

# **DESIGN AND CONSTRUCTION OF A MICRO – CONTROLLER BASED ALTERNATING CURRENT TIMER**

BY

**JIYA JAPHETH  
2001/12011EE**

**DEPARTMENT OF ELECTRICAL/COMPUTER ENGINEERING  
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.**

## **USER MANUAL**

### **INSTALLATION:**

The automatic A.C. Timer can be installed by connecting the external device to its terminal located behind the timer. Then plug timer to power source.

### **OPERATION:**

Once timer is switched on, set the timer to 0:00 then set your time by pressing either the minute switch or hour switch to your required time. Then press the  $t_{on}/t_{off}$  switch twice to save time for on and off. After that is done, set timer back to 00:00 and then press  $t_{on}$  switch to start timer.

### **PRECAUTION:**

The following precaution should be adhered to.

1. Keep timer in a safe place.
2. Keep out of reach of children.

**DESIGN AND CONSTRUCTION OF A  
MICRO-CONTROLLER BASED  
ALTERNATING CURRENT TIMER**

**JIYA JAPHETH**

**2001/12011EE**

**A THESIS SUBMITTED TO THE DEPARTMENT OF  
ELECTRICAL/COMPUTER ENGINEERING  
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA**

**NOVEMBER, 2007**

## **DEDICATION**

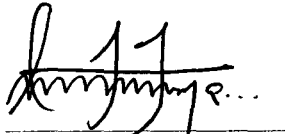
dedicate this work to my parents, LATE Mr. and Mrs. Jiya as well as my younger brother, Mr. Jude Jiya for being there for me.

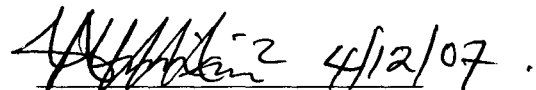
## DECLARATION

JIYA JAPHETH, declare that this work was done by me, and has never been presented elsewhere for the award of a degree. I also relinquish the copyright to the Federal University of Technology, Minna.

**JIYA JAPHETH**  
(Name of Student)

**MR. ABRAHAM USMAN**  
(Name of Supervisor)

 4/12/07  
(Signature and Date)

 4/12/07  
(Signature and Date)

\_\_\_\_\_  
(Name of H.O.D)

\_\_\_\_\_  
(Name of External Examiner)

\_\_\_\_\_  
(Signature and Date)

\_\_\_\_\_  
(Signature and Date)

## **ABSTRACT**

The circuit is designed to actually set timing to appliances that uses alternating current supply. The circuit comprises of basically a micro controller and other peripheral devices.

The circuit is used with applications that have high risk of usage (i.e. appliances that could lead to a serious disaster if not properly monitored or operated) such as electric cooker, microwave ovens, and so on. A micro-controller was programmed using assembling language. The timer can be set for a device within any timing range between One (1) minutes and twenty-Four (24) hours.

3.4	Four Digit Seven Segment Display.....	21
3.5	Software.....	25
3.6	Keyboard Scanning.....	26
	Micro computer programs .....	30
<b>Chapter Four:</b>		
4.0	Project Construction .....	36
4.1	Testing .....	36
4.2	Results and Discussion .....	36
<b>Chapter Five: Conclusions, Problems Encountered and Recommendations</b>		
5.0	Conclusion .....	37
5.1	Problems Encountered .....	37
5.2	Recommendation .....	37
	References.....	39

## LIST OF FIGURES

Figure 1.0: Project Block Diagram.....	5
Figure 3.10: Power Supply with Rectified Output.....	9
Figure 3.11: Half wave Rectifier.....	10
Figure 3.12: Half wave Output wave form .....	11
Figure 3.13: Full wave Bridge Rectifier.....	12
Figure 3.14: Full wave output wave form.....	12
Figure 3.15: Low-Pass Filter.....	13
Figure 3.16: 5volt DC Regulator Circuit.....	14
Figure 3.17: Regulated DC Power Supply.....	15
Figure 3.21: RC Reset Network .....	16
Figure 3.31: Load Power switch.....	17
Figure 3.41: Display Interface with Micro-controller.....	20
Figure 3.51: Full Project's Circuit Diagram.....	26