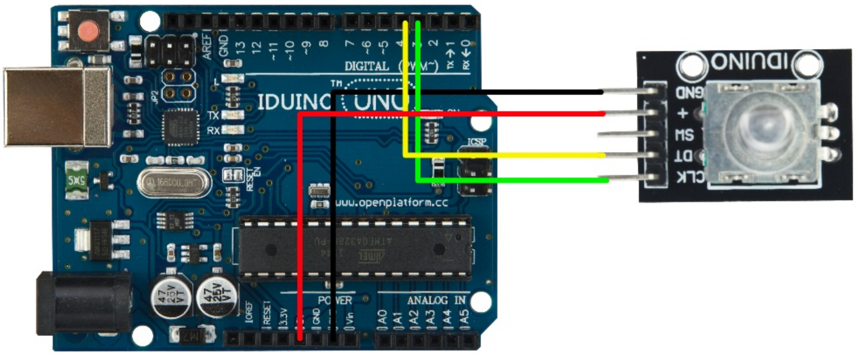
If B changed states first, the switch is rotating in a counter clockwise direction.

Rotary Encode Schematic



Example

This is a simple sketch that shows how to count the encoder position and how to determine direction of rotation. It has no switch debounce, nor does it use interrupts. A fully developed application might need to incorporate these in order to make it robust.



******Code Begin******

```
int pinA = 3;  // Connected to CLK
 int pinB = 4;  // Connected to DT
 int encoderPosCount = 0;
 int pinALast;
 int aVal;
 boolean bCW;

 void setup() {
   pinMode (pinA,INPUT);
   pinMode (pinB,INPUT);
   /* Read Pin A
   Whatever state it's in will reflect the last position
   */
   pinALast = digitalRead(pinA);
   Serial.begin (9600);
 }

 void loop() {
   aVal = digitalRead(pinA);
   if (aVal != pinALast){ // Means the knob is rotating
     // if the knob is rotating, we need to determine direction
     // We do that by reading pin B.
     if (digitalRead(pinB) != aVal) {  // Means pin A Changed first -
We're Rotating Clockwise
       encoderPosCount ++;
```

```
      bCW = true;
    } else {// Otherwise B changed first and we're moving CCW
      bCW = false;
      encoderPosCount--;
    }
    Serial.print ("Rotated: ");
    if (bCW){
      Serial.println ("clockwise");
    }else{
      Serial.println("counterclockwise");
    }
    Serial.print("Encoder Position: ");
    Serial.println(encoderPosCount);

  }
  pinALast = aVal;
}
```

******Code End******