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SMALL SCALE POWER BACKUP CUM HYBRID MOBILE CHARGER

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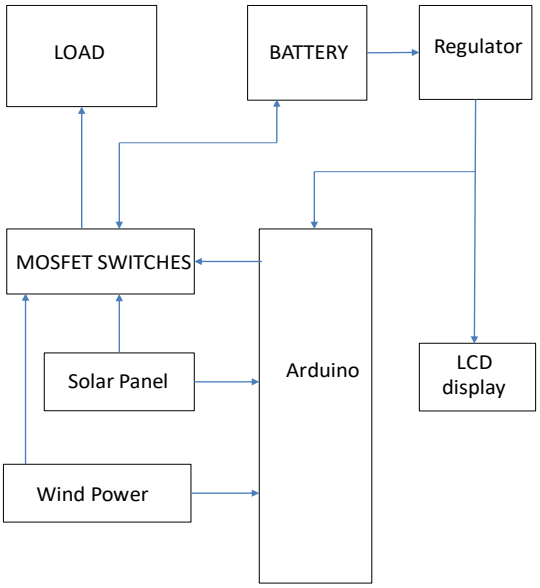
ABSTRACT
The purpose of this project was to design a portable and low cost power system that combines both wind electric and solar electric technologies. This system will be designed in efforts to develop a power solution for remote locations such as rural and research areas as well as improve the general well-being of individuals in developing countries affected by natural disasters. This project is depends on the renewable energy source like, wind and solar. From this project we reduce the voltage variation problem of the electricity generation from
wind mill and solar output

INTRODUCTION
As the energy demand is increasing in the world at an exponential rate, the search for energy sources other than fossil fuels is not a luxury anymore. Even though the fossil fuels give a temporary solution to this energy crisis, they cause the emission of carbon dioxide and other greenhouse gases, which are dangerous to the environment The output of a solar-wind system is not certain. One Might give more power and other might give less or no power
For the past few years, Engineers have been developing small power systems that can be used in locations where there is no electricity or in locations that suffer constant power outages. Different from a generator which is too heavy, too loud and requires fuel these companies are focusing on small hybrid systems that use only the sun and the wind to generate electricity. Unlike a generator, a hybrid system uses clean energy, runs quietly and can be easily transported when compared to standard systems.

LITERATURE SURVEY
As the world becomes more concerned about its environment, pollution and energy, countries are beginning to switch to renewable energies. Energy is essential to us to ensure our quality of life but the increasing cost of energy and environmental concerns are necessary to look for alternative sources. We will evaluate two systems, solar panel systems and solar and wind hybrid system (our system).
A small solar panel system can be a reliable and pollution-free producer of electricity for a home or office and is cost-effective. Several companies offer these off the shelf such as SunPower Corporation or SunForce Products Inc. These products are affordable and use both direct and scattered sunlight to create electricity to the home. However, the amount of power generated by this system depends on how much of the sun's energy reaches it. Hybrid power systems, which use solar and wind are an increasingly preferredalternatives for several reasons.
Our hybrid systems are stand-alone systems, which operate "off-grid" -- not connected to an electricity distribution system. For the times when neither the wind nor the solar systems are producing, our hybrid

system can provide power through batteries and/or an engine generator. In conclusion, a small "hybrid" electric system that combines wind and solar technologies can offer several advantages over either single system.

BLOCK DIAGRAM



Component Details

- **SOLAR PANEL**

A solar cell is a solid state electrical device that converts the energy of light directly into electricity by the photovoltaic effect Assemblies of cells used to make solar modules which are used to capture energy from sunlight, are known as solar panelsPV systems burn no fuel and have no moving parts hence, they are clean and silent and producing no atmospheric emissions of greenhouse gases. In the proposed work, the solar panel generates different voltage in different time.

Solar Panel

For this design, we will be using a solar a 100w Solar Panel made by Renogy. Renogy uses top quality solar cells and superior accessories to produce high performance solar module

SOLAR SYSTEM

Solar PhotovoltaicModule

Model: Eldara 50
Manufactured By: Vikram Solar Pvt Ltd, Kolkata
The solar panel used here is Vikram Solar Energy's solar panel under Standard Test Condition (STC), with 50W maximum output power. At STC condition of 25º temperatures, and irradiance of 1000 W/m, the panel is simulated to give an output voltage of 22V. The design parameters of the solar system are listed in Table
Design Parameters of Solar System

Rated maximum power	Pmpp	50W
Open circuit voltage	Vac	21.77V
Short circuit current	Isc	3.04A
Rated voltage	Vmpp	17.89V
Rated current	Impp	2.8A
Solar Radiation Rate	SRR	1000W/M^2
Antimiradation	AM	1.5
Ideal Temperature	IT	25 deg.clc

- **WIND MILS**

The term "wind energy" describes the process by which the wind is used togenerate mechanical energy or electricity. Wind turbines convert the motion of the wind into mechanical energy. Mechanical energy generator can convert this mechanical energy into electricity
Wind mill is used to Renewable energy is generally electricity supplied from sources, such as wind power, solar power, geothermal energy, hydropower and various forms of biomass. These sources have been coined renewable due to their continuous replenishment and availability for use over and over again.

Wind mill

The popularity of renewable energy has experienced a significant upsurge in recent times due to the exhaustion of conventional power generation methods and increasing realization of its adverse effects on the environment.

- **3.2.1CONFIGURATION OF WIND MILL**

Rotation Axis	Vertical
Model	Small Wind turbine
Material	Ms
Height of wind mill	6ft
No. of Blades	2
Blade Height	4ft
Output voltage	12V
DC generator	12V,500RPM

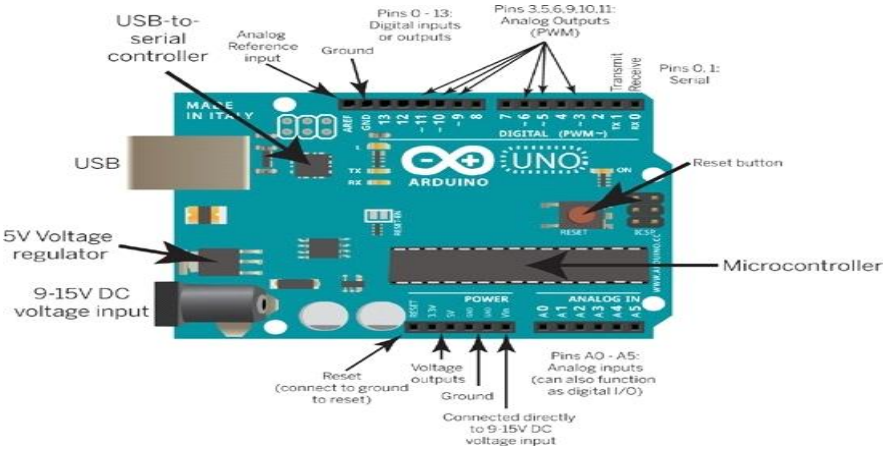
- **LCD DISPLAY:**

LCD Display

LCD indicates different mode settings & set point adjustment. Also 16 char are divided to indicate speed output. The LCD Display used here is 16 character by 2 line display. The 16 characters in both lines are equally divided to indicate commands and speed. In sub routines 'Enter Speed' and 'Current Speed' message, set Speed value is indicated on screen.
In our project LCD is interfaced with the port-0 (D0-D7) i.e. from pin number 32 to pin number 39. In other words the data-bus D0-D7 is connected to port-0 of IC 89s52. Pin RS is directly connected to Pin11 of controller and one more another important pin EN (LCD enable) is directly connected to pin 14 of the controller. On the other hand pin R/W of LCD is connected to ground. The LCD interfacing is done here for indicating various display messages for the user.

- **ARDUINO**

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.
The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible pack



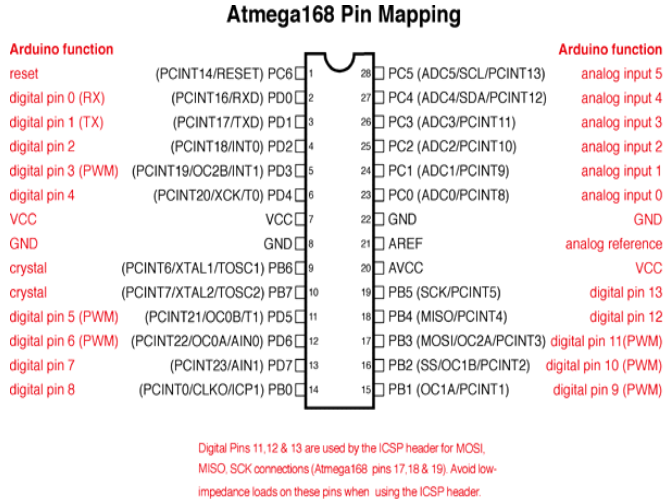
Arduino

The Uno is one of the more popular boards in the Arduino family and a great choice for beginners. We'll talk about what's on it and what it can do later in the tutorial.
Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and

professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

ARDUINO PIN DIAGRAM

A typical example of Arduino board is Arduino Uno. It consists of ATmega328- a 28 pin microcontroller.



Pin diagram

DESCRIPTION OF PIN DIAGRAM

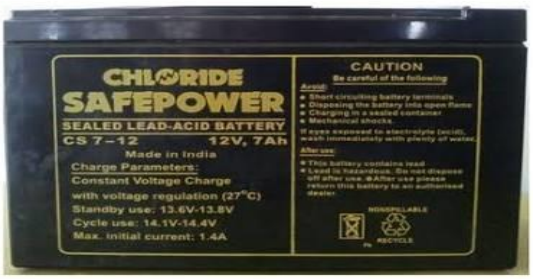
Arduino Uno consists of 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button

POWER JACK: Arduino can be power either from the pc through a USB or through external source like adaptor or a battery. It can operate on a external supply of 7 to 12V. Power can be applied externally through the pin Vin or by giving voltage reference through the IORef pin.

DIGITAL INPUTS: It consists of 14 digital inputs/output pins, each of which provide or take up 40mA current. Some of them have special functions like pins 0 and 1, which act as Rx and Tx respectively , for serial communication, pins 2 and 3-which are external interrupts, pins 3,5,6,9,11 which provides pwm output and pin 13 where LED is connected.

ANALOG INPUTS: It has 6 analog input/output pins, each providing a resolution of 10 bits.
ARef: It provides reference to the analog inputs
Reset: It resets the microcontroller when low.

BATTERY



Battery

BATTERY SPECIFICATION

- 12-volt battery
- 7amp hour rating
- 1.4amp Maxi. Initial current
- 13.6v-13.8v standby use
- 14.1v-14.4v cycle use

ADVANTAGES

- No pollution, no noise and deadly against environment pollution.
- Very high reliability and long term sustainability.
- Low maintenance cost.
- Clean, pure and high energy output.
- Provides un-interrupted power supply to the equipment.

DISADVANTAGES

The disadvantages of power generation by solar-wind are as follows:

- Large number of harmonics is produced.
- Initial investment is more.
- Large space is required for larger generations.
- Wind energy systems are noisy in operation; a largeunitcan be heardmany kilometers away.
- Efficiency is less than conventional power plants.

CONCLUSION

The extension of utility grids is not feasible and the total dependence on imported fossil fuels is economically unaffordable, fuel transport costs become prohibitive. So with this project, the rural areas get lightened. It also satisfies the increasing demand of electricity. It reduces the dependence on one single source. Hence we improve the efficiency of the system as compared with their individual mode of generation.

In this project, the rural areas get lightened. It also satisfies the increasing demand of electricity. It reduces the dependence on one single source. Monitoring the parameters of hybrid system. Hence we improve the efficiency of the system as compared with their individual mode of generation. By Automatic and real time parameter monitoring the power handling capacity increased

RESULT

By performing the experiment on Hybrid system consisting of horizontal structure wind mill and solar panel .wind mill consist of D.C generator of output 12 v at 500 rpm and solar panel of 50 w. we get constant output voltage and parameters such as voltage ,current and power.

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