VISHNU INSTITUTE OF TECHNOLOGY

Vishnupur, Bhimavaram, Andhra Pradesh - 534202
(Approved by A.I.C.T.E. & Affiliated to J.N.T.U Kakinada)
(Accredited by NBA & NAAC 'A' Grade)

Department of Electrical and Electronics Engineering

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Vishnupur, BHIMAVARAM – 534 202
Department of Electrical & Electronics Engineering

VISION AND MISSION OF THE DEPARTMENT

VISION:

To be recognized as a Centre of Excellence in the field of Education and Research so as to produce Competent & Ethical Engineers capable enough to contribute to the society.

MISSION:

- To develop innovative, efficient and proficient electrical engineers.
- To keep the curriculum industry friendly, with due regard to the University curriculum.
- To be a place for innovative blended learning and entrepreneurship development in multidisciplinary areas.
- To promote ethical and moral values among the students so as to make them emerge as responsible professionals.

PROGRAM EDUCATIONAL OBJECTIVES (PEO's)

PEO1: To produce Electrical and Electronics Engineering graduates who have strong foundation in Mathematics, Sciences and Basic Engineering

PEO2: To provide intensive training in problem solving, laboratory skills and design skills to use modern engineering tools through higher education and research.

PEO3: Ability to pursue higher studies and to seek employment in a variety of engineering technology positions and work successfully in their chosen career aspirations and generate entrepreneurs.

PEO4: To inculcate in students professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context through life-long learning.

INDEX

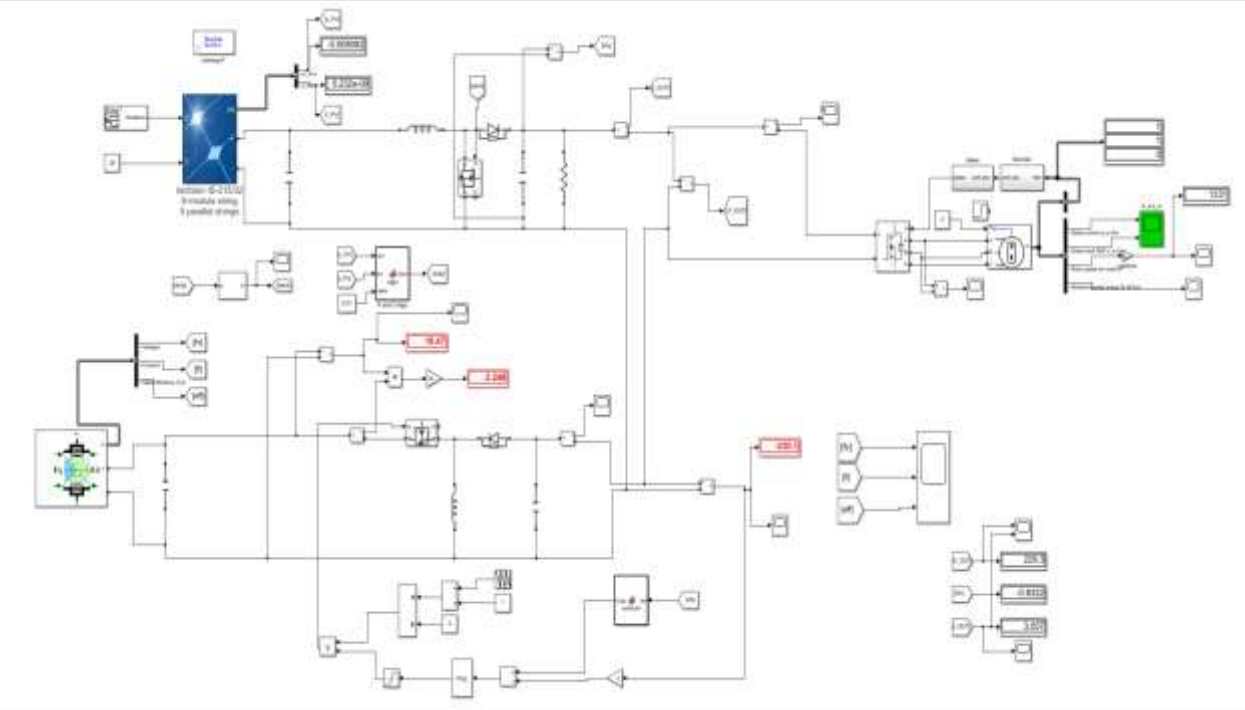
1 MODELLING AND SIMULATION OF A SOLAR POWER SYSTEM WITH FUEL CELL

P. SAI VENKATA KRISHNA, V. RAHUL, R. YASWANTH SAI LAXMAN, V. JAWANTH, T. SRINU BABU
SUPERVISOR: Mrs. I. V. V. VIJETHA, M. TECH, (Ph.D.).

OBJECTIVE OF THE PROJECT:

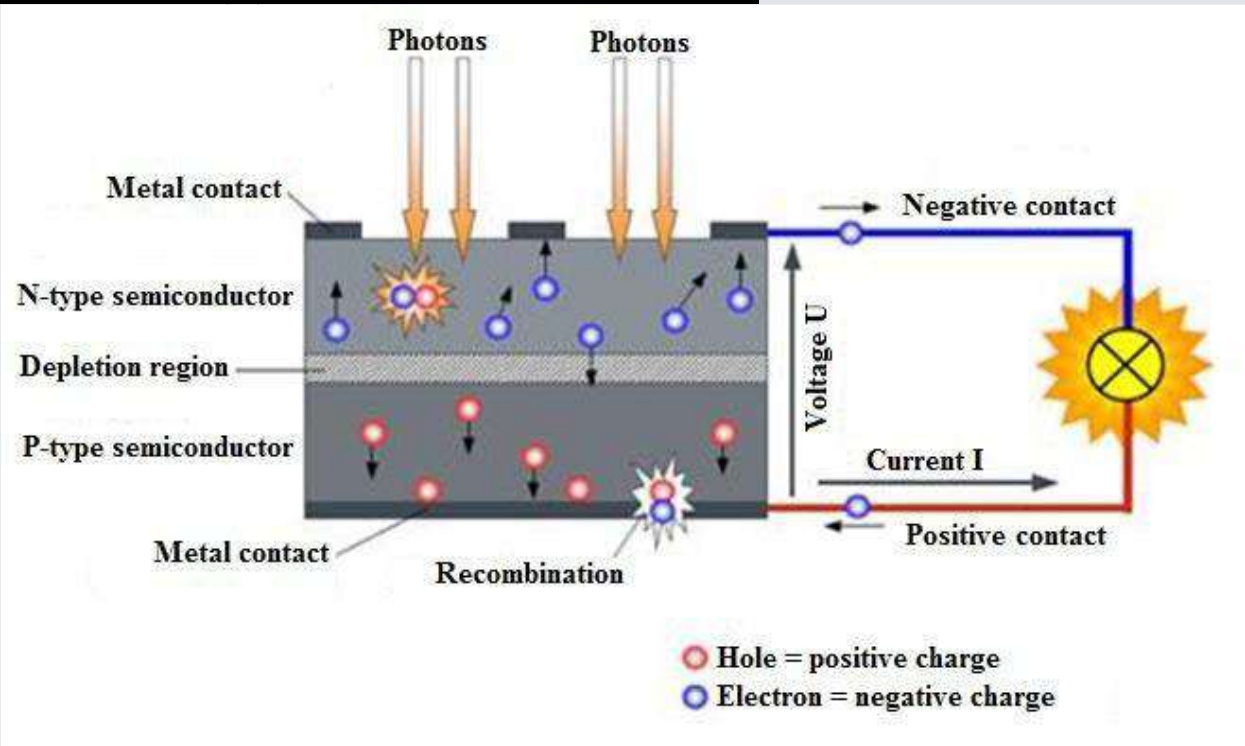
The demand for electrical power is increasing day by day throughout the world. In such a situation conventional sources of power may not meet the need. The importance of renewable power sources is considered as the alternative suitable energy sources nowadays. This project deals with the simulation of the solar power system which is the main source and that has a fuel cell backup power source. Therefore, no charge storage device is interfaced. The proposed method has four major parts: solar cell as the main supply, fuel cell as a backup source, the control device for filling the residue power from the main source to backup source and vice versa and the final part is a load. The load is energized by the solar energy directly through the boost converter. When the solar power is insufficient concerning the demand, then the load gets power from the fuel cell through the control device. However, if the solar power becomes sufficient to provide power to the load, the control device changes over the source from fuel to solar cell. The outcome of the simulation shows that the load always gets an uninterrupted power supply. Here the BLDC motor will be fed by hybrid power system, the duty cycle of boost convertor is controlled by using MPPT (P&O) algorithm, and the duty cycle of buck-boost converter is controlled by PI controller, which indirectly controlled by control block. The complete simulation has been accomplished using MATLAB Simulink environment.

PROPOSED BLOCK DIAGRAM:

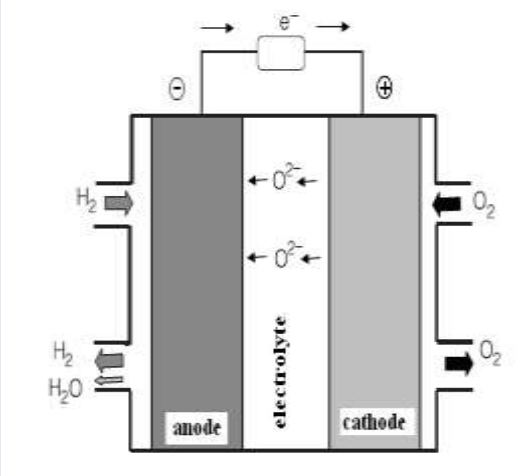


MATLAB Simulink model of solar cell-based hybrid Power System

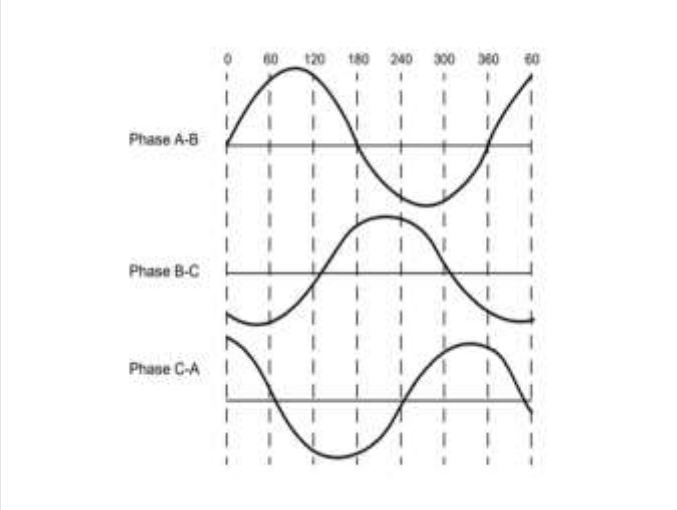
MODULE(S) OF THE PROTOYPE:



Working of Photodiode



Fuel Cell



Wave forms of Back EMF

CONCLUSION OF PROJECT:

A Renewable hybrid power system has been built and the model has been verified by analyzing the voltage and current levels of the sources at the load. In the case of hybrid power, the references should be capable of delivering power to a load continuously. In this model the continuity of supply to the load was maintained through one of the sources was changing its stator else combined.

2 IOT BASED POWER FACTOR MONITORING AND CONTROLLING SYSTEM

M.V.V.D.G.SIVA NAGU, S.DURGA PRASANNA, Y.SANDEEP VARMA, U.T.S.B.S.MAHESWAR, Y.SHYAM

SUPERVISOR: Mr. B. SESHAGIRI, M.Tech.

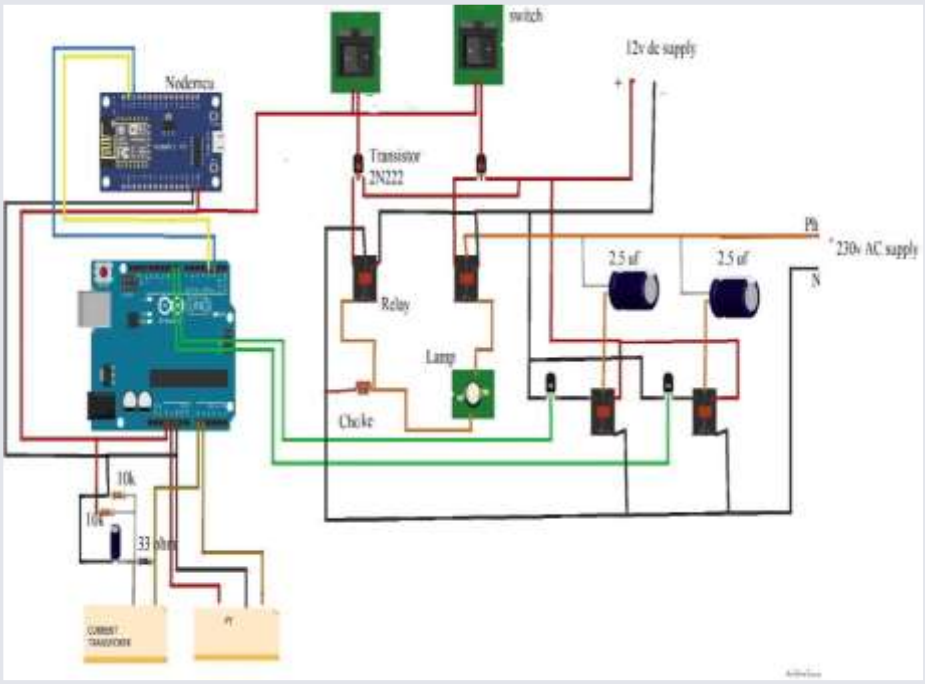
OBJECTIVE OF THE PROJECT:

The thirst for new sources of energy is unquenchable, but we seldom realize that we are wasting a part of the electrical energy everyday due to the lagging power factor in the inductive loads we use. Hence, there is an urgent need to avoid this wastage of energy.

Before getting into the details of Power Factor Correction, let us just brush our knowledge about the term ―power factor‖. In simple words, power factor basically states how far the energy provided has been utilized. The maximum value of power factor is unity. So the closer the value of power factor to unity, better is the utility of energy or lesser is the wastage. In electrical terms,

Power factor is basically defined as the ratio of active power to reactive power or it is the phase difference between voltage and current. Active power performs useful work while reactive power does no useful work but is used for developing the magnetic field required by the device. Most of the devices we use have power factor less than unity. Hence, there is a requirement to bring this power factor close to unity. Here we are presenting a prototype for automatic power factor correction using the "**8-bit AVR microcontroller Atmega328‟** as Arduino Uno.

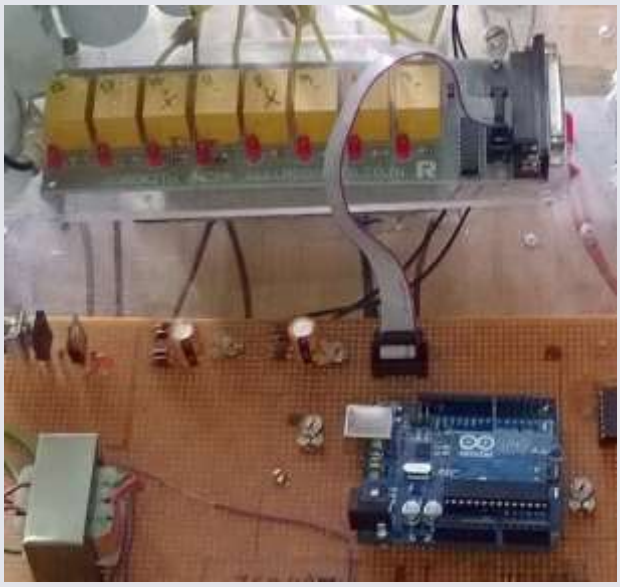
PROPOSED BLOCK DIGRAM:



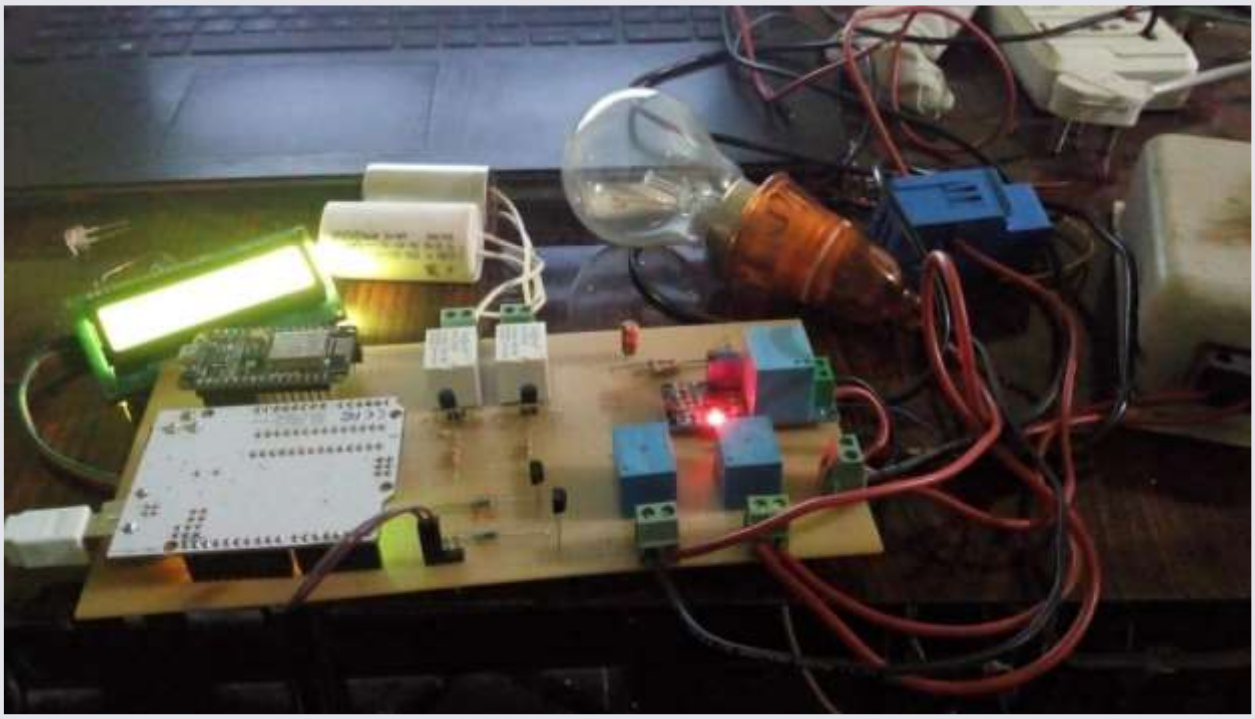
Circuit diagram

MODULE(S) OF THE PROTOTYPE:

Relay Module



Capacitor Bank



Iot Based Power Factor Monitoring and Controlling System

CONCLUSION OF THE PROJECT:

The Automatic Power Factor Detection and Correction provides an efficient technique to improve the power factor of a power system by an economical way. Static capacitors are invariably used for power factor improvement in factories or distribution line. However, this system makes use of capacitors only when power factor is low otherwise they are cut off from line. Thus, it not only improves the power factor but also increases the life time of static capacitors. The power factor of any distribution line can also be improved easily by low cost small rating capacitor. This system with static capacitor can improve the power factor of any distribution line from load side.

As, if this static capacitor will apply in the high voltage transmission line then iterating will be unexpectedly large which will be uneconomical & inefficient. So a variable speed synchronous condenser can be used in any high voltage transmission line to improve power factor & the speed of synchronous condenser can be controlled by microcontroller or any controlled device.

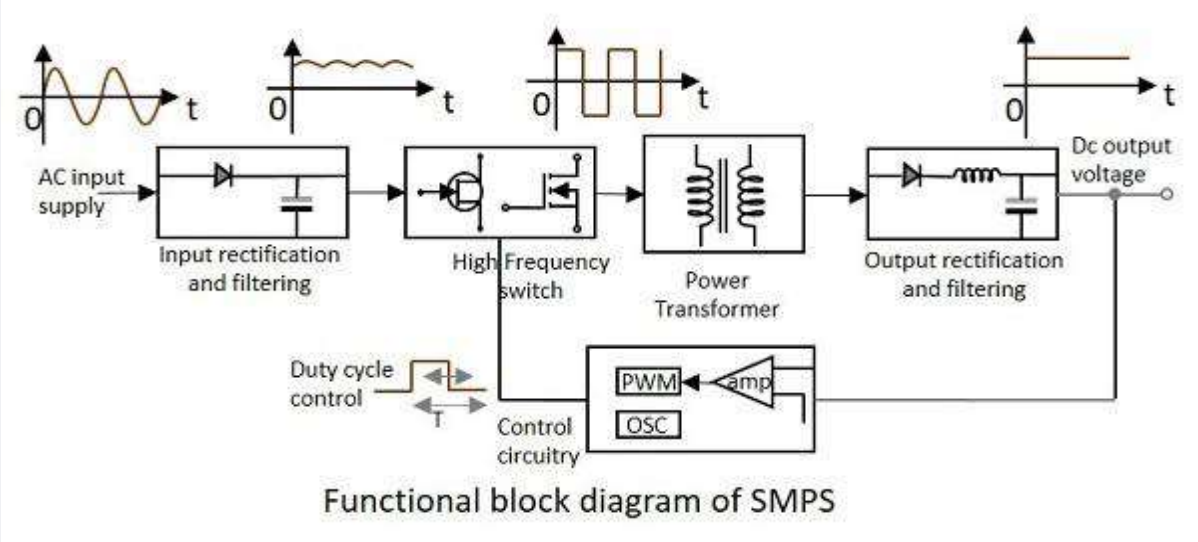
3 DESIGN AND IMPLEMENTATION OF EV CHARGING STATION BY USING PLC AND HMI

S.KOTESWARARAO , G.JAYA BALAJI , P.RAM CHARAN , V.H S R S VENKATESH
SUPERVISOR:Mr.V S N Narasimha Raju, M.Tech(PhD).

OBJECTIVE OF THE PROJECT:

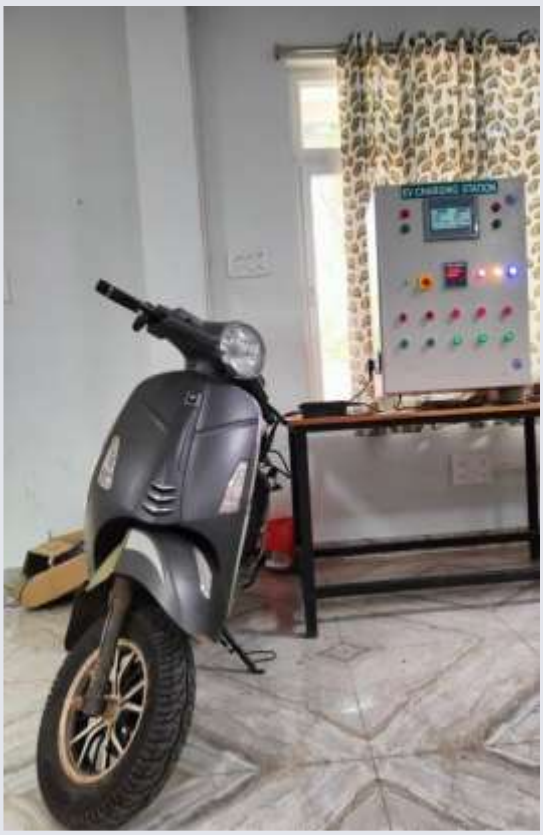
Electric vehicles have a great demand these days due to their advantages. Electric charging stations are inevitable part of electric vehicle eco system. So, we have planned to design a charging station which can be used to charge electric vehicles(bikes) according to customer requirement. It is similar to a petrol filling station where the charging requirement is to be entered through the Human Machine Interface (HMI) display. The charging status of the vehicle can be continuously monitored and compared with reference value which is generated according to amount or units entered. Once it reaches the value, which was decided according to entry, the connection between supply and electric vehicle is tripped and stops charging. In HMI display a provision has been given to enter the inputs in terms of rupees or Kwh(units) based on customers wish. This charging station is designed for two plugs and we have tested for two different electric vehicles. As this provides medium charging, we can use this station in industries, colleges for providing charging facility for faculty, employees and students.

PROPOSED BLOCK DIGRAM:



Functional block diagram of SMPS

MODULE(S) OF THE PROTOTYPE:



DESIGNED PANEL

CONCLUSION OF THE PROJECT :

In this Project, we design and implemented the Ev charging Station. With the help of this project, we can give a clear idea about the EV charging station by using PLC and HMI. We have tested this project kit with two different vehicles by entering inputs in both amount and units. Charging time is nearly about 5 hours for one vehicle. So, we can conclude it as medium charging speed. We have done by using automatic mode.

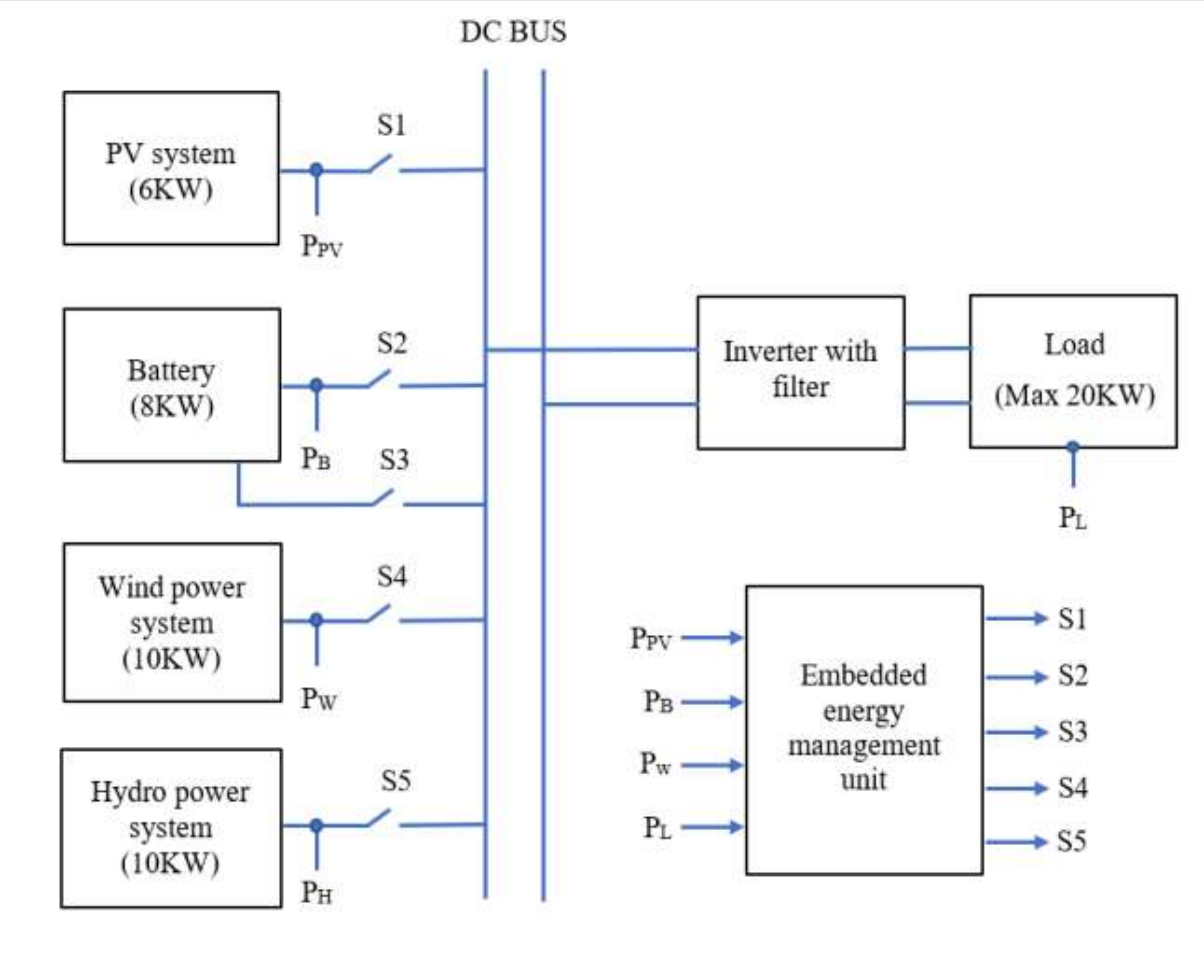
4 POWER MANAGEMENT FOR A SOLAR PVIWINDIHYDRO BASED STANDALONE MICROGRID SYSTEM

K.H.S.S.MANIKANTA, N.PAVAN KUMAR, S.LAVANYA ,V.P.N.V.V.S.CHAITHANYA
Supervisor: Dr. S. PRAGASPATHY M. E., Ph. D.

Objective of the project:

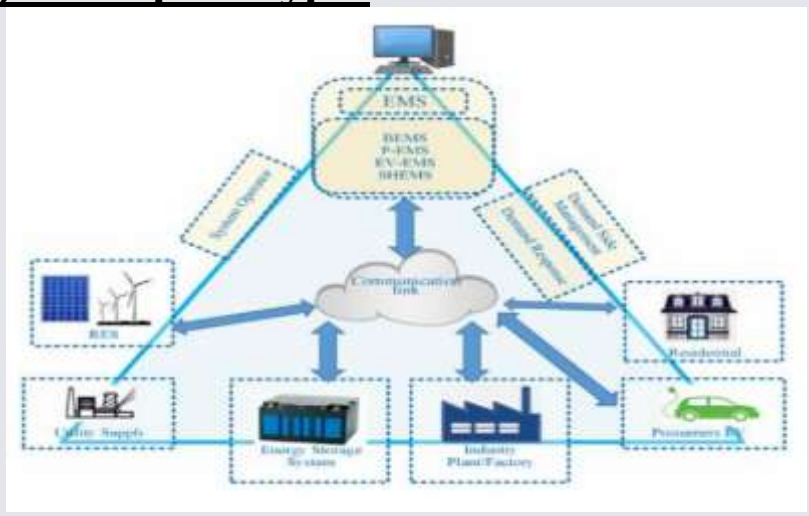
Nowadays, the usage of appliances has been increasing significantly. The fossil fuel consists of 18% gas, 30% coal, and 48% oil. It is well known that fossil fuels will eventually run out because they cannot be renewed. Besides, air pollution, global warming, and climate anomalies are negative impacts resulting from the use of fossil fuel power plants. Recently, the use of renewable energy has been regarded as an effective way of solving energy outages and environment pollution problems. However, a single type of renewable energy resource typically cannot meet the load supply requirements. Renewable sources rely on the generation from the sun and wind. Due to the intermittent and stochastic nature of wind speed and solar irradiation, renewable sources are not always available to meet the demand. In order to make use of available renewable energy sources, hybrid energy generation systems (HEGS) integrate various types of small distributed energy resources (DERs). The objective of this project is to develop a stand-alone micro grid that utilizes hybrid energy resources such as wind, PV, hydro and battery energy storage. The energy between these different resources are managed by power management system (PMS) using control unit algorithms that are used in the real-time control environment. In this proposed project, there are mainly ten scenarios were considered. Then Simulations of all scenarios are implemented using MATLAB/Simulink.

Proposed block diagram:

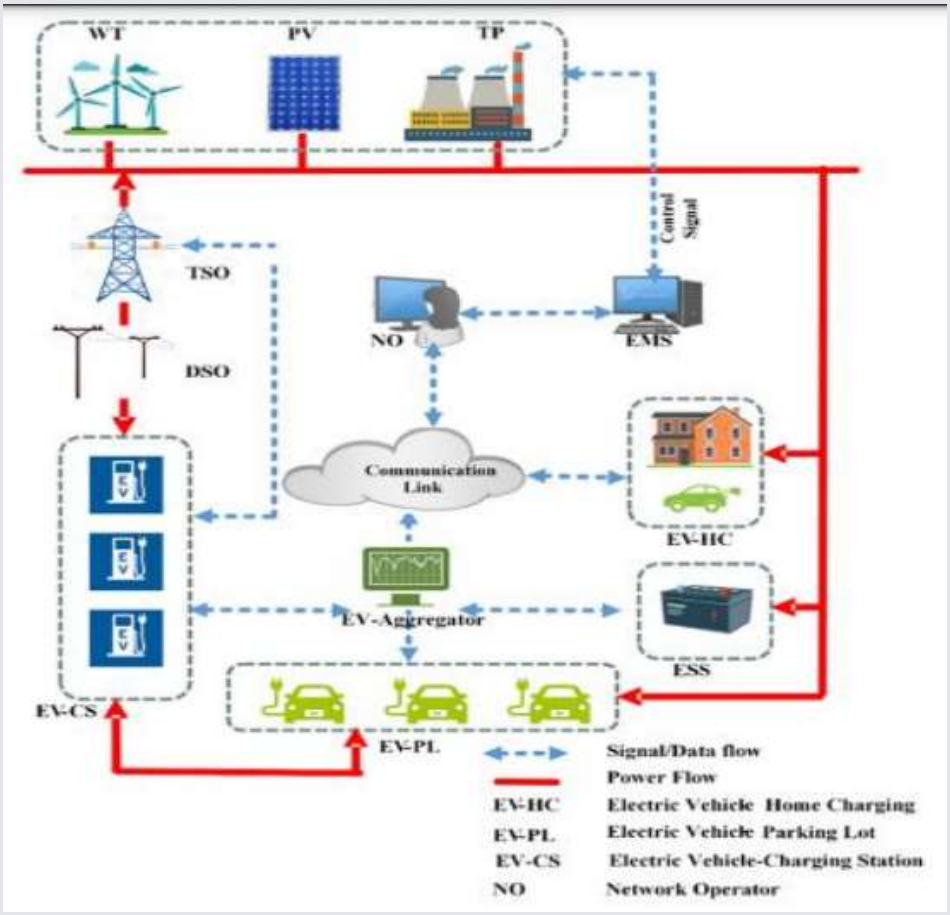


Block diagram

Module(s) of the prototype:



Stakeholders and Participants of the EMS



The typical structure of electric vehicle energy management system EV-EMS

Conclusion:

The proposed micro grid is an integration of PV system, wind power system, hydro power system along with the battery. Hourly based data of PV Power, Wind Power and Load Power is collected and this data is given to the embedded energy management unit which controls the switching operation of micro grid. In case of peak load demand, the maximum power is supplied by the hydro power system and remaining power is supplied by the PV system, wind power system and battery. This system has the capability to adjust the power sharing among the different resources depending on the availability of renewable energy and load demand. The experimental results have been validated and the output is obtained in the form of graphs.

5 SMART ELECTRICAL SWITCHING PANEL BASED ON IOT

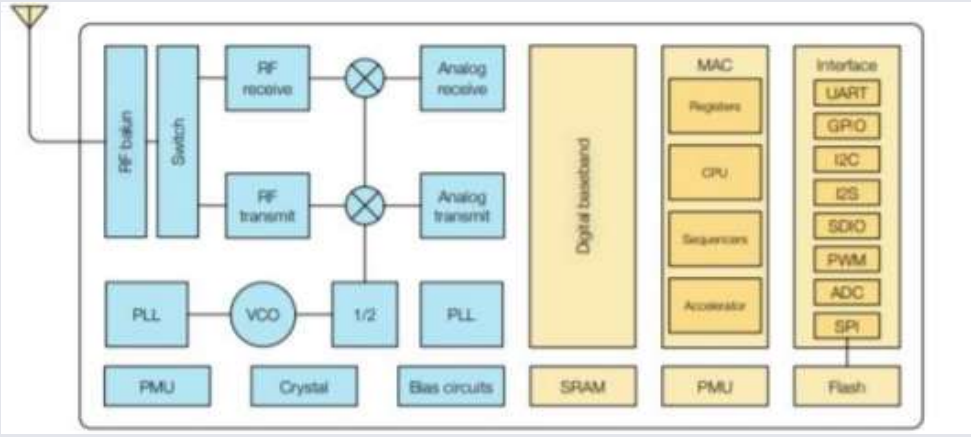
P.VASUDEVA MANIKANTA, K.SIVA VENKATA MARAJU, K.R.VENKATA SIVA SAI,M.SIVA SAI KUMAR

Supervisor: Mr. P. V. Narasimha Rao, M. Tech

Objective of the project:

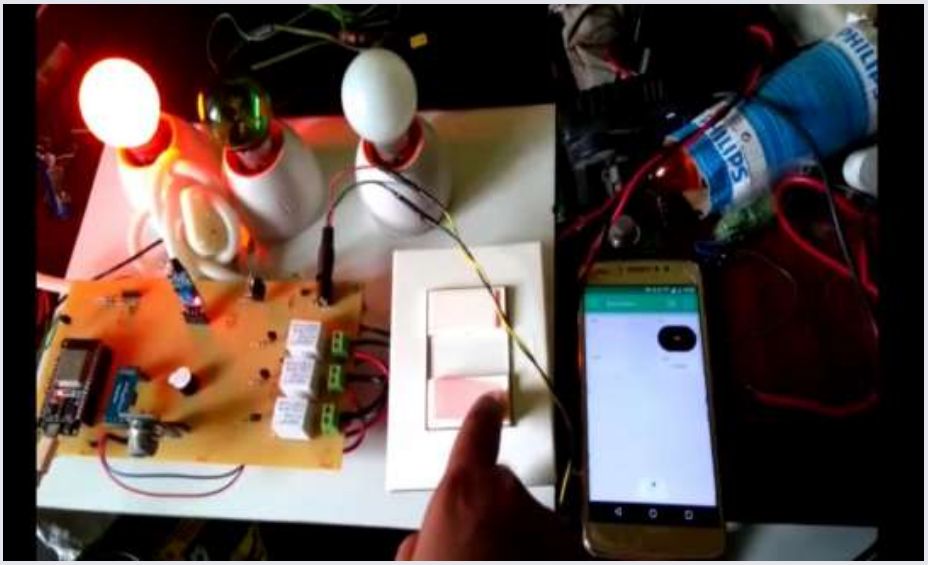
The Internet of Things (IoT) connects users with interconnection of things to facilitate the life. IoT is now shifted towards 'Thing to Thing'. Smart home concept brings comfort and convenience in our lives with the aid of IoT. Major issues in current smart home scenario are automation and security. Problem in security arises due to network of devices in the home with internet. Focus is sifted towards providing confidentiality, authenticity, and integrity of data sensed and exchanged by smart home objects. Computation overhead is also a concern for smart home solutions. Comfort and user requirements as per scenario or situation are basic need for automation. Automation with learning human behavior is also a major concern with smart home concept. Paper represents IoT based smart home automation approach which is secure and also reduces computation overhead. It can also be monitored with manual operation due to that it can be work real time operation.

Proposed block diagram:



Functional block diagram

Module(s) of the prototype:



CONCLUSION:

In our planned model a high proportion of accuracy has been achieved through implementation. This method is capable of dominating the house appliances supported the user's desired mode. All the modes work with sensible accuracy that was found throughout implementation. Users solely ought to choose modes from their smart phones and our system can do the remainder of controlling the appliances. This planned project is extremely reliable. Therefore it is afore said that this system has higher accuracy with nice potency. This system has immense opportunities to upgrade within the future. As mentioned earlier this is often the primary generation of home automation.