

(<https://www.dfrobot.com/product-1601.html>)

## Introduction

This is an industrial incremental photoelectric rotary encoder with aluminum material, metal shell and stainless steel shaft. It generates AB two-phase



orthogonal pulse signal through the rotation of the grating disk and optocoupler. 400 pulses/round for each phase, and 1600 pulses/round for dual-phase 4 times output. This rotary encoder supports max 5000 r/min speed. And it can be used for speed, angle, angular velocity and other data measurement. The photoelectric rotary encoder has a NPN open collector output. It could work with Microcontroller with internal pull-up resistors directly. And it is using 750L05 voltage regulator chip, which has a DC4.8V-24V wide range power input, compatible with Arduino, STM32, PLC and other types of microcontrollers.



**Note: NPN open collector output needs pull-up resistors for the oscilloscope display.**

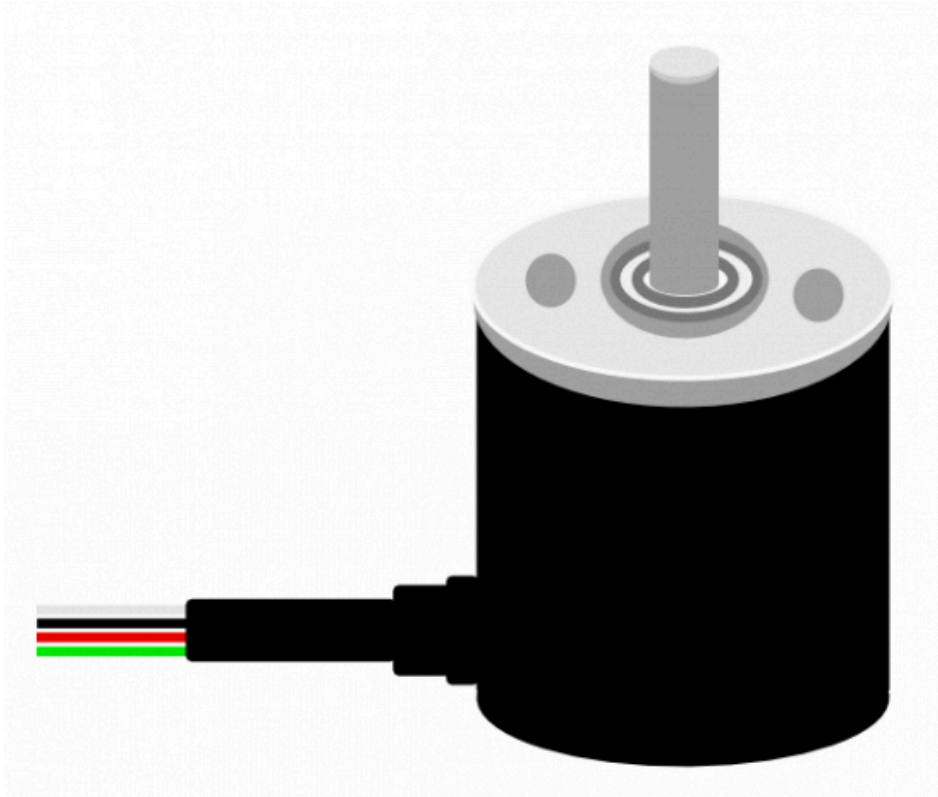
## Specification

- Supply Voltage: 4.8V ~ 24v
- Encoder Body Size:  $\Phi 39 \times 36.5\text{mm}$
- Output Shaft Diameter:  $\Phi 6 \times 13\text{mm}$

- Outside Shaft Platform:  $\Phi 20 \times 4.85$  mm
- Fixing Holes Screws: M3

## Board Overview

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| Num   | Label | Description                     |
|-------|-------|---------------------------------|
| Red   | VCC   | Power +                         |
| Black | GND   | Power -                         |
| White | A     | Pulse A (Need pull-up Resistor) |
| Green | B     | Pulse B (Need pull-up Resistor) |

## Tutorial

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Direction & Interrupt count

## Requirements

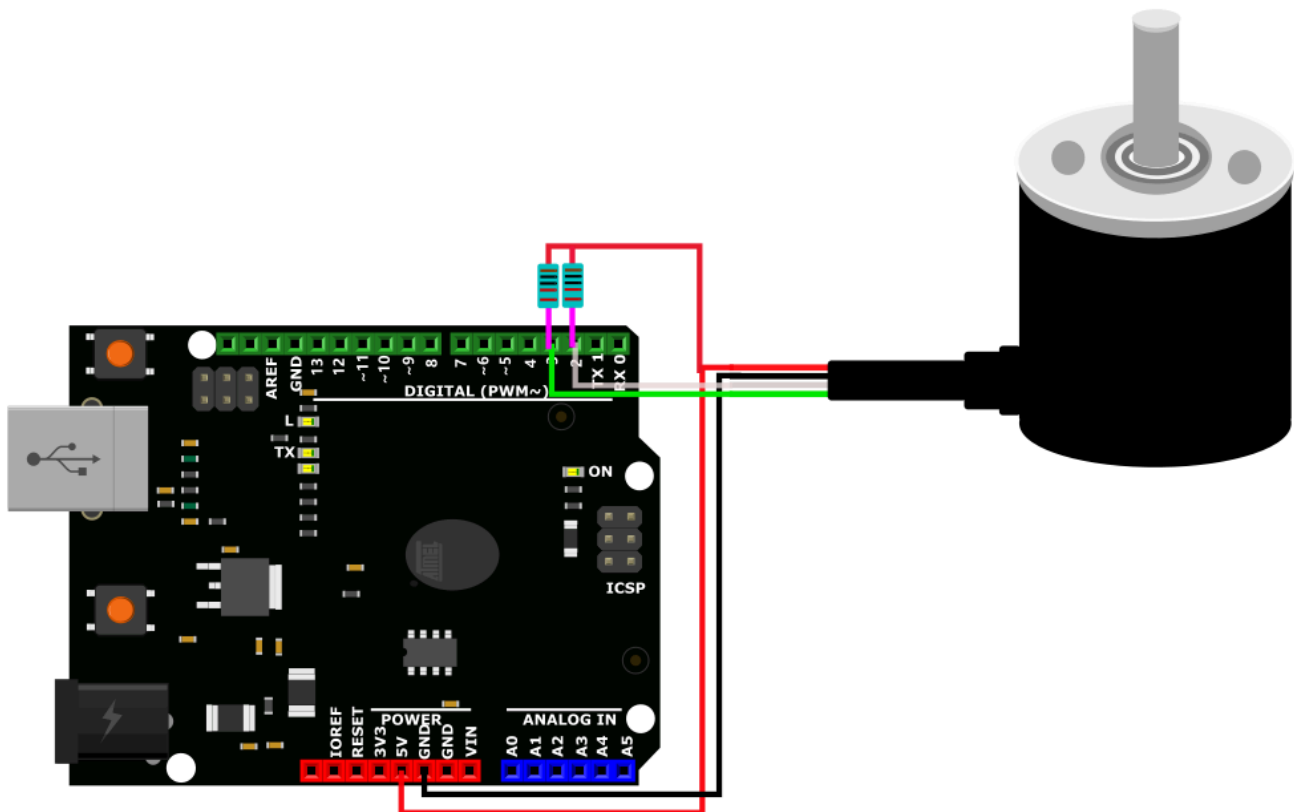
- **Hardware**

- DFRduino UNO (or similar) x 1
- Incremental Photoelectric Rotary Encoder
- 2x 1K Resistor
- M-M/F-M/F-F Jumper wires

- **Software**

- Arduino IDE, Click to Download Arduino IDE from Arduino® (<https://www.arduino.cc/en/software>)

## Connection Diagram



## Sample Code

```

/!*
 * @file SEN0230.ino
 * @brief Two phase quadrature encoder(Incremental)
 * @n To determine motor with encode (CW OR CCW)
 * @copyright Copyright (c) 2010 DFRobot Co.Ltd (http://www.dfrobot.com)
 * @license The MIT License (MIT)
 * @author Dongzi(1185787528@qq.com)
 * @version V1.0
 * @date 2016-5-26
 */

#define A_PHASE 2
#define B_PHASE 3
unsigned int flagA = 0; //Assign a value to the token bit
unsigned int flagB = 0; //Assign a value to the token bit
/** * */
void setup() {
  pinMode(A_PHASE, INPUT);
  pinMode(B_PHASE, INPUT);
  Serial.begin(9600); //Serial Port Baudrate: 9600
  attachInterrupt(digitalPinToInterrupt( A_PHASE), interrupt, RISING); //Inter
}
void loop() {

  Serial.print("CCW: ");
  Serial.println(flagA);
  Serial.print("CW: ");
  Serial.println(flagB);
  delay(1000); // Direction judgement

}
void interrupt() // Interrupt function
{ char i;
  i = digitalRead( B_PHASE);

```

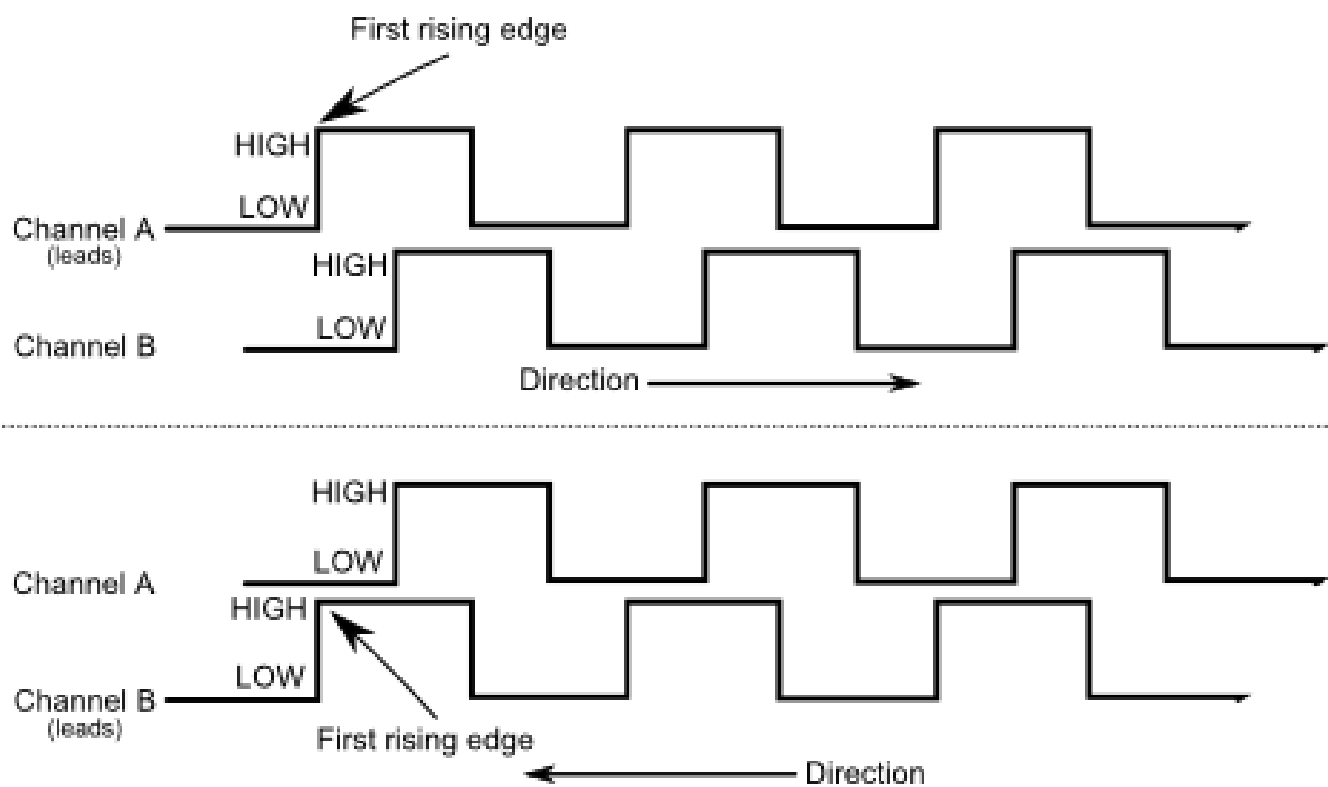
```

if (i == 1)
  flagA += 1;
else

  flagB += 1;
}

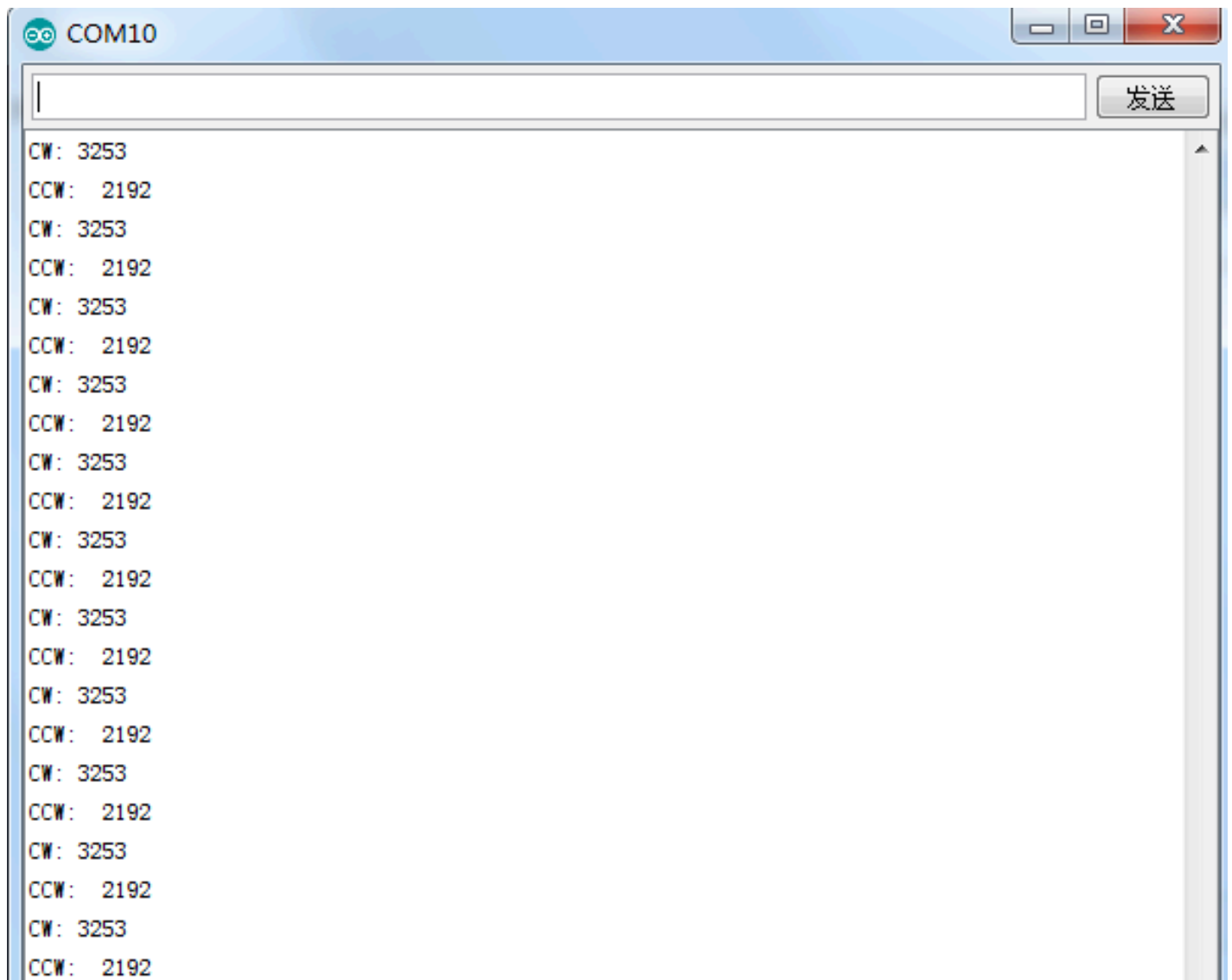
```

## OUTPUT



## Expected Results

Use the interruption to detect the rotation direction and count cylinder number.



## FAQ

**Q1. Why I can't get any feedback from the encoder?**

**A. Please connect pull-up resistor to phase A & B**

**For any questions, advice or cool ideas to share, please visit the DFRobot Forum (<https://www.dfrobot.com/forum/>).**

# More Documents

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