Automatic Power Supply Control From Four Different Sources

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Abstract ***Energy management systems must consider both the power output of renewable energy sources (RES) and the storage capacity of energy storage systems (ESS) in order for micro grids to operate in concert. This research develops a coordinated islanded ac micro grid architecture with smooth switching droop control (SSDC). Flexible power control of each ESS/RES unit can be provided with seamless modes changes based on the suggested SSDC technique. Furthermore, frequency bus-signaling can be used to implement decentralized power management. Small-signal analysis is done for SSDC, and the power management theory based on various operational modes is discussed in detail. To support the suggested coordinated control technique, real-time hardware-in-the-loop results of an islanded micro grid are shown under several circumstances. IoT is used to track the steady supply of power and alert to fluctuations.***

Keywords — Renewable Energy Sources, Energy Storage Systems (ESS), Smooth Switching Droop Control (SSDC),Decentralized power management, Micro grid, IoT.

I. INTRODUCTION

Important requirement of electric power distribution system is the need for automatic operation. In particular the transfer of one, source to another during certain system events is important to achieving the reliability goals for such systems and the facility serves. In the existing system, they had made different switches to demonstrate the failure of that power supply. By pressing any of the switch, absence of that particular source can be found out. The switches are connected to microcontroller as input supply. In this system micro controller is used. The relay driver collects output and send it to microcontroller, which adjusts relay to maintain continuous supply to the load in the project. In this proposed system, we made use of arduino uno, which helps in operating the system from the different points. This technology is made by us, which is used to collect the information about the different sources either the switch is ON or OFF. In this system, we made use of Arduino uno so that all the system working properly. If we see it at commercial level, then we can estimate that there are so many consumers or customers which have the equipment or machines whose requirements is only uninterruptable power supply [1] [4]. Such as the data base companies whose all work is done on computer then it is required an uninterruptable power supply all the time, otherwise their computer could be off during the time when the load is shifted on another source, similarly the companies which have the data base production machines then it also could be also off during the load shifted then their production can be stop or damage. Concentrating on these above problems we can examine the importance of this auto power supply control system in this modern world . Different peoples and companies are working on these auto power supply control systems which are making this system with the help of magnetic contactors and power relays .

II. RELATED WORK

In this section we discuss the existing The Multi-Node Case For Rechargeable Sensor Networks With Wireless Energy Transfer Liguangxie Yao Yi Thomas Wenjing Hou Hanif Louvirginia Polytechnic Institute And State University, D. Sherali Scott F. possible approach to refuel sensor nodes in a wireless sensor network (WSN) is wireless energy transfer based on magnetic resonant coupling. One sensor node at a time charging, however, presents a significant scaling issue. Multiple nodes can be charged simultaneously, according to recent developments in magnetic resonant coupling. We use this multi-node wireless energy transfer technology in this research to overcome the energy problem in a WSN. We take into account a wireless charging vehicle (WCV) that

Abdelkader Boulezhar are the authors. They are from the regularly travels inside a WSN and wirelessly charges sensor nodes. To divide the two-dimensional plane into neighboring hexagonal cells, we suggest a cellular structure. The WCV stops by these cells and charges the sensor nodes there. A formal optimization framework is what we aim for. A Hybrid Renewable Energy System For A Rural School In Tagzirt, Morocco Is Being Studied. Mouna Lamnadi, Mourad Trihi, and

Faculty of Sciencesat the University Hassan 11 in Ain-Cock in Casablanca, Morocco. Global energy demand is constantly rising, and this combined with the depletion of natural resources like fossil fuels createsa massive energy challenge for civilization. The production and use of energy at low cost prices must be rethought by both industry and consumers. To address this issue sustainably and lower the proportion of carbon dioxide (CO2) emission to the environment, which lowers global warming, renewable energy (RE) applications and energy savings are essential. This study presents a method for methodically developing a hybrid renewable energy system (HRES) for a rural school located in Tagzirt, Morocco. The HRES includes battery storage, solar, wind, and diesel generators as backup resources. It also includes solar, wind, and diesel generators as backup resources. The environment, energy, and water are crucial inputs for the sustainable growth of society. Small hybrid power systems based on renewable energy for desalination applications in remote locations Nuclear Desalination Demonstration Project, Bhabha Atomic Research Centre, Kalpakkam, India,author : R. Nagaraj It is a typical occurrence for some regions of the nation to experience both water and electricity stress at the same time. Utilizing renewable energy sources, suchas solar energy, wind energy, or micro hydropower to deliver a reliable power supply to remote areas has a lot of potential. To raise the standard of living of those without access to the electricity grid, it is possible to harness the abundant energy present in nature and convert it to electricity in a sustainable manner. The benefits of adopting renewable energy sources for power generation in remote places are evident, such as the frequently prohibitive cost of transporting fuel for combustion

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Ⅲ. SYSTEM ANALYSIS

A. General Architecture

RTC (real time clock) is used for scheduling power to a distribution network. Current sensor is used to calculate the current. IoT is used to monitor the power supply frequently and intimates the distribution center through a mobile application. Four types of sources are connected to make a uninterrupted power supply.

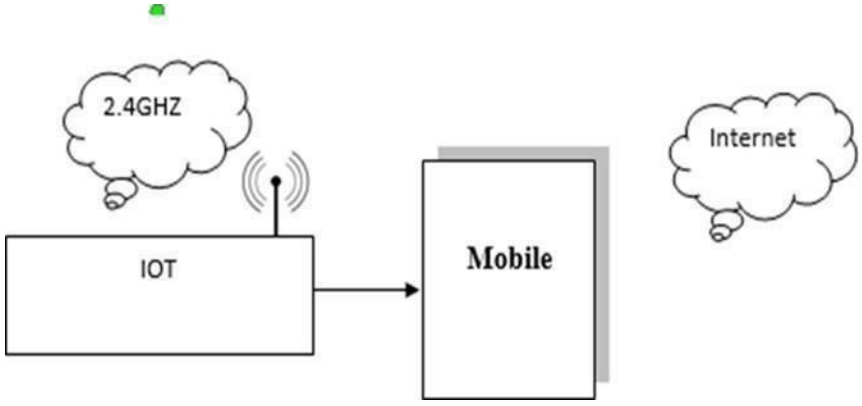

Figure 1 General Architecture

B.Existing System

To deliver the power in critical time is one of the challenging techniques. Conventional sources are used for power generation.

B. Proposed System

RTC (real time clock) is used for scheduling power to a distribution network, Current sensor is used to calculate the current, IoT is used to monitor the power supply frequently and intimates the distribution center through a mobile application. Four types of sources are connected to make a uninterrupted power supply.

IV. SYSTEM DESIGN

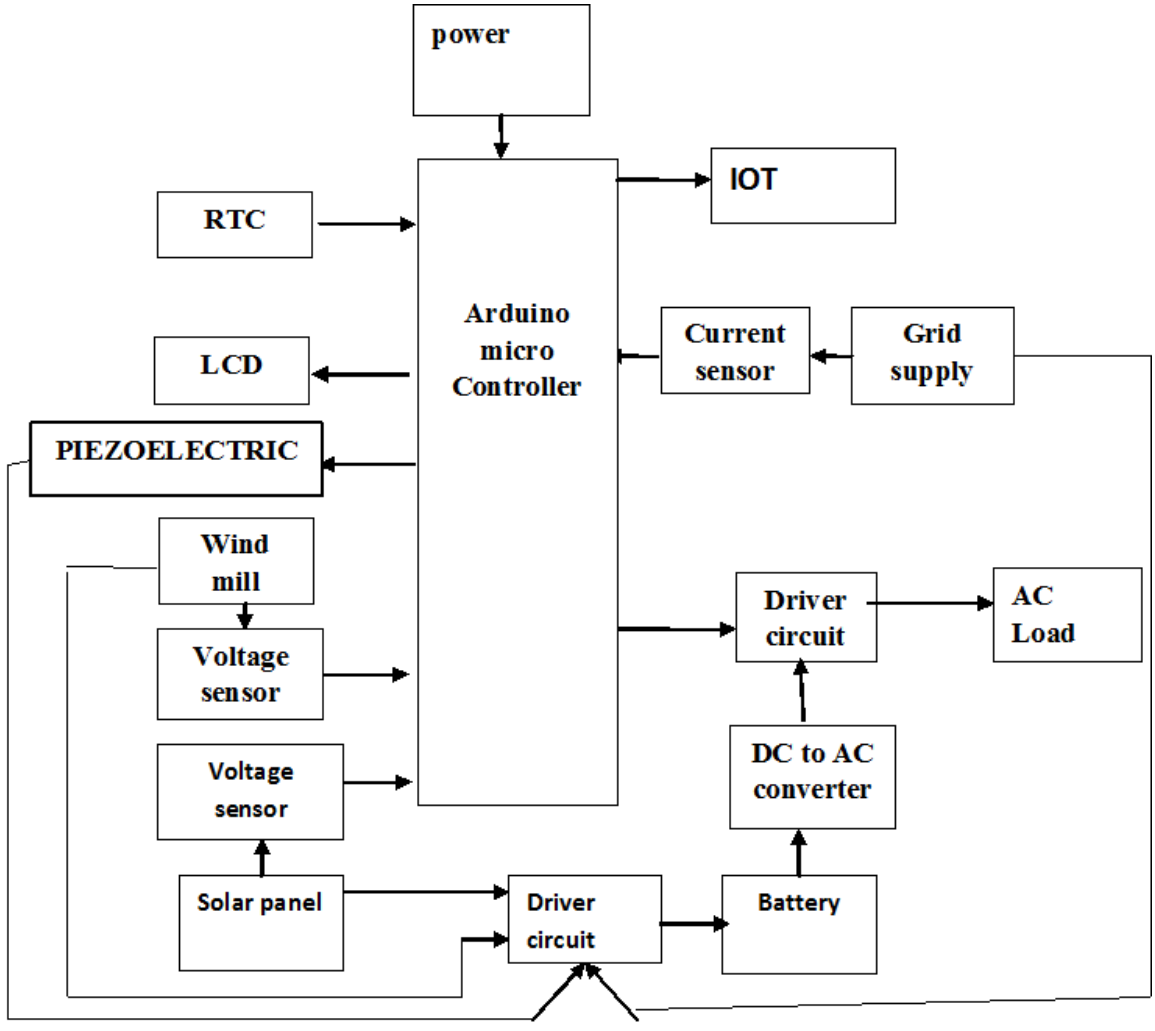

Figure 2.Activity Diagram

V. METHODOLOGY

Arduino, RTC, current sensor, solar panel, wind turbine, piezoelectric sensor battery, LCD, and buzzer are required to realize our suggested system. Typically, the grid provides electricity to the load. Real time clocks, or RTCs, contain information like time, date and calendars. In the controller, the peak time is fixed. Data from RTC is read by the controller. Automatically distribute the renewable battery power whenever peak times exist. Renewable energy is converted to ac power using a DC to AC converter. The computed quantity of grid and renewable energy usage is transmitted to the EB section using IOT. The line voltage is measured using a voltage sensor.

Here, a current sensor is utilized to safeguard the equipment from problems such as

1. Over voltages
2. Under voltages.

WORKING PRINCIPLE

To attain our proposed system need to use Arduino, RTC, current sensor, solar , wind mill, piezo electric sensor, battery, LCD, buzzer. Normally load takes power supply from grid. RTC is nothing but real time clock it has information like time and date and calendar. We fix the peak time in controller. Controller reads the data from RTC. Whenever peak time persist automatically share the renewable battery power. DC to AC converter is used to convert renewable energy to ac energy. IOT is used to send the calculated amount of grid and renewable energy use to the EB section. Voltage sensor is used to measure the line voltage.
Here current sensor is used for protect the devices from faults like 1.over voltages 2.under voltage. If any one of the above problem happens the device is automatically share or switch off the device. Controller status and everything is displayed in LCD. The whole process is controlled by microcontroller.

FUTURE SCOPE:

The project can be further enhanced by using other sources like wind power also and then taking into consideration for using the best possible power whose tariff remains lowest at that moment.

ADVANTAGES:

- Uninterruptible power supply
- Easy to Monitor
- Manual Power Is Less
- Implement in Large Amount
- High Efficiency
- Eco-friendly

DISADVANTAGES:

- Initial Cost is high.
- Energy through Piezo is Comparatively Low.

APPLICATIONS:

- High power Demand Areas
- Rural Villages
- Factories

CONCLUSION

This project model can be implemented in rural and urban areas where the power cut-off is regular. With some modification in wind part and increasing the no. solar panel and piezo Wattage this model can be utilized as stand-alone system especially in offshore onshore where the speed of wind is adequate. By using a controller. Power Converting Unit (PCU) this model can be utilized as a Grid-tie and renewable energy power system

REFERENCES

1. P Prasad, B Bhargava Reddy and A V Sudhakara Reddy "Power Loss Minimization in Distribution System using Network Reconfiguration with Particle Swarm Optimization", International Journal of Engineering Science & Advanced Technology (IJESAT), Vol.5, Iss.3, pp.171-178, May 2015.
2. K.Surekha and A.V.Sudhakara Reddy "A New Control Topology for Smart Power Grids using Bi-directional Synchronous VSC", International Journal of Informative & Futuristic Research, Vol.2, No.10, PP.3695-3704, June 2015.
3. A. V. Sudhakara Reddy, Prof. M. Damodar Reddy, "Optimization of Distribution Network Reconfiguration Using Dragonfly Algorithm", Journal of Electrical Engineering, Vol.16, No.4, No.30, pp.273-282, 2017.
4. A. V. Sudhakara Reddy, Dr. M. Damodar Reddy, "Network Reconfiguration of Distribution System for maximum loss reduction using Sine Cosine Algorithm", International Journal of Engineering Research and Applications (IJERA),Vol.7, No.10, pp.34-39, October 2017.
5. A.V. Sudhakara Reddy, M. Damodar Reddy and Y. V. Krishna Reddy "Feeder Reconfiguration of Distribution Systems for Loss Reduction and Emissions Reduction using MVO Algorithm", Majlesi Journal of Electrical Engineering,Vol.12, No. 2, pp.1-8, June 2018.
6. Y V Krishna Reddy, M. Damodar Reddy and A. V. Sudhakara Reddy "Flower Pollination Algorithm for Solving Economic Dispatch with Prohibited Operating Zones and Ramp Rate Limit Constraints", Journal of Emerging Technologies and Innovative Research (JETIR), Vol.5, Iss.10, pp.498-505, 2018.
7. S. Sudhakara Reddy, N. Rajeswaranand V. K. V. Kesava, "Strategic Planning to Promote Engineering Projects in Community Service(EPICS) in Engineering Institutions," 2018 World Engineering Education Forum - Global Engineering Deans Council (WEEF-GEDC), Albuquerque, NM, USA, 2018, pp. 1-4
8. S.Bharathi, A.V.Sudhakara Reddy, Dr.M.Damodar Reddy, "Optimal Placement of UPFC and SVC using Moth-Flame Optimization Algorithm", International Journal of Soft Computing and Artificial Intelligence, ISSN: 2321-4046, Vol.5, No.1, pp.41-45, May2017.
9. Kalyani S, A. V. Sudhakara Reddy and N. Vara Prasad "Optimal Placement of Capacitors in Distribution Systems for Emission Reduction Using Ant Lion Optimization Algorithm", International Journal of Current Advanced Research, Vol.7, No.11, pp.16339-16343, 2019

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