"SOLAR BASED MULTIPLE MOBILE CHARGING USING VOICE INDICATION SYSTEM WITH ENERGY BACKUP"

[1]MONALI JAWADE
Department of E&TC, SSPACE, Wardha, India
monalijawade@gmail.com
[2]ASHWINI JAGTAP
Department of E&TC, SSPACE, Wardha, India
ashu.jagt@gmail.com
[3]PRITI NICHADE
Department of E&TC, SSPACE, Wardha, India
pritnichade@gmail.com
[4]PUNAM SARDAR
Department of E&TC, SSPACE, Wardha, India
sardarpunam@gmail.com
[5]PROF. S. KAMBLE
Assistant Professor, Department of E&TC, SSPACE, Wardha, India
suchitavkamble@gmail.com

ABSTRACT: *Mobile phones has a significant role in the communication as well as day to day life. The coin-based mobile battery charger developed in this project is providing a unique service to the rural public where grid power is not for partial or full daytime and a source of revenue for site providers.*

***Keywords*:** Adapters, Battery Charger, Mobile Phone, Microcontroller ATMEGA328 , LDR, LCD Display, Solar Panel, Coin Detector Sensor, Solar panel.

1. INTRODUCTION

Solar power is a source of energy which is capable of being renewed, which has become increasingly popular in modern times. There are certain advantages which overcome the problems of non-renewable energy sources, such as coal, oil and nuclear energy. It is non-polluting, reliable and has the capacity to produce energy anywhere where the sun shines, so its resources are not going to run out anytime soon. This research is get invented to control the solar panel automatically, maintains face of the solar panel towards the sun. This is happened by applying the control over the mechanical movement of the solar panel. Usually sun rises at east and sets at west. In this research the coin-based mobile battery charger is get invented which provides a unique service to the rural public where grid power is unavailable for partial or full daytime and a source of revenue for site providers. The coin-based mobile battery charger can fastly and easily installed in any business premises Coin detecting mechanism is used to detect the coin. When the user inserts the coin, this will detect the coin and send a corresponding signal to the signal conditioning unit in which the incoming signal is converted into square pulse and then given to microcontroller.

Voice indication system is used for those consumers who are uneducated and blind to understand all the features of coin box. Memory card is used for the data logs i.e. storage of information about daily consumers so that how many consumers are used the coin box in one day ,one month , one year and so on. To calculate the income to the owner and stored the information about battery charging so that how many power can be stored.

2. BASIC ASSUMPTION

- Provision to Maximum solar energy is used for charging the lead acid battery which is in the mobile battery charger and keeps all the charged.
- The charging current is up to 4.5AH @ 6vDC and this takes care of the mobiles developed by the companies like Nokia, Sony-erricson, Blackberry, HTC and many others which are of the first and second generation mobiles.
- A single solar panel having a of size of 635x550x38 mm, 37WP ahich is able to supply upto 2.0 amp is used.
- Provision to charge maximum 03 different types of mobiles is provided.

A. Solar Panel

The stepper motor controls the mechanical motion of the solar which controls through the. 3 LDR's will be placed on arch. So on the basis of the movement of sun LDR intensity will be changed where the sun light intensity is more LDR intensity will be less and on the basis of LDR intensities stepper motor will be rolled on the side where the LDR intensity is found to be less such that solar panel is also rolls. Power optimization is done by using LDR. If the surrounding light is minimum then the reading of LDR is maximum. As per

the value of LDR the ADC shows the reading. The ADC will send this value to microcontroller. As per the value released by the ADC the microcontroller glows the LED through relay. If the intensity of the light is more means all the LED array will be OFF. Depending upon the intensity of the light LED arrays will be switched ON or OFF.

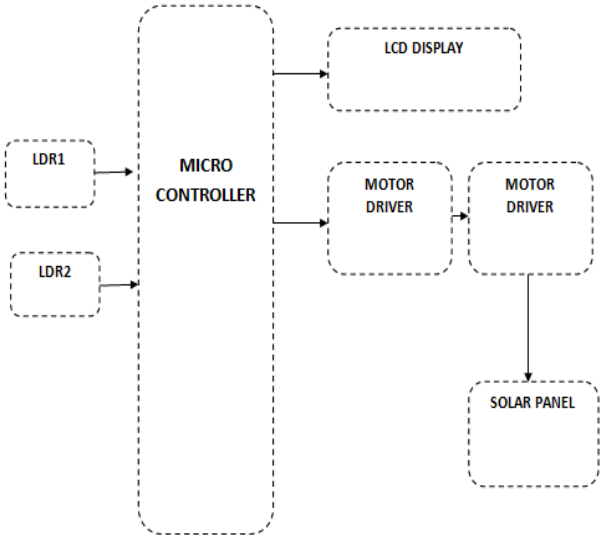


Figure 1: Block diagram of solar tracking system

Figure 2: solar tracking system

B. Power Supply

The input to the circuit is applied from the regulated power supply. The AC input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating DC voltage. So in order to get a pure DC voltage, the output voltage from the rectifier is fed to a filter to remove any AC components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant DC voltage.

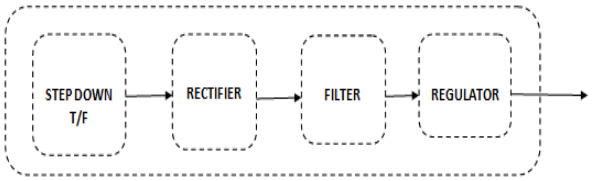


Figure 3: power supply

C. Input Stage

A mobile is get charged when its charger is connected to it, when a coin is inserted at the coin insertion slot at the time of input process. The coin type and the size will be displayed at the LCD display for the user, so as to ensure that coin inserted is correct. And if another coin is inserted in the slot will be returned to refund box. A mechanical slot is get attached to the electrical triggering where coin insertion is take place, if the correct coin is inserted, it sends a pulse to the control unit which authenticates a start of charging the mobile battery which is connected to the device. Then the coin insertion slot acquire the coin into the battery charging unit and start charging the mobile battery for a limited period which is controlled by the software of the microcontroller.

D. Controller

This section gives the details about the input signal that comes from the sensor circuit. The diameter of the coin decides whether the coin is accepted or rejected. This invokes microcontroller along with LCD interface displays the selection of mobile option if specific mobile is get selected for charging the analogous routine is activated and charge the mobile for a particular time period. As soon as the routine get completes, it means that charge complete message through LCD display. Similarly the same strategy is done for charging of more than four different mobiles simultaneously.

E. Output and Display

The LCD shows each and every information to the customer as and when needed. It put on show as " Insert Coin" when the mobile battery is connected. While charging it put on show "Charging" and at the end of charging cycle it put on show as charging is completed" and For regular charging the coin should be inserted when the display shows "Charge Completed" The output has 07 terminals for connecting different types of mobile batteries and 5 of them are internally connected to charge mobile batteries having different make as shown in Table 1 below:

Table 1: Charging Requirements of Mobile Batteries

Sr. NO.	Mobile Type	Maximum Charging Voltage(V)	Maximum Charging Current (mAh)
1	Samsung	5.7	3400
2	Sony Ericson	4.8	900
3	Nokia	4.8	1500
4	LG	5.5	2100
5	Panasonic	3.7	1200
6	HTC	5.5	1800
7	Black Berry	3.7	1300

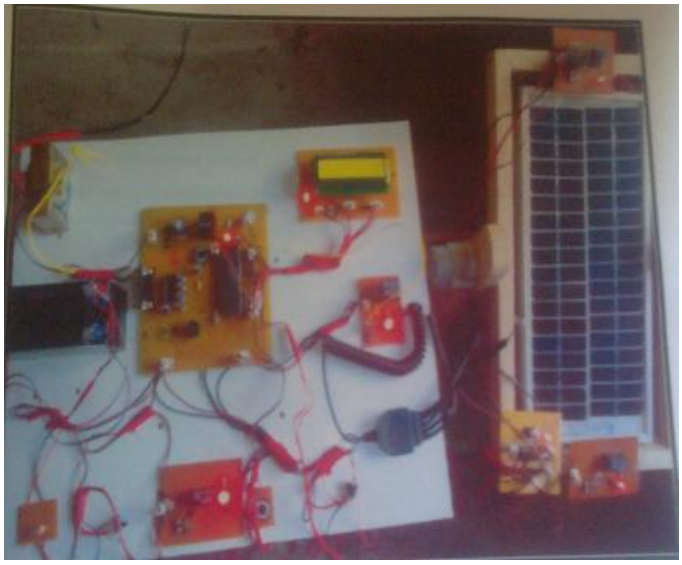
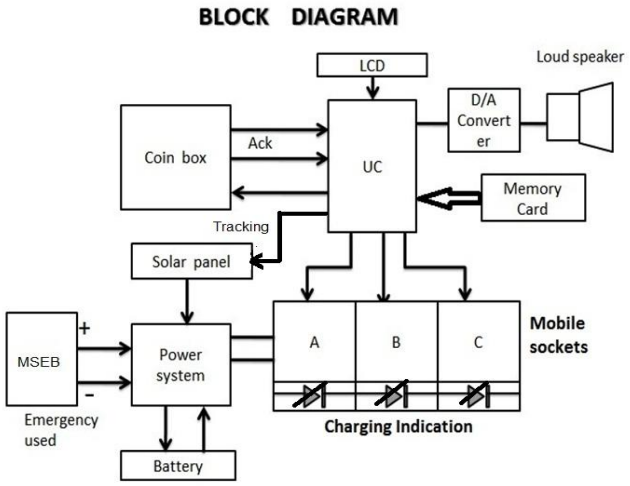


Figure 4: Hardware setup for Solar based multiple mobile charger using voice indication system with energy backup

3. WORKING



Block diagram of solar tracking system

As seen from block diagram mainly consist of a coinbox, solar panel and AVR .As coin is inserted in coin box it get detected by the IR sensor. The LCD screen will show type of coin and size as soon as IR sensor detected the coin, it will send an acknowledgement the signal to the AVR . If any other coin,IR sensor will return it to the different box.

As soon as coin get detected, charging will start LCD screen display whether the mobile is plug in or plug out. The system also consist of loudspeaker which provides indication such as “please insert coin”, “connect your device”.

System also consist of memory card which is been used for storing purpose. It stored the data such as how many unit is been consumed by consumer in within a day as over year.

The LCD display is connected to AVR and its main concerned is to display information to the customer as an when required . It displays “insert coin” , “charging”.

Solar panel used in a system is mainly for energy generation at a power system. Solar panel is been attached to the power system which connected to the battery which stored the energy and also discharged it at output level. When a mobile device is connected at output mobile socket power system is also attached to the direct power supply which can be useful in a emergency.

The system is provided with three mobile sockets output across which mobile devices is connected .The three different switches is been provided which are asign for every single socket. As the switch is press , the coin needs to inserted in a asign coin box. As a coin inserted it will show indication on LCD screen and also on loudspeaker. Charging indication through LCD and loudspeaker provides a neccesary information to the customer.

Device accept only one rupees coin which mean that if any other coin inserted it will return to the refund box. The time limit provided after inserting one rupees coin will be ten minute. The time period can be displayed on LCD screen .It also shows time indication for individual socket.When all socket are engaged. The customer can extend his time limit by inserting one rupees coin by the end of his asign time limit.

4. ADVANTAGES

5. Effectively receive large amount of energy from sun towards earth rotation
6. More useful to consume energy from sun and intelligent tracking solar energy
7. Easy and hand systematic
8. Minimum cost
9. Decreases man power
10. Low power consumption

11. APPLICATIONS

- In railway station, In bus station.
- The coin based mobile phone charger is very useful to public for using coin to charge for the mobile phone in any places.

12. FUTURE SCOPE

- In future, we will provide the online data logging system for owner
- We will save the power as well as cost by using nano technology.
  We will use the prepaid services for mobile charging.(NFC)

In this project the coin replace by the mobile swapping. When people have no coins then they swap their mobile, mobile balance is deduct with respect to percentage of charging we need. In this way it gives chance to unemployed to generate up to 1000000 jobs in our country and government earn the money ultimately and indirectly up to 2000000 per day.

13. CONCLUSION

In this work a creative method to charge mobile batteries of different manufacturer using solar power has been developed to improve rural and remote areas where the current provision is not ully available all the time. This paper is very helpful today. Because now a days the necessity of communication is very important, so every person have cell phone but all the time we doesn't bring charger along with us. When we are going for long travel we may forget to carry cell phone charger.

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9. AUTHOR PROFILE

Monali Jawade pursuing Bachelor of Engineering in Electronics and Telecommunication from Shri ShankarPrasad Agnihotri College of Engineering, Wardha, India

	**Ashwini Jagtap** pursuing Bachelor of Engineering in Electronics and Telecommunication from Shri ShankarPrasad Agnihotri College of Engineering, Wardha, India
	**Priti Nichade** pursuing Bachelor of Engineering in Electronics and Telecommunication from Shri ShankarPrasad Agnihotri College of Engineering, Wardha, India
	**Punam Sardar** pursuing Bachelor of Engineering in Electronics and Telecommunication from Shri ShankarPrasad Agnihotri College of Engineering, Wardha, India
	**Prof. S. Kamble** completed M. Tech. in Electronics and Tele-Communication from Bapurao Deshmukh College of Engineering, Wardha. Currently she is working as Assistant Professor in Shri ShankarPrasad Agnihotri College of Engineering Wardha. Her area of interest is VLSI.