SMART AQUARIUM

This thesis is presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Hons)
UNIVERSITI TEKNOLOGI MARA MALAYSIA

HAIRUL ANUAR BIN AZIZ

Faculty of Electrical Engineering

UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR

NOVEMBER 2006

ACKNOWLEDGMENT

Hairul Anuar Bin Aziz
Faculty of Electrical Engineering
Universiti Teknologi MARA (UiTM)
Shah Alam, Selangor Darul Ehsan

ABSTRACT

This thesis presents the implementation of the Smart Aquarium that has the ability to sense and control the dregs of the water and automatic feeding. The system developed is an automatic system and design based on the Peripheral Interface Controller (PIC) that acts as a controller. Certainly, this project consist of software and hardware development where knowledge in PIC programming, electronic and electrical devices are important to make the system operate. Controlling the dregs of the water is done by using dregs sensor connected to the aquarium and controlled by the PIC microcontroller.

The Smart Aquarium also has the ability to change the water automatically when the dregs level in the aquarium is detected high. The amount of water in the aquarium is controlled by water level sensor, which placed in the aquarium. The water that added into the aquarium comes from a prefill reservoir located above the aquarium setup. The water is controlled by a solenoid valve which is turned on and off by the PIC microcontroller. The water that drained out of the tank goes into a drain reservoir, which is located below the aquarium setup. A water pump attached to the hose leading to the drain reservoir to generate the suction needed to extract the water from the tank.

A servomotor controls the hole of automatic feeder either open or closed. The hole in the cylinder is designed such that only a specified amount of food is released per revolution. The feeding time is set by the user and controlled by the PIC microcontroller.

TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE

CHAPTER 1

INTRODUCTION

1.1   Introduction

Nowadays, there are various types of automatic aquarium system been developed for use by the experienced aquarium hobbyist and the aquarium novice. The systems also developed with different system controllers and functions respectively. The examples of the system are Aqua Kleen by using Programmable Logic Controller (PLC), Automated Aquarium Systems by using Dual-Program Controller/Timer, An Automated Aquarium that controlled by microprocessor and many more [1-3].

Mainly all the existing systems developed is to create the aquarium that purposely cares for and monitors the aquarium environment that would be a priceless asset to aquarium hobbyist. However, users have to spend much money to buy the system because most of the systems are too expensive. The first objective of the project is to develop or create a cheaper automatic aquarium system. Beside that, the system developed to provide options for user selection and easy to use.

The PIC microcontroller is the heart of the system which control all process or aspect of the aquarium environment. Beside it performance as controller, it is actually an inexpensive chip as compared with the other system controllers such as PLC or computer based system. The PIC microcontroller has many input and output pins, which can communicate with many electronic devices in one time. However, knowledge in PIC programming is important because it must programmed before used to control the system.