# A SIMPLE VELOCITY MEASUREMENT SIGNAL CONDITIONING CIRCUIT

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## ABSTRACT

This paper presents an approach in signal conditioning circuit design for velocity measurement. The goal of this project is to achieve an accurate measurement of the velocity using a rotational disc and a photodetector as a sensor. A signal conditioning circuitry is used to transform the input signal into a suitable output. The light from the light source is captured by a photodetector when the disc rotated. The signals captured are then transformed to the desired output that is in term of frequency, voltage and speed in rotational per second.

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#### **CHAPTER 1**

### **PROJECT BACKGROUND**

#### 1.0 Introduction

Sensor technology has seen rapid development in the last decade. Technology choices for sensors, include cable extension, magnetic induction, microwave, optical or laser, piezoelectric, radar or radio frequency, strain gauge, and ultrasonic. Without sensors and their associated signal processing systems there would be no modern instrument.

In several years ago researchers have attempted to develop a velocity measurement used several techniques such as *scintillation of laser beam* [1], *angular and frequency correlation* [2], *self-mixing laser diode using speckle correlation* [3], and *rotated split-firm sensor* [4]. These techniques were applied for many types of velocity measurement included the air flow. The development of the techniques had been studied time to time in order to improve the system performance.

#### 1.1 **Project overview**

The system application focuses on the measurement of wind speed. The input from the wind speed measurement part of the system (anemometer) is generated by a slotted disc mounted on a wind vane. The wind causes the slotted disc to rotate proportional to the wind speed. A photodiode senses the light passed through the slotted disc and the circuitry produces pulses. The frequency of the pulses indicates the speed of the wind.

This information is processed through three stages; signal amplification, signal modification and signal conversion.