

Pseudocode for converting rotary encoder signal into RPM

1. Set up the sensors with nodeMCU
2. Declare the required variables.
Eg: count, rotations, rps, rpm, numberOfHoles etc
3. Initialize start time to current time and count to 0.
4. Set end time to a period of 2000 ms from the start time
5. Count the number of times the rotary encoder registers a signal in the given time interval. This is done as follows:

The Infrared LED and the NPN Photo Transistor are placed directly facing each other. When there is no object in the slot, the light from the Infrared LED always falls on the Photo Transistor and is registered as '1' or else '0'. We will count the number of times it registers a shift from 0 to 1.

6. Divide the count by the number of holes in the slotted disk. This will give the number of rotations in two seconds

$rotations = count / numberOfHoles$; numberOfHoles = 20 in our design

7. Divide by 2 to get the RPS, as we are taking a time interval of two seconds

$rps = rotations / 2$

8. Multiply by 60 to get the RPM

$rpm = rps * 60$

Pseudo-code

[spirometer inactive]

When spirometer was static AND sensor just detects light:

begin Stopwatch.

[spirometer active]

If sensor detects light:

 Add 1 to the PassCounter.

 If sensor still detects light, wait.

 Otherwise, start checking again.

 Set time to 0.

If sensor does not detect light:

 Count InactiveTime.

 If (InactiveTime > 10 seconds):

$RPM = PassCounter / Stopwatch * 60$

 Output RPM

 Return to [spirometer inactive]

 Start checking again.