

AN INTELLIGENT FISH FEEDER SYSTEM

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PROJEK SARJANA MUDA II**

Tajuk Projek : AN INTELLIGENT FISH FEEDER SYSTEM

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Dedicated to my beloved parents, family and friends

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ABSTRACT

This project is about designing an intelligent system of automatic fish feeder using PIC microcontroller which uses Global System for Mobile Communication (GSM) modem to send the Short Message Service (SMS) to the owner when the sensor is trigger. So that, besides feeding the fish at required time, user can also monitor their fish. The objectives of this project are to develop and implement a system, which uses; Global System for Mobile Communication (GSM) modem to send the Short Message Service (SMS) to the owner when the sensor is trigger, then, to learn about the art of programming in C language, and also to combine together all hardware skills, electronic knowledge with some software development in building this project. A brief literature review was done on all the elements involved in this system including PIC microcontroller, sensor, keypad, GSM modem and DC motor. The main scope of work used in this project is constructing a compact design capable of being mounted on top of a fish tank. Then, study the operation of microcontroller and GSM. Next, identify the accurate and stable circuit and also suitable programming and its implementation. At the end this project the intelligent fish feeder system is designed and all of the objectives are achieved.

ABSTRAK

Projek ini bertujuan untuk menghasilkan sistem suapan makanan ikan secara automatik menggunakan mikrokontroler PIC dan juga terdapat Global System for Mobile Communication (GSM) modem untuk menghantar Short Message Service (SMS) kepada pemilik ketika kehabisan makanan. Oleh itu, selain memberi makan ikan pada masa yang ditetapkan, pengguna juga boleh memantau ikan mereka. Objektif projek ini adalah untuk mengembangkan dan melaksanakan system yang menggunakan; GSM modem untuk menghantar SMS kepada pemilik ketika sensor mengesan kehabisan makanan ikan, selain itu, mempelajari tentang seni program dalam bahasa C, dan juga untuk menggabungkan kemahiran, pengetahuan elektronik dengan pengetahuan mengenai software dalam melaksanakan projek ini. Kajian latar belakang juga dilakukan pada semua elemen yang terlibat dalam sistem termasuk PIC mikrokontroler, sensor, keypad, modem GSM dan motor DC. Skop kerja utama dalam projek ini adalah untuk menghasilkan sebuah rekabentuk system yang padat dan mampu ditempatkan di atas akuarium. Seterusnya, skop kerja yang perlu dilakukan ialah mempelajari operasi mikrokontroler dan GSM. Kemudian, mengenalpasti litar dan program implementasi yang sesuai. Di akhir projek ini, sistem suapan makanan ikan secara cerdas dihasilkan dan semua objektif tercapai.

TABLE OF CONTENTS

CHAPTER	ITEM	PAGE
	TITLE	i
	DECLARATION	iii
	DEDICATION	v
	ACKNOWLEDGEMENT	vi
	ABSTRAK	vii
	ABSTRACT	viii
	TABLE OF CONTENTS	ix
	LIST OF TABLES	xiii
	LIST OF FIGURES	xiv
	LIST OF APPENDIX	xvi
1	INTRODUCTION	
	1.1 Introduction	1
	1.2 Objectives	2
	1.3 Problem Statement	3
	1.4 Scope of Work	3
	1.5 Methodology	4

1.6	Thesis Structure	5
2	LITERATURE REVIEW	
2.1	Introduction	6
2.2	Automatic Fish Feeder	7
2.3	Electronic Fish Feeder	8
2.4	Microcontroller	9
2.4.1	Power Supply for Microcontroller	13
2.5	Display Unit	13
2.5.1	Liquid Crystal Display (LCD)	13
2.6	RS-232 (Communication Device)	16
2.7	Wireless Network	17
2.8	DC motor	19
2.9	Keypad	22
2.9.1	Keypad Encoder	23
2.9.2	Theory of Operation	24
2.10	Proximity Sensor	26
3	PROJECT METHODOLOGY	
3.1	Introduction	28
3.2	Hardware	29
3.2.1	System Block Diagram	30
3.2.2	Power Supply Circuit	30
3.2.3	Main Controller Circuit	31
3.2.4	Keypad Circuit	32
3.2.5	Interface Circuit	33

3.3	Software	34
3.3.1	MPLab C Compiler	35
3.3.2	C language	35
3.3.2.1	The structure of C program	35
3.3.2.2	Shorts Message Commands	37
3.3.3	Flow Chart of the Programming	39
3.3.4	The Main Programming Coding	40
3.3.5	Flow Chart of Sending SMS to GSM Modem	45
3.3.6	Sending SMS Programming Coding	46
4	RESULTS AND ANALYSIS	
4.1	Introduction	49
4.2	Power Supply Analysis	49
4.2.1	Results	50
4.2.2	Discussion	50
4.3	Main Controller Circuit Analysis	51
4.2.1	Results	51
4.2.2	Discussion	53
4.4	Keypad Circuit Analysis	54
4.2.1	Results	54
4.2.2	Discussion	55
4.5	Display Circuit Analysis	55
4.2.1	Results	56
4.2.2	Discussion	57

5	CONCLUSION AND SUGGESTION	
	5.1 Introduction	58
	5.2 Conclusion	58
	5.3 Recommendations	59
	REFERENCES	60
	APPENDIX A	62
	APPENDIX B	93
	APPENDIX C	95

LIST OF TABLE

NO	TITLE	PAGE
2.1	Comparison with the previous project 1	7
2.2	Comparison with the previous project 2	9
2.3	Comparison between PIC 16F877, PIC 16F84A and PIC 16F876	11
2.4	Comparison of 8-bit microcontroller and their features	12
2.5	LCD differences	14
2.6	Comparison between LCD, Hand phone and personal computer	15
2.7	Features of GSM Modem	19
2.8	Terms of the chosen DC motor	21
2.9	Truth table for data output [12]	24
2.10	Comparison of sensors	27
3.1	Syntax: AT+CMGF	38
4.1	Testing the 5 volt dc voltage	50
4.2	Output for LCD display	56
4.3	Output for hand phone display	56

LIST OF FIGURES

NO	TITLE	PAGE
2.1	The automatic fish feeder	8
2.2	PIC 16F877 and PIC 16F84A	11
2.3	Liquid Crystal Display (LCD)	15
2.4	Asynchronous Data Transmission	16
2.5	MAX232 Pin Configurations and Typical Operating Circuit	17
2.6	GSM Modem	18
2.7	Process of DC motor	20
2.8	Exhausted fan	21
2.9	Keypad 4x4	22
2.10	Keypad row/column matrixes	22
2.11	Pin assignment for DIP	23
2.12	Optical wheel rotation sensor circuit	26
3.1	Block Diagram for the whole system	30
3.2	Power supply circuit	31
3.3	Main controller circuit	32
3.4	Keypad circuit	33
3.5	Interface circuit	34
3.6	Coding for checking the container	40
3.7	Coding for checking the keypad	41
3.8	Coding for setting timer	42

3.9	Coding for difference of set timeH1 and set time1	43
3.10	Coding for checking alarm (relay turns on)	44
3.11	Coding for filling address to send SMS to user (0179357627)	47
3.12	Coding for setting text mode to send SMS (Warning! Empty)	48
4.1	Main controller circuit	52
4.2	Sensor circuit	52
4.3	Interface circuit (MAX 232)	53
4.4	Connection between keypad to keypad encoder	55

LIST OF APPENDIX

NO	TITLE	PAGE
A	Programming Coding For PIC 16f877A	62
B	Microchip PIC16f877A Data Sheet	93
C	LM7805 Data Sheet	95

CHAPTER 1

INTRODUCTION

1.1 Introduction

Intelligent Fish Feeder is a product that is design to feed fish at certain amount of time that is required by user. The system runs automatically with the absence of the owner. The user has to fill the food in the food container first. Then the time is set by key-in any value of time that is needed to feed the fish. The user interacts with the unit through a display/keyboard combination that is connected to the system. The system will count down and when they reached the required time, the gate of food container will open.

The operation will continue automatically if the user set a new time to feed the fish. If the food in the container is empty, the sensor will detect the error and by using GSM modem, user will be notified to take action about the situation and at the same time can monitored their pet.

The Intelligent Fish Feeder is controlled by a programmable microcontroller; this is a necessity for a design that features an alphanumeric LCD display that interacts with the user. The design requires a DC motor to drops the food from the gate of food container. The Global System for Mobile Communication (GSM) modem is used to send the Short Message Service (SMS) to the owner when the alarm sensor is trigger when food did not drop into the aquarium.

1.2 Objectives

There are several objectives that are to be achieved at the end of the project which includes:

- i. To design an intelligent system of automatic fish feeder using PIC microcontroller.
- ii. To develop and implement a system, which uses; Global System for Mobile Communication (GSM) modem to send the Short Message Service (SMS) to the owner when the sensor is trigger.
- iii. To learn about the art of programming in C language.
- iv. To combine together all hardware skills, electronic knowledge with some software development in building this project.

1.3 Problem Statement

Aquarium keeping is a popular hobby around the world. The predecessor of the modern aquarium was introduced in 1850 as a novel curiosity; since then, aquarium ownership has expanded as more sophisticated systems including lighting and filtration systems were developed to keep aquarium fish healthy [1]. Pets such as fish need to be fed by the owner to keep it healthy. To make sure that it has enough food supplements, the fish need to eat at certain time. This has to be the owner's responsible. Each types of fish requires differ feeding time.

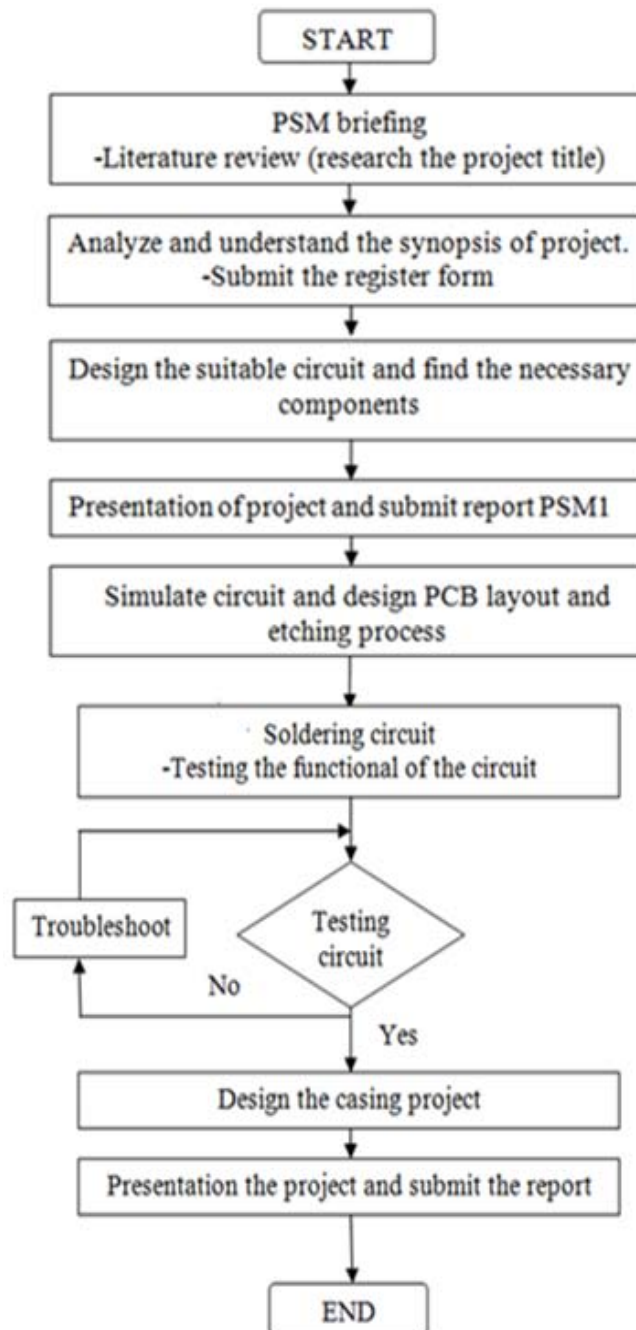
Nowadays, there are people willing to spend hundreds or thousands of money for their fish [10]. The price of exotic fishes also gets higher and can reach thousands ringgit and steel the attention from buyers. Problems occurs if the owner is away from home or been busy and forget to feed the fish. It will be such a waste if fish that is very expensive died because of the owner is too busy to feed the fish. These IFF system can solve this problem by providing system that can feed the feed with the feeding time is required by the user. Next, if there is error occur to the automatic system, when the owner are away, they cannot be notify that there is problem and their fish did not get the food supplement. Therefore, besides feeding the fish at required time, user can also monitor their fish

1.4 Scope of Work

As to ensure the completion of project achieves the stated objectives, the project shall be completed within these scopes; to build an IFF system and construct a compact design capable of being mounted on top of a fish tank. Then, study the operation of microcontroller and GSM. Next, identify the accurate and stable circuit and also suitable programming and its implementation.

1.5 Methodology

To achieve the goal that has been set in the objectives of this project, certain methods shall be used.



1.6 Thesis Structure

Chapter 1 will be discussed about an introduction of the project. The main idea is about the background and objectives of the project will be discussed. Then, Chapter 2 is about literature review of the project. This project discusses the concept of the research and how it related with the theory. As for Chapter 3, the explanation about the methodology and process that taken to complete the project. It consist the detail development of this project.

Chapter 4 is about the result obtaining based on the methodology used. The obtained result will be discussed and analyze and based on the objectives and problem statement. Chapter 5 is about the summary of project achievement. It also includes the conclusion and recommendation that can be taken for future improvement of the project.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter is discussing about previous research in fish feeder system related on the project. There are two previous projects that will be discussed in this chapter. The project is ‘Automatic Fish Feeder’ and ‘Electronic Fish Feeder’.

2.2 Automatic Fish Feeder

This device will dispense frozen fish food into an aquarium. It will be capable of dispensing frozen blocks of food at a several times a day at any desired time (all times are programmable). The device will use an array of thermoelectric coolers mounted onto a stainless steel cold plate to keep the product frozen without making any noise. A heat sink is mounted onto the hot side of the thermoelectric device. A low speed fan keeps the heat sink temperature low [1].

Table 2.1: Comparison with the previous project 1

ELEMENTS	MY IFF SYSTEM	EXISTING FF SYSTEM
DESIGN	COMPACT	LARGE
ADVANTAGES	ALARM SYSTEM GSM MODEM TO SEND SMS TO NOTIFY USER	DOES NOT HAVE ALARM SYSTEM FROZEN FOOD



Figure 2.1: The automatic fish feeder

2.3 Electronic Fish Feeder

An auto fish feeder is designed to dispense the right amount of food into your aquarium at a certain time each day. The system contains an electrical timing circuit for periodically distributing food stuffs contained in a hopper to the aquarium. The distribution is accomplished by an electric motor driving a gear box, the output of the gear box driving a cylinder that has a rough surface. The cylinder in cooperation with a pair of baffles sends a predetermined amount of food into the aquarium during the feeding time interval [7].