UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG

A DESIGN OF AN AUTOMATIC POWER SUPPLY USING ARDUINO

MUHAMMAD HAZIMAN BIN MAHADI

Faculty of ElectricaL Engineering

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ABSTRACT

This study is about design of an Automatic Power Supply using Arduino. The best design for an automatic power supply is designing an Uninterruptable Power Supply system. The system is reliable and applicable to every electrical appliance because it can give a backup power supplies when the main power is fail as well as to protect the system data and electrical power instrumentation. The objective of this study is to design an Automatic Power Supply using an Arduino and to study the power quality of the system. There are 4 main components for this design which is the Arduino as the microcontroller, rectifier as the battery charger circuit, battery as a backup supply and pure sine wave inverter to convert the DC supply from the battery to AC supply and deliver it to the load. The power quality of the system can be measure and analyse by using suitable equipment such as oscilloscope to measure the harmonic distortion of the system or Fluke Recorder which can collect all the data of the system and monitor it through the Fluke analyser software. The method in this system is to design a system that can provide a backup power supply when there's a failure in the main power supply without any time delay to avoid and to protect the equipment from damage and losses data. The design of the Automatic Power Supply is done by following all the specifications that was needed from all the research.

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INTRODUCTION

1.0 RESEARCH BACKGROUND

Electric power technology has developed rapidly over time. With the development of electric power technology, power systems and utility networks should be also expanded in various ways to help increase user productivity. In addition, the system load power has also been growth in a different way that is mostly made of electronic devices such as industrial processing applications, data centers, emergency equipment, medical facilities, telecommunications, and computerized data system. Thus with the development of the power system load, especially in the sensitivity of the system load power, then any development of electrical equipment and power supply with high reliability is very important. With every change that occurs in electric power technology, each system requires a system that can provide energy supply though the power supply is disconnected. Therefore uninterruptible power supplies (UPS) has been introduced and the main function of UPS is to act as an emergency power supply of high quality and are also able to protect every electrical equipment and the data stored during the occurrence of undesirable situations such as power supply failure. Basically, uninterruptible power supply systems (UPS) is an electric instrument that is connected between the user and the electricity grid, the main purpose of the UPS is to provide emergency backup power supply or when the main power source fails. With this system it is able to provide protection from power outages almost immediately with the input energy that is stored in a battery. Basically, the electric power supply interruptions can come in a variety of forms, such as harmonics, voltage spikes, voltage dips and surges. Having this disorder it can cause sensitive electronic equipment gained serious damage, especially during the critical stages of production or processing operation. So to reduce the risk of misuse of power