

**FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
PULAU PINANG**

**FINAL REPORT:
DENSITY BASED TRAFFIC SIGNAL SYSTEM USING
PIC16F877A AND IR SENSOR**

MUHAMAD FAZLI BIN ZAINOLDIN

MOHAMAD RADZMAN BIN RUSDI

**SUPERVISOR:
PUAN NORHASNELLY BINTI ANUAR**

**This report is submitted to the Faculty of Electrical Engineering,
Universiti Teknologi MARA (UiTM).
In partial fulfilment of the requirement for the award of Diploma in Electrical
Engineering.**

This report is approved by :

.....

PUAN NORHASNELLY BINTI ANUAR

(SUPERVISOR)

Date :6/10/2016.....

ABSTRACT

The Density Based Traffic Signal System using PIC 16F877A and IR sensor is designed to reduce possibilities of traffic jams, caused by traffic lights, to an extent. The microcontroller used in the system is PIC 16F877A. The system contains IR transmitter and IR receiver which are mounted on the either sides of roads respectively. The IR system gets activated whenever any vehicle stopped on road between IR transmitter and IR receiver. Microcontroller controls the IR system by programming that had been setting in the microcontroller. The flow of traffic light system began when IR sensor starts detect the existence of vehicles. So, IR sensors are placed in the left and right in front of the road. If it detects the existence of the vehicles on particular road, the traffic will glowing green colour for 20 seconds. At the same time, the 7-segment will display countdown timer. But if no vehicles are detected, green colour of traffic light will not glowing and skip to the others particular junction that having a vehicles. So, IR sensors is major role in this project of traffic light system.

It is observed that the flow of traffic light system is improved when IR system is added to the projects.

ACKNOWLEDGEMENTS

First and foremost, I offer my sincerest gratitude to our supervisor Madam Norhasnelly binti Anuar whose contribution in stimulating suggestions and encouragement helped us to coordinate our project especially in writing this report.

Furthermore, I would also like to acknowledge with much appreciation to crucial role of the staff of UiTM Penang, who gave the permission to use all required equipment and the necessary materials to complete the Density Based Traffic Signal System using PIC 16F877A and IR sensor. Besides, I have to appreciate the guidance given by other supervisor as well as the panels especially in our project presentation that has improved our presentation skills and thanks to their comment and advices.

Lastly, I offer my regards and blessings to my colleagues and all of those who supported me and my teammate in any respect during the completion of the project.

TABLE OF CONTENTS

ACKNOWLEDGEMENT.....	i
ABSTRACT.....	ii
LIST OF FIGURES.....	iii
LIST OF TABLES.....	v
LIST OF ABBREVIATIONS.....	vi
CHAPTER 1 INTRODUCTION.....	1
1.1 Background of Study.....	1
1.2 Problem Statement.....	2
1.3 Objectives of Research.....	3
1.4 Scope of Study.....	3
CHAPTER 2 MATERIALS AND METHODS.....	4
2.1 Block Diagram.....	4
2.2 System Operation (Flow Chart).....	5
2.3 Experimental Setup.....	6
2.4 Block Diagram of Hardware.....	10
CHAPTER 3 CIRCUIT DESIGN AND OPERATIONS.....	11
3.1 Schematic Diagram.....	11
3.2 Hardware Description.....	19
3.3 Drilling Process.....	26
3.4 Soldering Process.....	27
CHAPTER 4 RESULTS AND DISCUSSION.....	28
4.1 Simulation Test Result.....	28
4.2 Hardware Implementation Result.....	31
4.3 Troubleshooting.....	33
4.4 Discussion.....	34
CHAPTER 5: CONCLUSION AND RECOMMENDATION.....	36
5.1 Conclusion.....	36
5.2 Recommendation.....	36
REFERENCES.....	37
APPENDICES.....	39