Dedication

To my parents

Who introduced me to the joy of reading from birth,

Enabling such a study to take place today....

To My Husband

To My Brothers

To My Friends

To all who helped in issuing it in its final layout, as

Without their patience, understanding, support and

love the completion of this work wouldn't have been

possible.....

Acknowledgement

I wish to express my thanks to my supervisors; Prof. Nafie Muslet and Prof. Saad Doud This Thesis would not have been completed without their experience, advice, encouragement and unfailing patience. I am also most grateful for their faith in this study especially through difficult circumstances.

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ABSTRACT

This study aimed to design and implement a rotation speed sensor by using diode laser (671 nm, 50 mW).

The system is composed of photodetector received the laser light signal as pulses because of the use of disk plate (with one hole) which is welded to the motor shaft. The photodetector output signal had been modulated by a microcontroller which itself programmed by C Language to translate each pulse as one revolution per minute (rpm).

The designed sensor was operated to measure different rotation speed and it showed very accurate results and high efficiency compared with the Tachometer. The comparison showed, also that the implemented sensor was easy to use, very fast and can be used in some fields specially in the field of power generation stations in order to measure the speed of the rotating shaft with bigger diameter and with high accuracy.

المستخلص

هذه الدراسة إستهدفت تصميم و بناء متحسس للسرعة الدورانية بإستخدام ليزر الثنائى ذى الطول الموجى 671 نانومتر و قدرة 50 مللى واط.
المتحسس الذى نفذ فى هذه الدراسة و الذى يتكون من كاشف ضوئى يستقبل إشارة ليزرية ضوئية على شكل نبضات , هذه النبضات تتولد نتيجة لوجود قرص دائرى به ثقب متصل بعمود الحركة الدورانية للمحرك. يتم تضمين خـــــرج الكاشف الضـــوئى عن طـــريق إستخـــــدام متـــــحكم دقيق (Microcontroller) و الذى بدورة تتم برمجته بإستخدام برنامج يكتب بلغة C و ذلك لترجمة كل نبضة على انها واحد لفة فى الدقيقة.
هذا المتحسس صمم لقياس سرعات دورانية مختلفة و من خلال القياسات وجد أنها دقيقة جداً و تمت مقارنتها بقراءات و قياسات جهاز قياس السرعة الرقمى(Tachometer) ووجد أنه ذو كفاءة عالية , سهل التنفيذ , سهل الإستعمال و سريع جداً.
ويمكن إستعمال هذا المتحسس فى عدة تطبيقات خصوصاً فى مجالات محطات توليد الطاقة الكهربائية لقياس سرعة عمود الحركة الدورانية ذو القطر الكبير بكفاءة و دقة عالية.

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