

POWER GENERATION AND OPTIMIZATION USING SOLAR PANEL

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Abstract - The paper describes power Generation and Optimization by using solar .In day by day the Increase of load and demand of energy it is challenge to provide the electric power in rural areas and energy required places. Big demand of world is energy but it does not available for directly which is required .so these gap is overcome by the system which is described in these paper .To days world technology becomes Morley increasing. The design challenges in energy consumption and power optimization increases. In this paper energy consumption is proposed using "Power generation and Optimization by using solar panel" this is Implemented by using Hardware technology i.e. Arduino and Power circuit for accessing continuous power supply.

Key Words: Solar panel, MSEB, Arduino, Control circuit, LCD, Load.

1. INTRODUCTION

Day by day the technology is changes and requirement increases in all field .big demand of energy increasing in the places of where public gatherings like hospitals, industries, malls, theaters etc. in all field energy is playing important role for impressive and effective work so it is very important thing energy consumption by using renewable resources like solar energy, wind energy etc. In this system for observation and controlling purpose we use the Arduino AT mega 2560 microcontroller board. The resource used for operating the load and its power rating value display on LCD. From the both different sources either we use the Solar power energy source maximumly or as per need use MSEB power source by using power circuit, utilize for particular application .Also these system is useful for domestic and also for industrial applications.

1.1 LITERATURE REVIEW

In field of automation there are designed the different home automation by using different technologies. In case of GSM and IOT based appliances or home automation system we need to send the message / make a call to control the appliances but it is having drawback is having more delay and complexity is more. In the case of MSEB. The system has provided the supply but many times it has uncontinuity in power supply.

Some designer design the with the other power source system i.e. in solar panel power supply but it is depend on atmospheric weather condition. Some designer generate the system with the help of only battery but battery is having short life .In our design we implement the power generation system by using pure and continuous supply use of the three resources i.e. SOLAR, MSEB and BATTERY which gives continuous power and which is controlled by Arduino.

1.2 DESIGN AND IMPLEMENTATION

The Below fig. shows Power Generation system for Home and Industrial use with the help of Arduino mega. In this system we are using Arduino ATmega 2560, Solar panel, Battery, MSEB and Load (LED bulb).

2. METHODOLOGY

Implementation Diagram

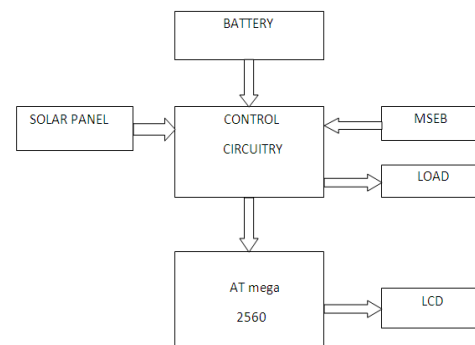


Fig 1-System Block Diagram

The Arduino Board is interfaced with the LCD. The status of power utilizes displayed on LCD and for this we can use Relay Circuitry. There are two power sources solar and MSEB. The solar panel can absorb the sun rays by using photo voltaic module (Solar PV Cells) Solar PV cells is the Combination of series and parallel arrangement and determine the output voltage of panel. The output voltage which is required for load it is provided to the power circuit and the remaining voltage is stored in battery.

It is depend on Relay circuitry to select one source either MSEB or SOLAR and output of power circuit is given to load. Here Arduino AT mega 2560 it controlling the switching then it Initialize the LCD. LCD will Read the Status of system.



Fig 2-Solar Panel

Solar panel absorbs sun rays as from source like sun and generates electricity. A photovoltaic module is set of solar cell. Solar panel contains solar array in photovoltaic module.



Fig 3- Battery

We have to selected a battery for loads so it would fulfill the load requirement.it is available at any time therefor it is very important in our system.

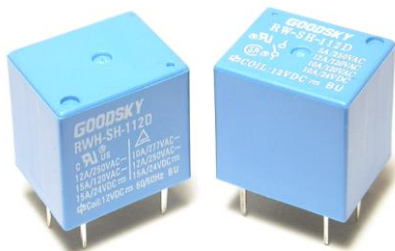


Fig 4- Relay

1. Use of relay measure in watt hour daily.
2. It also helps to detect backup time of battery
3. Relay mostly used in the switching systems.
4. It can prefer as safe.
5. It should be used as control circuitry in various systems.
6. Relays are various type 5v,12v,24v.



Fig 4-LCD Display.

LCD is a electronic display module and is very commonly used in various circuits. A16x2 is used as a basic module. These modules are preferred the reason being:LCD Economical and Easily programmable.

Advantages of LCD:

1. LCD is easily programmable.
2. Display number of character.
3. It is compact and light.
4. Power consumption is low.

The arduino is small computer programed with instructions to interact with different forms of input and outputs. The arduino is many analog and digital I/O pins it operates with 5V power supply which is connected to USB Port or External power supply. It can be function between 5V-20V.Arduino has 54 digital I/O pins to select input or output pins pin mode (). Etc



Fig 5-Arduino.

The arduino mega has many advantages. The below figure shows the comparison between Arduino and different Arduino Boards.

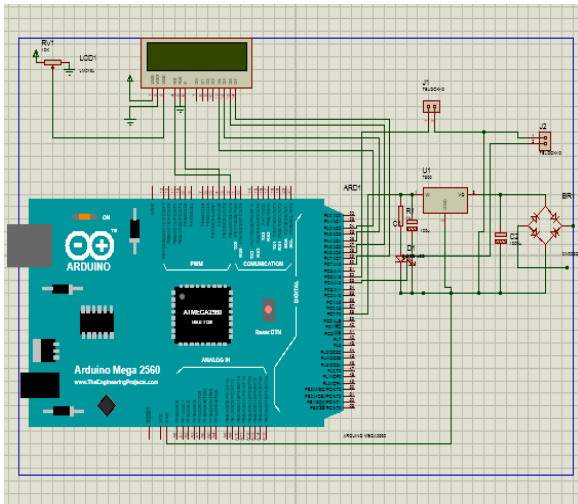


Fig 6- Circuit Diagram with LCD Interfacing.

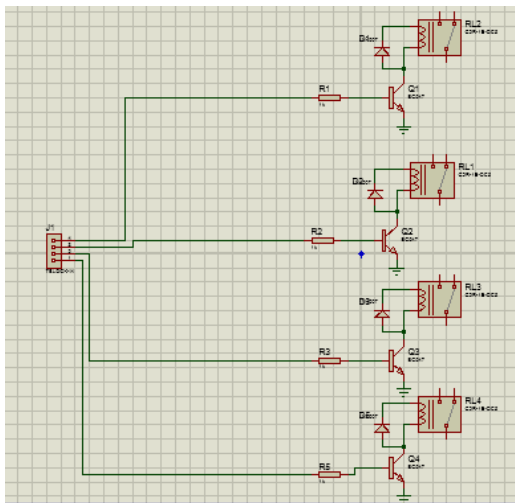


Fig 7-Control Circuitry

WORKING

There are two power sources solar and MSEB. The solar panel can absorb the sun rays by using photo voltaic module (Solar PV Cells) Solar PV cells is the Combination of series and parallel arrangement and determine the output voltage of panel. The output voltage which is required for load it is provided to the power circuit and the remaining voltage is stored in battery .It is depend on Control circuit to select one source either MSEB or SOLAR and output of power circuit is given to load. Here Arduino AT mega 2560 it controlling the switching then it Initialize the LCD. LCD will Read the Status of system.

COMPARISION BETWEEN ARDUINO MODEL

Arduino Type	Mega2560	UNO	Nano	Galileo
Digital I/O Pins	54 pins	14 pins	14 pins	14 pins
Analog Input Pins	16 pins	6 pins	8 pins	6 pins
Processor	ATmega 1280	ATmega 328	ATmega 168	Intel
Memory Size	128 KB	32 KB	32 KB	8Mbyte
Clock Speed	16 MHz	16 MHz	16 MHz	400 MHz
Cost	Normal	Cheap	So Cheap	Expensive

Fig 8- COMPARISION BETWEEN ARDUINO MODEL.

Algorithm

Initialize Arduino ATmega 2560

Initialize solar panel.

Initialize MSEB supply

Initialize Battery.

Solar power supply is on with the help of Arduino AT MEGA control circuitry run the load.

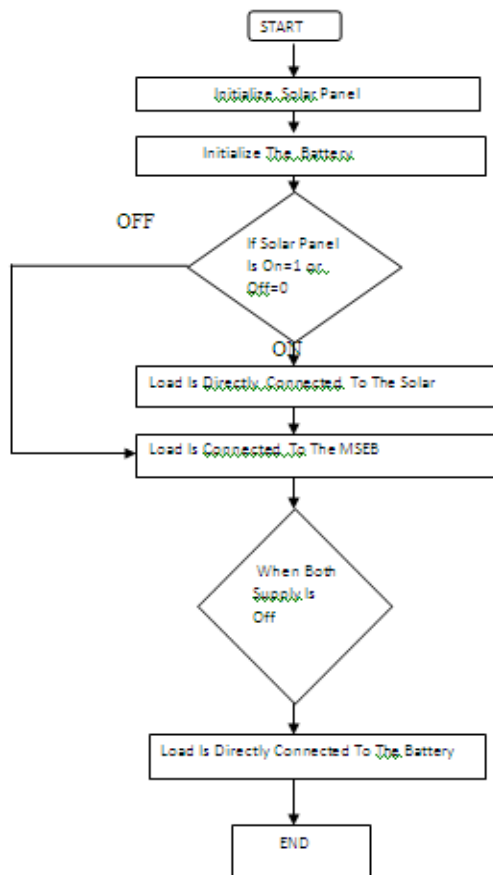
If solar supply is off then control circuitry select supply from MSEB.

If both the supply is off control circuitary automatically select supply from battery

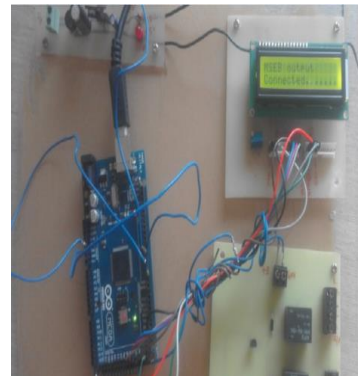
Selected supply given to load

Load is running on which type of supply it is display on LCD.

FLOWCHART

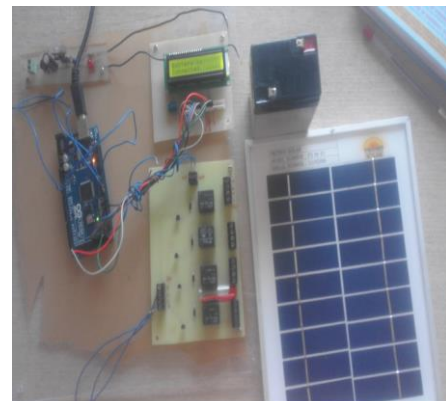


MSEB POW



Due to changing atmospheric conditions some time solar remains off at that condition load is directly connected to MSEB shown in above result.

BATTERY



Continuity in power sources is most important in highest applications. by default some technical defects occur MSEB and SOLAR supply is OFF in this condition our system gives preference for other resource i.e. BATTERY . and load is automatically connected to battery.

RESULT AND DISCUSSION

In this proposed the main objective is to generate the power by maximum use of SOLAR and gives the continuous supply for running load and also this power use for different applications like Home appliances , Industrial use , Malls and Campuses etc .

SOLAR PANEL



Highest priority given to solar panel so firstly in above result more preference given to solar and load are automatically connected to solar panel.

3. CONCLUSIONS

This project proposes a low cost, secure, universally accessible, autoconfigurable. The approach discussed in the paper is original & has achieved continuity in power supply. The proposed system is better from the scalability and flexibility point of view than the commercially other systems. Under the circumstance of power failure this system keeps the continuity of supply without producing any noise pollution dislike any other power generating equipment.

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