

**AUTOMATIC CONTROLLER FOR RUNNING
SINGLE PHASE GENERATOR
USING PC**

**This is presented to fulfill the
requirement of Advanced Diploma in Electrical
Engineering of MARA Institute of Technology**

NIK HAMIDI BIN CHE HAMID

NOV 1994

**Department of Electrical Engineering
MARA Institute of Technology
40450 Shah Alam
Selangor
MALAYSIA**

ACKNOWLEDGEMENTS

In the name of ALLAH, the Beneficent and the Merciful. It is with the deepest sense of gratitude to the Al-Mighty ALLAH who gives strength and ability to complete this project and report as it is today.

I'm personally indebted to my project supervisor, En. Mohd Zaki bin Abdullah who deserves most credits of his patience, inspiration and advice in guiding towards the completion of the project and report. Credits also goes to En. Ahmad Maliki bin Omar for his encouragement and advice that has helped me a lot.

I take this opportunity to express my sincere gratitude and appreciation to mechanical technical assistant, En. Abdul Halim bin Minar and the staff of mechanical department for their constructive criticisms, guidance and suggestions. I also wish to express my heartiest thanks to lecturers, technicians in the laboratory and a number of individuals especially to my partner Mohd Faril bin Ismail for their invaluable assistance and co-operation.

ABSTRACT

The objectives of this project is to develop an automatic system for running of single phase generator to provide backup power supply to UPS using PC (personal computer) when the main power supply failure. This project is concerned with the computer as a controller operating through a low cost special interface to control the relays switching. The interface uses the standard RS-232-C serial communication port which means it can interface between computer and control devices. The software is designed to monitor the existing and detects failure in supply system and to control the output devices. The simple QBASIC program is developed to manipulate the system.

contents	Page
Dedication.....	i
Approval.....	ii
Acknowledgements.....	iii
Abstract.....	iv
Chapter 1	
1.0 Introduction	1
1.1 Scope of project	2
Chapter 2	
2.0 UPS system	4
2.1 Serial Interface	5
2.2 Handshaking	6
2.3 Asynchronous Technique	8
2.4 Address Decoder (74HC138)	9
2.5 Binary Decoded Output Latch (74HC259)	10
Chapter 3	
3.0 Implementation of Interface	11
3.1 Interface Circuit	12
3.2 UART as a converter	
3.2.1 Receiving Data	13
3.2.2 Transmitting Data	14
3.3.3 Addressing the interface	

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

The fundamental of the project is to control the standby generator automatically to maintain essential power supplies in the event of mains failure conditions. With the increased used of computers for such critical loads as data processing, air-traffic-control systems, national defence and other installations where failure could endanger national or public safety, it is essential to use an uninterruptible power supply (UPS).

The UPS with batteries capable powering the load for a few minutes in the event of a loss of mains power, but with a standby generator able to take over as substitute AC supply as soon as possible. To satisfy this requirement, the standby generator need the controller to monitor and control the system operation continuously.

With the spread use of computers in all works of life, this system operation introduces the computer to act as a controller. The power of the computer is supplied by the UPS wherever there is a power failure in order to make it works. Using the appropriate software, the computer can control the whole system operation automatically and display some switching system on the screen.

The principle points of the controller is that an operators at remote maintenance location can define the faults status with monitoring the input and output action on the