

Design of Charge Controller for Mobile using Arduino & GSM

A.Subramaniya Siva¹, P.Arulkumar², B.Senthilkumar³, Surya Palanichamy Ravi⁴, N.Vinothini⁵

¹Assistant Professor, Department of Electrical and Electronics Engineering, K.Ramakrishnan College of Engineering, Tiruchirappalli, Tamilnadu, India

²Associate Professor, Department of Electrical and Electronics Engineering, V.S.B Engineering College, Karur, Tamilnadu, India

³Professor, Department of Electrical and Electronics Engineering, V.S.B Engineering College, Karur, Tamilnadu, India

⁴Lecturer, Electrical Engineering, University of Technology & Applied Sciences, Nizwa.

⁵Assistant Professor, Department of Electrical and Electronics Engineering, K.Ramakrishnan College of Engineering, Tiruchirappalli, Tamilnadu, India

¹npksiva.ss@gmail.com, ²arulkumarme@gmail.com, ³professor.senthilkumar@gmail.com,

⁴ravi.surya13@gmail.com, ⁵vinooeekrce@gmail.com

ABSTRACT :- All persons having mobile facing the issue that connecting our mobile in the charger & forget to disconnect the charger from the socket. In the technology developed state our mobiles will disconnect the supply to the battery automatically, but it retains the battery in the charging state known as trickle charging. The main disadvantage of holding the mobile unplugged after its gets full charged will decrease the life span of the battery. Every battery life span is determined depending upon the number of charge cycles. In spite of this continuous state temperature gets increased in the mobile & its affects the mobile hardware. Here the system which consists of Arduino UNO & GSM SIM800C. By using an application which reads the current battery status and sends message when its charged. GSM SIM800C receives the message and send a signal to Arduino which is programmed to trip off the circuit when it receives the signal. This will be very useful to the people those who are charging their mobile in the night time. It prevents from overcharging and consumption of power. Through this we can consume power from wasting and increase the lifetime of battery.

Keywords- Arduino, Battery, GSM

1. INTRODUCTION

Nowadays Smart phone is having very high advanced technology than a personal computer. In that smart phone we can access mobile banking whatapp, facebook & other social medias. Mobile phone is having Lithium ion batteries & it was the one we can charge very fastly. In mobile by using android OS we can use many apps as Google map, Gmail,etc., [1,2]And also the size of the mobile was very small as compared to personal computers. The batteries in the mobile phones are rechargeable that is one of the big advantage as compared to personal computer. Many peoples are connecting their mobiles to charger & forget to remove as it as fully charged. Due to this the battery life cycle gets decreased & temperature of the mobile gets increased. Due to this increased temperature the hardware of the mobile will gets affected & malfunction may happen. In our modern mobiles automatic disconnection of battery supply was[3] possible but even though its in charging condition. To overcome this by using Arduino & GSM we can prevent the overcharging of batteries & after its overcharged message will be come to your mobile to disconnect the supply.[4]

2. OBJECTIVE

The main objectives are preventing battery from overcharging and increase the battery's lifecycle. GSM Module is used to receive SMS from the connected phone which is fully charged.[5] The Arduino is used to receive a signal from GSM and to trips off the relay which is connected in circuit. It is used to disconnect the supply from phone. [6]An application which reads the current battery status of phone sends SMS to number which is inserted in GSM, when the phone is charged.

3. PROPOSED WORK

The present existing system is based on Bluetooth system for charging control applications.[7,8] The system is based on an IoT architecture which consists of: Data acquisition and processing, information, centralization and access to users. [9]The system provides current status of battery and sends message to module when it reaches 100%. This paper will help the peoples who have forget to unplug the charger during night time.

4. METHODS AND MATERIAL

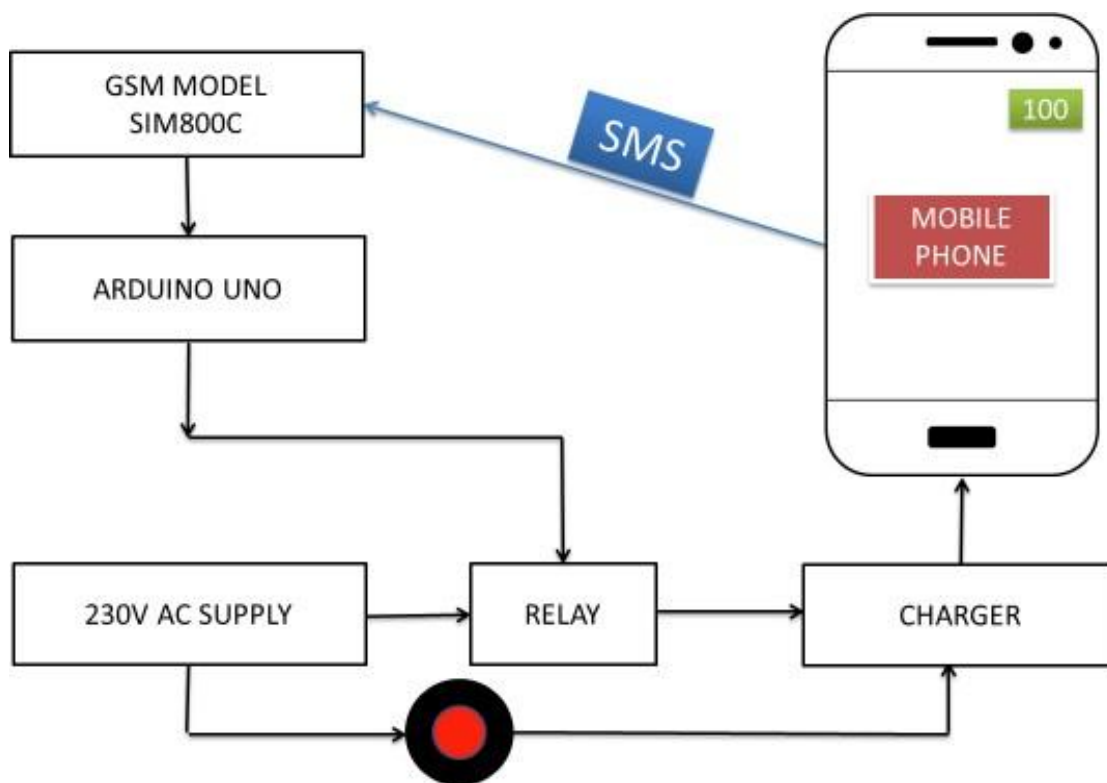


Fig.1 Block Diagram

The 230V AC supply is given through the normally open type relay. A push button is connected parallelly to the relay. [10] A 230V/12V Stepdown Transformer's primary end is serially connected to the relay. Another end is connected to bridge rectifier which is used to convert AC to DC voltage. The output of the rectifier is pulsating DC supply which is filtered by using a 16v capacitor. [11] IC 7805 and IC812 voltage regulators are connected with rectifier. The supply from rectifier is taken as the source for Arduino and GSM through the IC 7805 and IC 7812 respectively. [12] An USB port connected to the circuit which is to connect the phone for charging using USB cable. Another USB port is used to connect Arduino for supply. [13]

Arduino and GSM SIM800C are connected with transmitter and receiver pins. The transmitter end of the GSM (Tx) is connected to the receiver end of the Arduino (Rx) and the receiver end of the GSM (Rx) is

Arduino and GSM SIM800C are connected with transmitter and receiver pins. The transmitter end of the GSM (Tx) is connected to the receiver end of the Arduino (Rx) and the receiver [14] end of the GSM (Rx) is connected to the transmitter end of the Arduino (Tx). For transmitting the battery status of the mobile, we created an Application in which the number of the SIM inserted in the GSM module. The phone must be installed the above-mentioned application which is already developed to send SMS to a simcard number placed in GSM module. If battery percentage reaches predetermined value (100%), [15,16] It sends SMS to the entered number. The output pin of the Arduino is connected to the switching coil of the relay. When it receives the SMS, it transmits the signal to relay which trips off the relay, then the total circuit get powered off. By that the battery is prevent from the problems arise due to over charging. [17,18]

5. RESULTS & DISCUSSIONS

5.1. Circuit Diagram

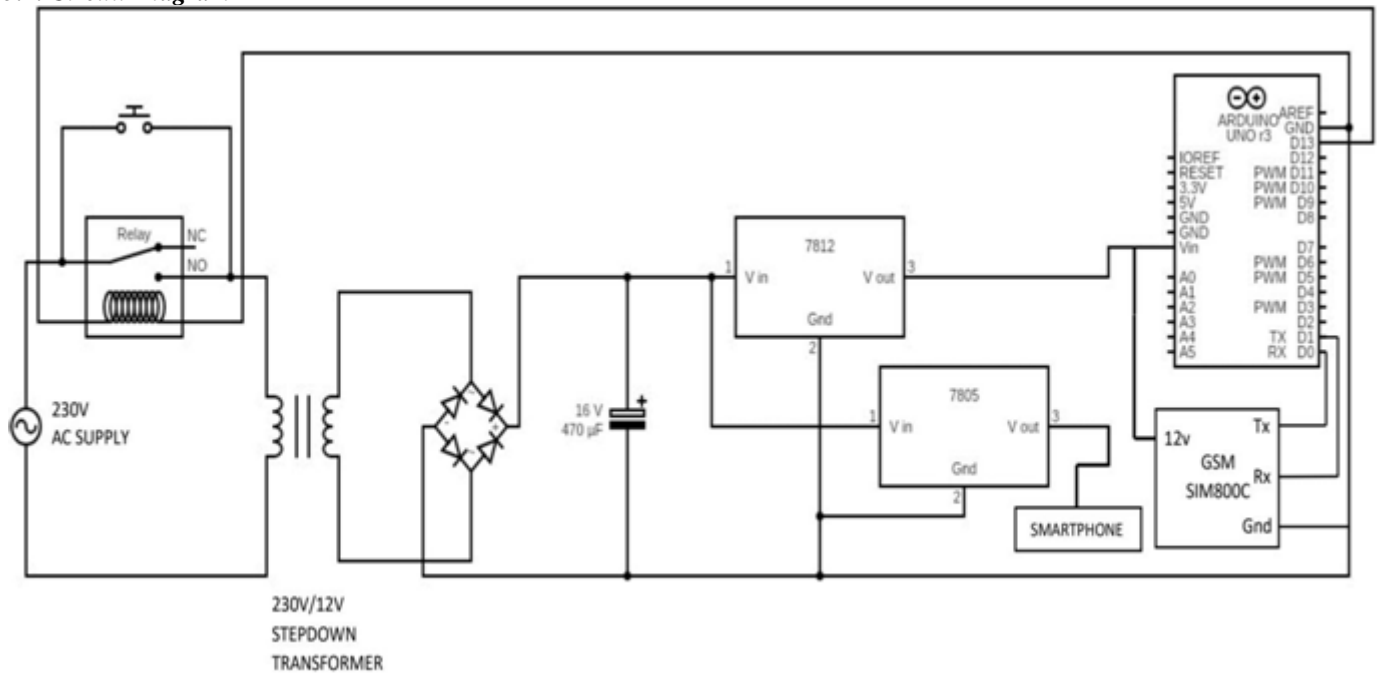


Fig 2. Circuit Diagram

5.2. Output of the system

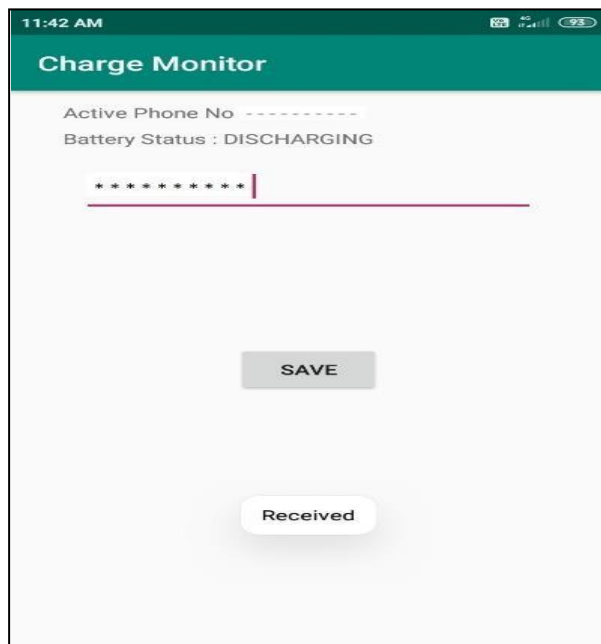


Fig.3. Initial stage in app screen before charging in screen

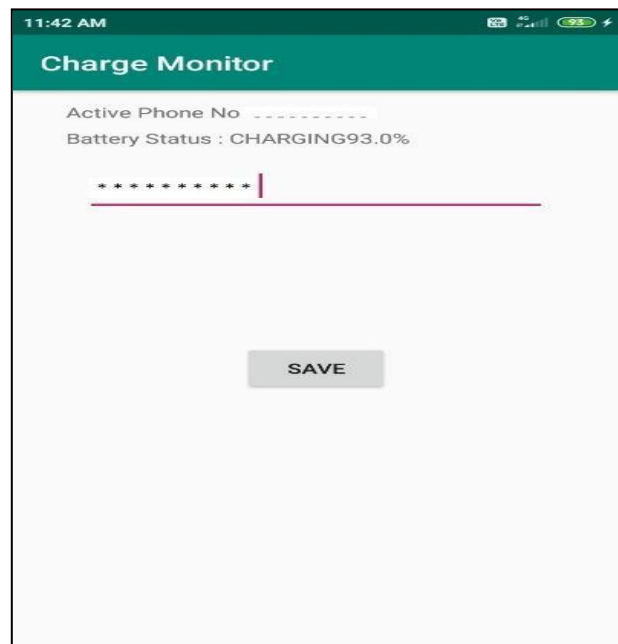


Fig.4. Connecting charger pin, displaying connecting charger pin

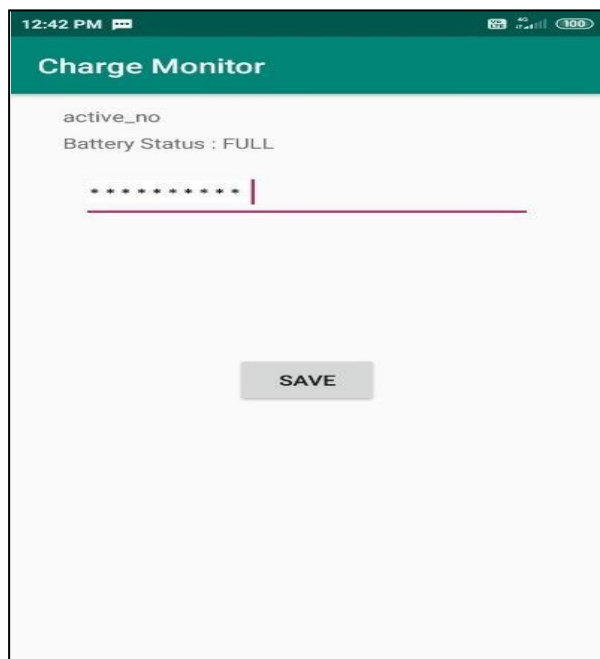


Fig.5. Indicating Battery status is “FULL”

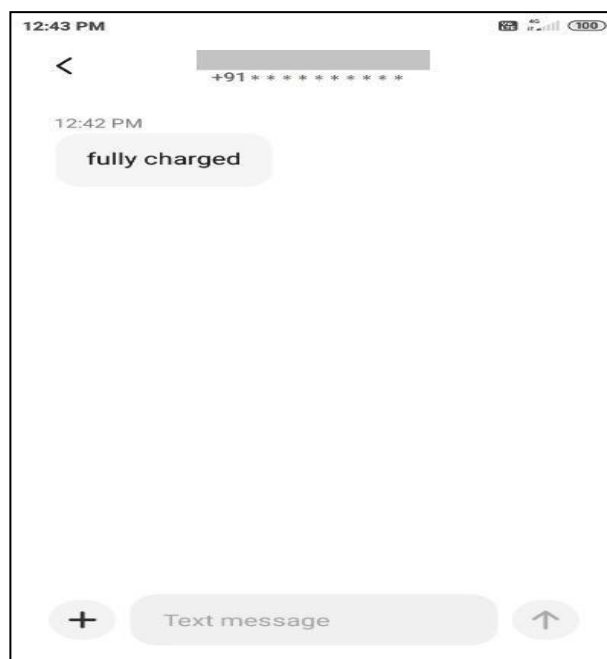
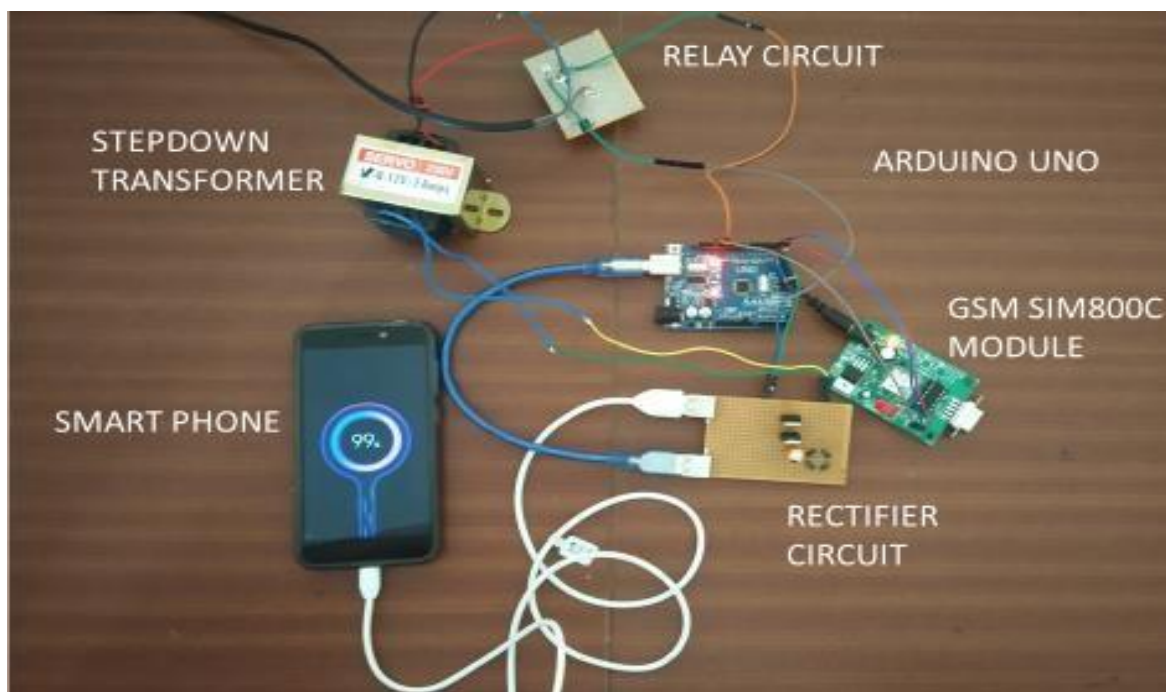


Fig.6. In messaging app screen, it shows received message “fully charged” from GSM

5.3. *Prototype of the system*



6. CONCLUSION

Using this system one can prevent the battery from overcharging and ultimately increase its lifecycle. The system is cost effective. The system would provide current battery status and intimate when its fully charged. In future smart phones gets smart charger

which is able to disconnect the supply while fully charged. The smart charger will analyze the battery life and temperature. It will be more profit able, efficient safe and environment friendly one. Thus, by the help and funding from reputed organizations a startup can be initiated.

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