

Synchronization of Solar and MSEB

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Abstract---In this paper we are providing a overview of recent researches synchronization of solar and MSEB. The term “smart grid” refers to the use of technologies and tools that help electric utilities better meet consumers’ needs reliably and affordably by more effectively monitoring power usage demand and system conditions on a near real-time basis. The smart grid combines digital devices, software applications and two-way communications that allow utilities to track the flow of electricity with great precision, and apply logic to relays according to the situation of input. It can also let utilities record consumer electric use in various time intervals and provide consumers with energy usage data. Considering the problem of generation of the ac supply, we aim to design a system, which can utilize the solar power. Due to the use of solar power for home appliances requirement of grid’s power will be reduced. This system results into the efficient use of renewable energy. This system will be used to overcome the problem of load shedding and reducing the electricity bills.

The system consisting of solar dc power can be converted into ac power using the solar micro grid inverter. The synchronized output is given to the microcontroller and the source of supply will be selected automatically according to the requirements of load and status of the sources. Advanced facility like GSM will allow the user to control various appliances just through a message. Daily report of usage of power through individual source will be given to the user by a text message. Various parameters like voltage, current, power consumption will be displayed on a LCD to give the notification of status of the system

Keywords---Smart Grid, GSM, Synchronized, Load.

I. INTRODUCTION

Considering the problem of generation of the ac supply we can design a system which can utilize the solar power. Due to the usage of solar power for home appliances will reduces the usage of ac mains. This system results into the efficient use of renewable energy. This system will be used to overcome the problem of load shedding and reducing the electricity bills.

The system consist of solar dc power can be converted into ac power using the solar micro grid inverter. The synchronized output is given to the microcontroller and the source of supply will be selected automatically according to the requirements of load and current status of the sources. Advanced facility like GSM will allow the user to control various appliances just through a message. Daily report of usage of power through individual source will be given to the user by a text message. Various parameters like voltage, current, power consumption will be displayed on a LCD to give the notification of current status of the system.

II. PROBLEM STATEMENT

To design the system which will provide an economical and smart way of operating electrical power. With the use of solar energy, we have accomplished to make this system more efficient than the traditional system.

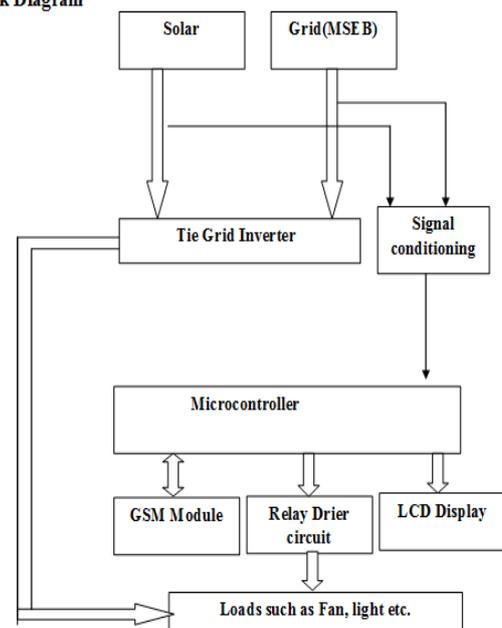
III. SYSTEM ARCHITECTURE

SOLAR And MSEB both provide 230(volt's) power .as a combination of both solar power and mseb power is

supplied to the load. current transformer and potential transformer are used to step down the current and voltage as required by LPC2148 as it can sustain upto max 3.5V , LCD is used to display the current, voltage, power, energy consumed.

GSM is used to provide the user, power consumed on regular basis i.e. user bill on the registered mobile.

Block Diagram

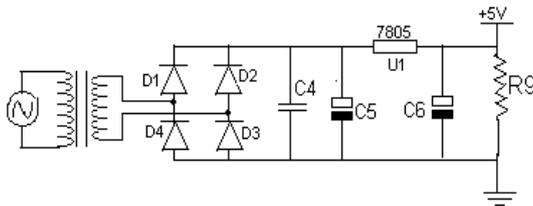


(1.1 basic block diagram)

SOLAR and MSEB both provide 230(volt's)power. And as a combination of both solar power and MSEB power is supplied to the load. Current transformer and potential transformer are used to step down the current and voltage as required by LPC2148 as it can sustain voltage up to 3.4v.LCD is used to display current, voltage, power, energy consumed.GSM is used to provide the user, power consumed on regular basis ie.user bill on the registered mobile.

IV. HARDWARE USED

1) Power supply

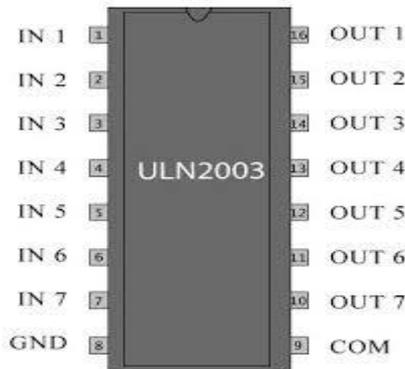


(1.3 power supply module)

This is the first unit of our system. It mainly provides the power supply requirements to each block. In any system there are 5 or 6 different components

which requires power for their operations. power supply mainly gives the ac mains of 230 volts which is then converted into dc supply and different voltages.

2)ULN2300



The **ULN2003A** is an array of seven NPN Darlington transistors capable of 500mA, 50V output. It features common-cathode flyback diodes for switching inductive loads. It can come in PDIP, SOIC, SOP or TSSOP packaging.[1][2] In the same family are ULN2002A, ULN2004A, as well as ULQ2003A and ULQ2004A, designed for different logic input levels.The UNL2003A is also similar to the ULN2001A (4 inputs) and the ULN2801A, ULN2802A, ULN2803A, ULN2804A and ULN2805A, only differing in logic input levels (TTL, CMOS, PMOS) and number of inputs.[3]

3)GSM



GSM (Global System for Mobile Communications, originally Groupe Spécial Mobile), is a standard developed by the European Telecommunications Standards Institute (ETSI).It was created to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones and is now the default global standard for mobile communications – with over 90% market share, operating in over 219 countries and territories.

4)ARM7



It represents generation of ARM Processor design. Due to their tiny size and low power consumption these micro controllers are ideal for the application where miniaturization is the key requirement. It is general purpose 32 bit microprocessor with ISP or IAP. The LPC 2148 ARM-7 IC is used here. It is based on principle Reduced instruction set computer (RISC).

5)SOLAR



Solar power is the conversion of sunlight into electricity, either directly using photovoltaics (PV), or indirectly using concentrated. Concentrated solar power systems use lenses or mirrors and TRACKING SYSTEMS to focus a large area of sunlight into a small beam. Photovoltaics convert light

into an electric current using the photovoltaic effect. Solar photovoltaics and concentrated solar power would contribute about 16 and 11 percent, respectively, of the worldwide electricity consumption, and solar would be the world's largest source of electricity.

5)MSEB



Maharashtra State Electricity Board (or MSEB) is a state-owned electricity regulation board operating within the state of Maharashtra in India. The MSEB was formed on 20 June 1960 under Section 5 of the Electricity (Supply) Act, 1948. In 1998 it was the second largest electricity generating utility in India after National Thermal Power Corporation.

V. CONCLUSION

economical and smart way of operating electrical power. With the use of solar energy, we have accomplished to make this system more efficient than the traditional systems. The GSM module has helped us providing two-way communication.

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