UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF MICROCONTROLLER BASED POTENTIOMETRIC INDICATOR SYSTEM USING SURFACE MOUNT COMPONENT.

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree of qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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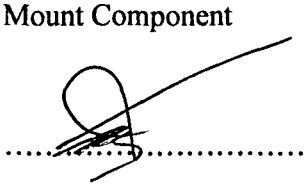
Signature of Student	:	
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ABSTRACT

The thesis reported the development of microcontroller based potentiometric indicator system using surface mount component. Methods based on salivary amylase activity to quantify the psychological stress have reported successes. There was a need for a non-invasive method to assist the individual in monitoring stress since stress is now the leading cause of diseases. The purpose of this research was to develop of microcontroller based potentiometric indicator system for a salivary biosensor using surface mount component. The purpose system involved the integration between hardware and software subsystem. For hardware subsystem, the design of potentiometric circuit was tested with theoretical computation, simulation on P-spice software and breadboard circuit. Then, the design was fabricated for printed circuit board and surface mount technology. This finding was then used to develop interface for the analog-to-digital converter. For software subsystem, the stress level indicator system has been developed using PIC 16F873 by converting the output from potentiometric circuit into stress level with a look-up table based on fuzzy rule sets for measuring human stress. It computes the digital data conversion into desired reading and displays data through the second hardware subsystem which is liquid crstal display. A potentiometric indicator for a piezoresistive MEMS biosensor to detect human stress was developed. It was comprised of a potentiometric transduction stage, filtering stage and linearization stage. From the experiment, it was shown that the potentiometric indicator designed was able to report changes in the amount of glucose in a different solution. The integration of the piezoresistive microcantilever biosensor with the potentiometric indicator system will have a significant impact on the practice of sensor integration with circuit minitarization.

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