WELCOME

To Our Presentation

Group: G-44

Department of Mechanical Engineering,
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CONSTRUCTION AND PERFORMANCE TEST OF SOLAR HOME SYSTEM

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Introduction

With the increasing concern about the non-renewable energy sources, constant increase in the prices of fossil fuels, global warming and damage to environment and ecosystem, the renewable energy is becoming more popular. Among the renewable energy sources, the energy through photovoltaic effect is being considered as the most essential and sustainable energy resource. Nowadays photovoltaic system are likely recognized & widely utilized for different types of power system applications. These systems can generate direct current electricity without any environmental impact. The PV system is static and free of moving parts which make it easy for operation and also requires less maintenance.

Objectives

Main objective of our project are given bellow:

- To Produce electricity from Renewable Energy resources like Solar Energy.
- To Make a Solar home system.
- To Make a solar powered inverter.
- To Make a different types of circuit such as charging control circuit, Inverter Circuit, AC Supply Circuit.
- Reduce Environmental Pollution.

Equipment's

Microcontroller:

A microcontroller is a compact microcomputer designed to govern the operation of embedded systems. A typical microcontroller includes a processor, memory, and peripherals.

Voltage Regulator:

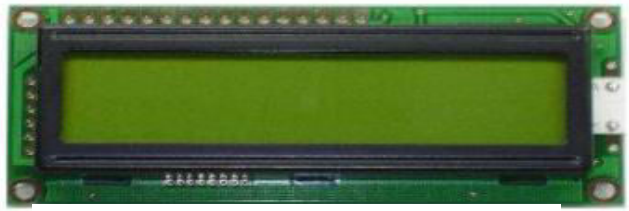
L78 Series of fixed output voltage regulators are useful in a wide range of applications within the electronics Industry.

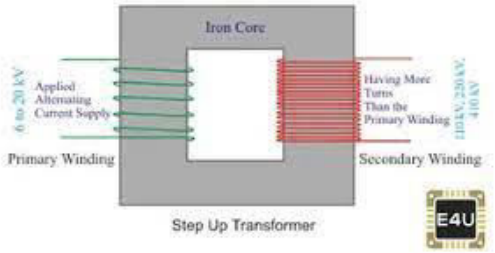
LCD Display:

It is an electronically-modulated optical device made up of any number of pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in color or monochrome.

Transformer:

A transformer that increases the voltage from primary to secondary (more secondary winding turns than primary winding turns) is called a step-up transformer





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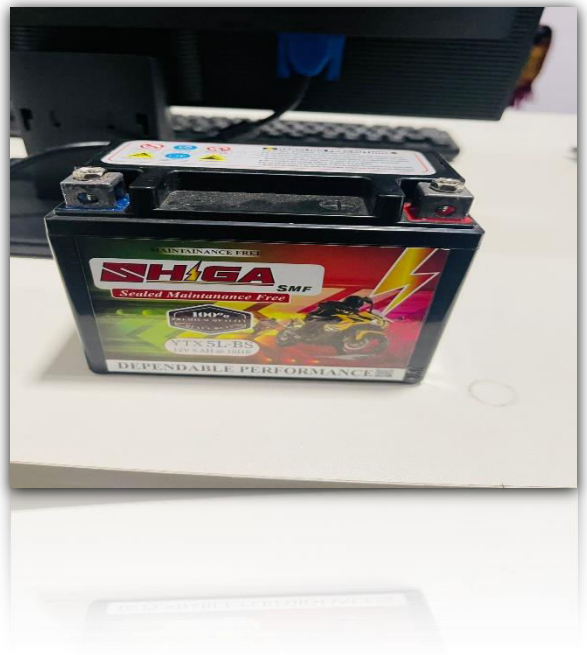
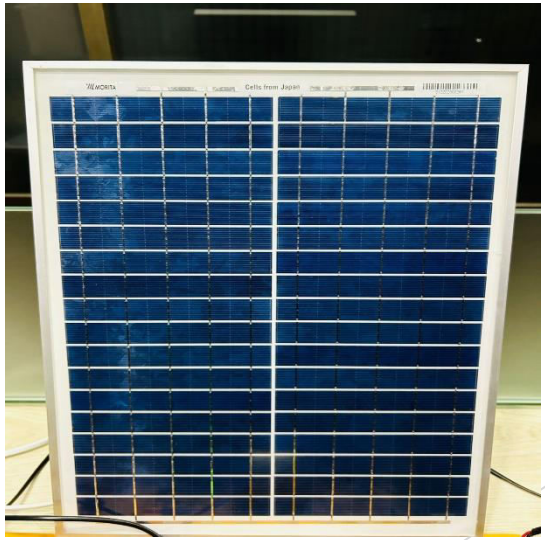
Battery:

An electric battery 12V, 5 amp is a device consisting of one or more electrochemical cells with external connections provided to power electrical. It uses for storage energy and provide desire voltage for operation.



Solar panel:

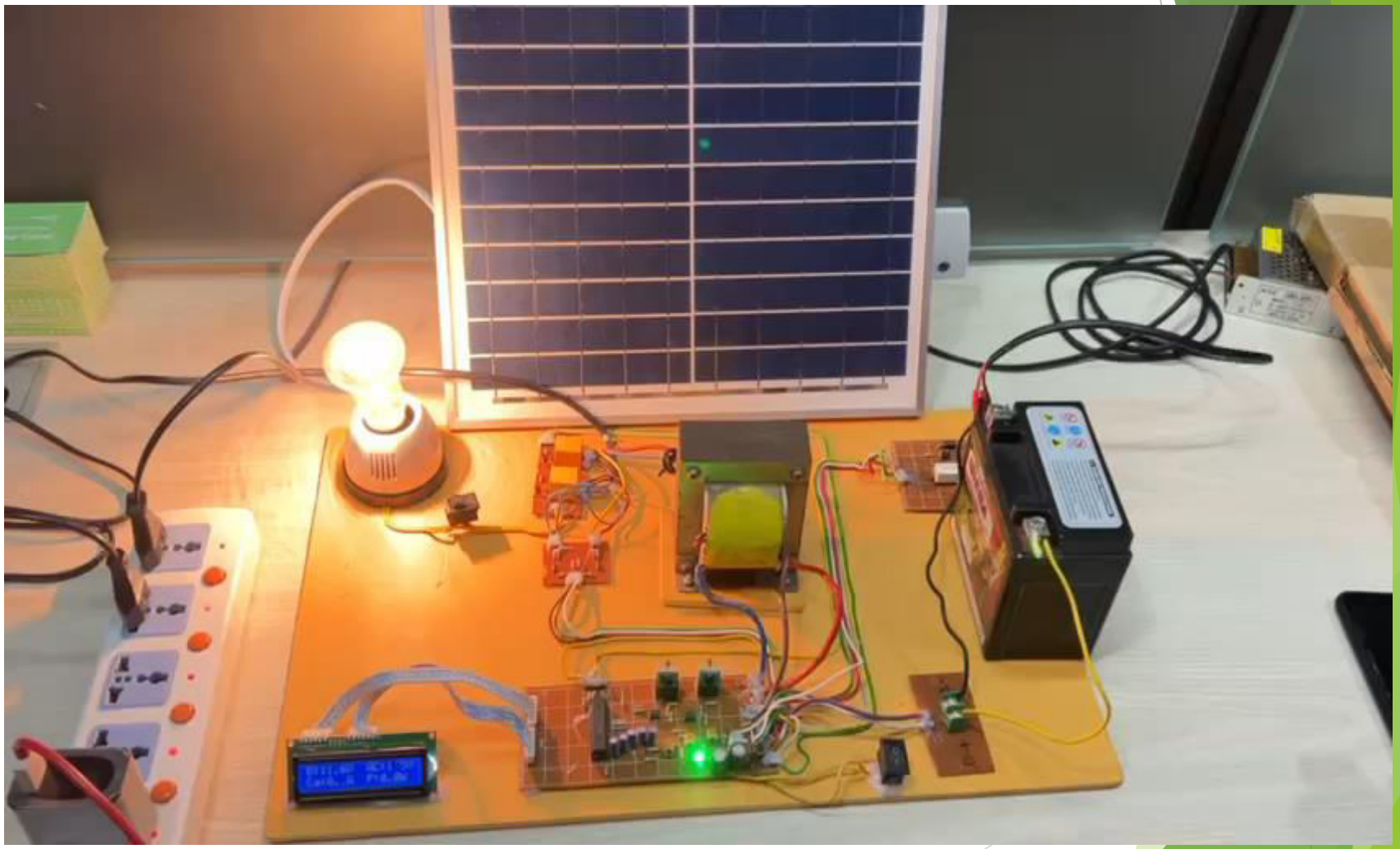
A solar panel is a device that converts sunlight into electricity by using photovoltaic (PV) cells. PV cells are made of materials that generate electrons when exposed to light. The electrons flow through a circuit and produce direct current (DC) electricity, which can be used to power various devices or be stored in batteries.



Working Procedure:

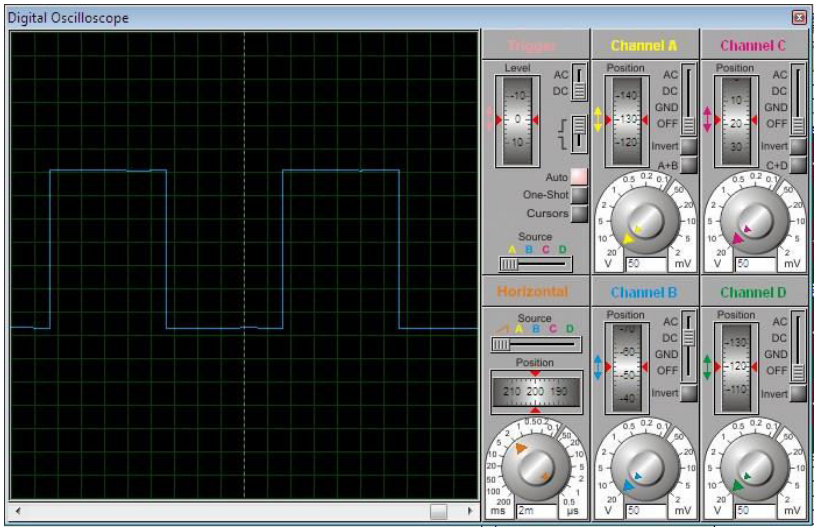
- It works by taking the variable direct current from the solar panels and changing it into alternating 120V/240V or alternate current output.
- Solar panel PV module generate DC. Once the energy is produced, it is stored in a battery for later use.
- When the energy gets sent to the inverter, it is usually in the direct current format. However, home requires an alternate current. The inverter gets hold of the energy and runs it via a transformer, consequently spitting out an alternate current output by Mosfets.
- This circuit runs and operate by microcontroller.

Project Demo Video



Wave Oscillation Curve

Square Wave Output Sample



Square Wave Output Practically

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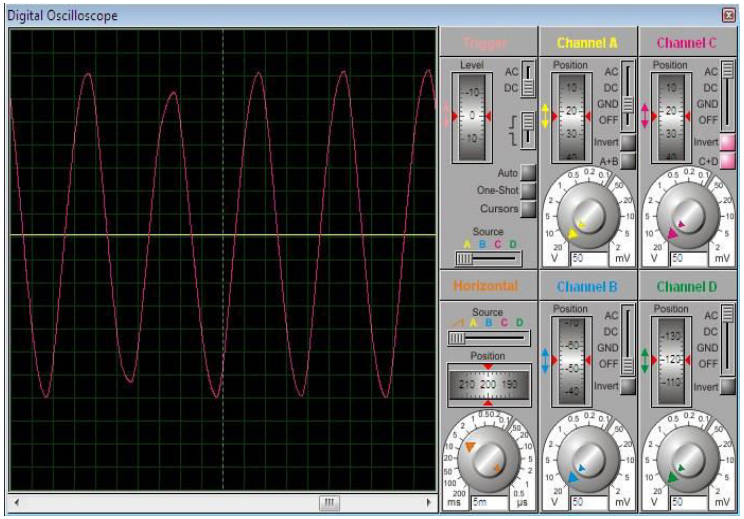
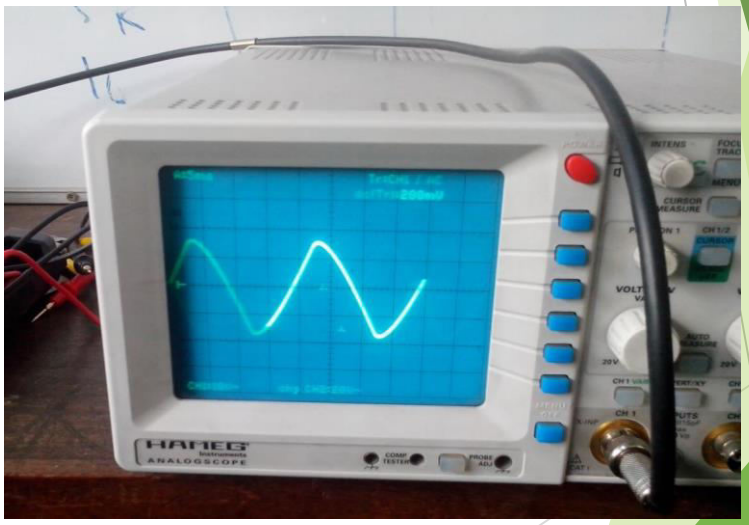
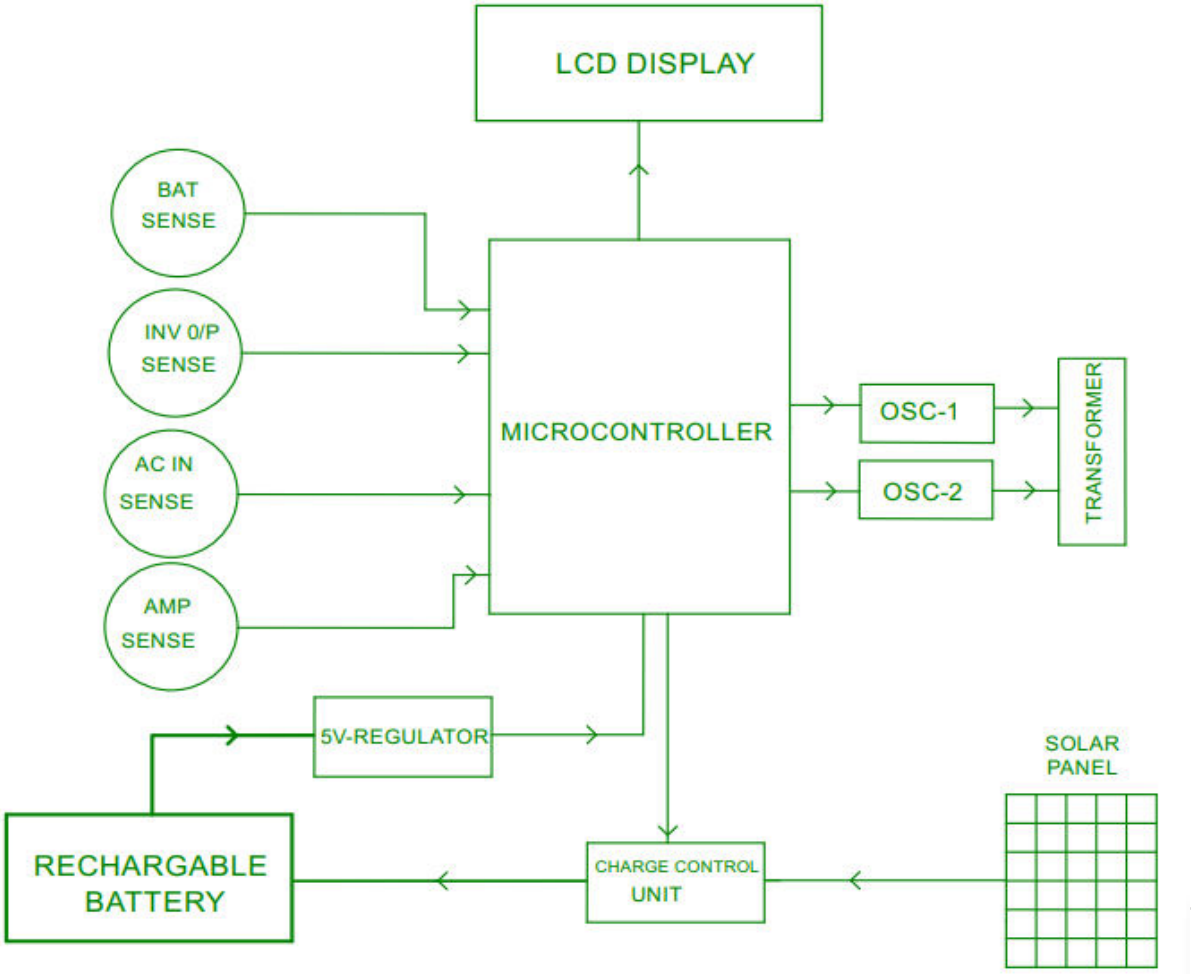
Sine Wave AC Output Sample



Sine Wave AC Output Practically



Block Diagram



Advantage and Disadvantage

Advantage

- Cost efficient.
- Reduce pollution.
- Low maintenance.
- Power management.
- Automatic system.

Disadvantage

- Solar energy is only available during day time.
- Frequency adjusting is difficult

Applications

- Solar inverter helps in DC power source utilization.
- Solar inverter can be used for domestic application.
- HVDC power transmission can be done.
- Electric vehicle drives can be run through solar inverter.
- Solar inverter can be used in industrial application.

Conclusions

solar hybrid inverter consist of solar panel ,controller , inverter & batteries , all of which can function independently without utility power.

The wind solar hybrid system are now being used widely in different fields , like street lighting , traffic, telecommunications base, large scale billboards & home power.

Any questions ?