

Distance Measurement with Encoder

Encoder use : Orange 600 PPR 2-Phase Incremental Optical Rotary Encode

Controller use : Arduino

Encoder output values in 1 Revolution = 2400 values

25.8 values = 1 mm (Physical testing)

1 Revolution (360 degree) = 2400 values = 93 mm (Physical testing)

1 Value = 0.03875 mm

Distance travel = Encoder value x 0.03875

Error = ± 1 degree

Problem : when we rotate the encoder and rotate back to the initial position it shows -2 (not showing 0).

Code //

```
int encoderPin1 = 2;
int encoderPin2 = 3;

volatile int lastEncoded = 0;
volatile long encoderValue = 0;

long lastencoderValue = 0;
float encoderValueDegrees = 0;
float distance = 0;

int lastMSB = 0;
int lastLSB = 0;

void setup() {
    Serial.begin (9600);

    pinMode(encoderPin1, INPUT);
    pinMode(encoderPin2, INPUT);
}
```

```

digitalWrite(encoderPin1, HIGH); //turn pullup resistor on
digitalWrite(encoderPin2, HIGH); //turn pullup resistor on

//call updateEncoder() when any high/low changed seen
//on interrupt 0 (pin 2), or interrupt 1 (pin 3)
attachInterrupt(0, updateEncoder, CHANGE);
attachInterrupt(1, updateEncoder, CHANGE);
}

void loop(){
  // Read the encoder value in degrees
  encoderValueDegrees = encoderValue * 0.15; //0.075; // Using the conversion
  factor = 180/2400= 0.075, Adjusted for a 1:2 ratio (360/2 = 180 degrees per
  count)
  distance = encoderValue * 0.03875;

  Serial.print("Value : ");
  Serial.println(encoderValue);
  Serial.print("Degree : ");
  Serial.println(encoderValueDegrees);
  Serial.print("Distance : ");
  Serial.print(distance);
  Serial.println(" mm");
  delay(200); //just here to slow down the output, and show it will work even
  during a delay
}

void updateEncoder(){
  int MSB = digitalRead(encoderPin1); //MSB = most significant bit
  int LSB = digitalRead(encoderPin2); //LSB = least significant bit

  int encoded = (MSB << 1) | LSB; //converting the 2 pin value to single number
  int sum = (lastEncoded << 2) | encoded; //adding it to the previous encoded
  value
  // Serial.print("sum ");
  // Serial.println(sum);

```

```
    if(sum == 0b1101 || sum == 0b0100 || sum == 0b0010 || sum == 0b1011)
encoderValue ++;
    if(sum == 0b1110 || sum == 0b0111 || sum == 0b0001 || sum == 0b1000)
encoderValue --;

lastEncoded = encoded; //store this value for next time
}
```



