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 though 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: $\Phi39 \times 36.5$mm
- Output Shaft Diameter: $\Phi6 \times 13$mm
- Outside Shaft Platform: $\Phi20 \times 4.85$ mm
- Fixing Holes Screws: M3

Board Overview

<table>
<thead>
<tr>
<th>Num</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>VCC</td>
<td>Power +</td>
</tr>
<tr>
<td>Black</td>
<td>GND</td>
<td>Power -</td>
</tr>
<tr>
<td>Red</td>
<td>A</td>
<td>Pulse A (Need pull-up Resistor)</td>
</tr>
<tr>
<td>Green</td>
<td>B</td>
<td>Pulse B (Need pull-up Resistor)</td>
</tr>
</tbody>
</table>
Tutorial

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/Main/Software

Connection Diagram

```
/* **************************************************************************
   Two phase quadrature encoder(Incremental)
   ***************************************************************************/

To determine motor with encode (CW OR CCW)
```
```c
#define A_PHASE 2
#define B_PHASE 3

unsigned int flag_A = 0; //Assign a value to the token bit
unsigned int flag_B = 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); //Interrupt trigger mode: RISING
}

void loop() {
    Serial.print("CCW: ");
    Serial.println(flag_A);
    Serial.print("CW: ");
    Serial.println(flag_B);
    delay(1000); // Direction judgement
}

void interrupt() // Interrupt function
{
    char i;
    i = digitalRead(B_PHASE);
    if (i == 1)
        flag_A += 1;
    else
        flag_B += 1;
}
```
Expected Results

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

https://www.dfrobot.com/wiki/index.php/Incremental_Photoelectric_Rotary_Encoder_-_400P/RSKU:SEN0230 7-7-17