LEAD ACID BATTERY CHARGER AND STATE OF CHARGE WITH LIGHT EMITTING DIODE LAMP

This thesis is presented in partial fulfillment for the award of the

Bachelor of Engineering (Hons.) Electrical

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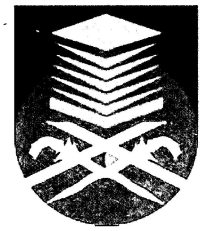

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ABSTRACT

Night market is a very common place in Malaysia where people go and do small businesses. Since this event happens at night, the presence of light is very important. Most sellers usually used a generator as an alternative to supply electricity to their lamps. However, the cost for a generator and fuel can be expensive. The usage of generator also has its side effects. Generator burns fossil fuel to generate electricity. Whenever fuel is burnt, there is obviously some level of air pollution released in the form of exhaust gases. Besides air pollution, generators also produce another type of pollution which is noise. Noisy surrounding can somehow affect the mood of customers to shop. By using a battery, these pollutions would not occur as it do not produce sound and do not emit chemicals into the air.

The main purpose of this project is to design and build a rechargeable battery indicator that can be used to supply LED. The type of battery used is a lead acid battery. This battery is then connected to an indicator that will indicate the state of charge (SOC) of the battery. The proposed method of SOC that is used is voltage based estimation. This uses the battery cell voltage as the basis for calculating SOC or the remaining capacity. A proper design must be done so that the device works as expected.

The LM317 voltage regulator is used in the charger circuit to regulate the voltage and convert the current it into complete direct current. The prototype used LED bar graph as visual in determining the state of charge. The LED bar graph lit up gradually depending on the battery voltage. This bar graph is controlled by the bar display, LM3914. The two converters are combined together into one circuit by using a 3 pole toggle switch. All tests are done by using a 12V lead acid battery with 7.2 AH. Results from tests were then used for calibration process in order to achieve accuracy.

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