



**MEASURING SPEED AND DIRECTION USING
FIBER OPTIC TECHNOLOGY**

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**A thesis submitted in partial fulfillment of the requirements for the award of
Bachelor Engineering (Hons) Mechanical**

**FACULTY OF MECHANICAL ENGINEERING
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APRIL 2005

ACKNOWLEDGEMENT

First of all, I would like to express my appreciation to my advisor, Puan Nor Hayati Saad for her guide, patience and encourage in the duration of the thesis preparation. I would also like to thank Puan Zuriati Janin, Azham and technicians of FKM's workshop for their help and cooperation. Last but not least, I would also like to express my appreciation to individuals, group and all of my friends. Lastly to my lovely family that give support and encourage in order to finish my study.

ABSTRACT

This report discusses about the application of anemometer in practical. Some theories regarding the propeller anemometer are presented. One of the important parts of theories is regarding the dynamics theory of the propeller anemometer. The goal of this part is to achieve an accurate mechanical function of the speed and direction measurement of the wind. The propeller of the anemometer should be able to response the wind velocity and give the speed value, whilst, the anemometer should also detect the direction of the wind precisely. The full design of anemometer is very important to ensure movement of propeller anemometer function accurately with balancing and smooth moving.

This paper also presents an approach in signal conditioning circuit design for velocity and direction measurement. The goal is to achieve an accurate measurement of the velocity using rotational disc and photo detector as a sensor. The goal of this part is to achieve an accurate measurement of the direction using a photodiode. For speed, a signal conditional circuitry is used to transform the input signal into a suitable output. Light from the light source is captured by a photodetector. When disc rotated the captured signals are then transformed to the desired output that is in term of frequency, voltage and speed in rotational per second. For direction, signal conditioning circuitry is designed for direction used to transform the input signal from a sensor into a suitable output in term of degree (°). The signal of light is through the fiber optic and the reflection of light from depth of disc the through again fiber optic, captured by a photodiode when a disc rotated. Each hole of the disc has a unique value of depth. The signals captured at every depth and then transformed to the desired output. The measurement of speed and direction depend on the signal conditioning circuit.

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