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A Multi Energy Source UPS System using IOT

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***Abstract:** This paper presents the Multi energy source UPS system using IOT. This concept is very useful for the customers who want to achieve UPS (uninterruptible power supply) from various sources like solar, generator, main, and Battery Powered. This System will work Automatically or the user can Switch (manually) the Sources through wireless IOT platform.*
***Keywords:** UPS, Solar, IOT, Battery, Generator.*

I. INTRODUCTION

This paper demonstrates the concept of UPS system by using Multiple sources and involving the concept of IoT.
In recent years, cities have been turning to advanced technologies to become Smart Cities. This term is used to describe Information and Communication Technological (ICT) solutions for cities and to highlight ICT importance and potential in helping the city to develop competitive advantages. More specifically, Smart Cities are cities that work in frugal and sound ways, by incorporating every one of its substructure and administrations into a unified whole and utilising insightful gadgets for observing and control, in order to guarantee maintainability and effectiveness. Energy demand is one of the most crucial and multifaceted problems for Smart Cities. As the quality of life is being improved, as well as the continuous increase of the population, it is obvious that the increase in energy demand is an irreversible situation.
This continuous increase in energy demand coupled with limited conventional energy reserves are the main factors contributing to the increase in energy problems.
The introduction of IoT in energy and the methods using “intelligent” energy management and Internet technologies constitute an important factor in promoting efficient energy.

II. LITERATURE SURVEY

India still faces an unprecedented energy crisis in rural and suburban areas. The problems become more severe during summers. However, winter is no different as there was still an average power outage of 3-4 hours every day. Those without generators and UPS faced tremendous problems in these outages. The prices of both continued to increase due to a sharp increase in their demand. We are not using solar UPS as their replacement but it can be used as backup energy during grid failure. It also does no harm to the environment. The sun shines bright throughout the year. Global Solar Radiation estimates have been made for most parts of the world, and also for major cities of India which is essential for the optimum design of solar energy conversion systems and utilizing them with UPS applications.

III. BLOCK DIAGRAM

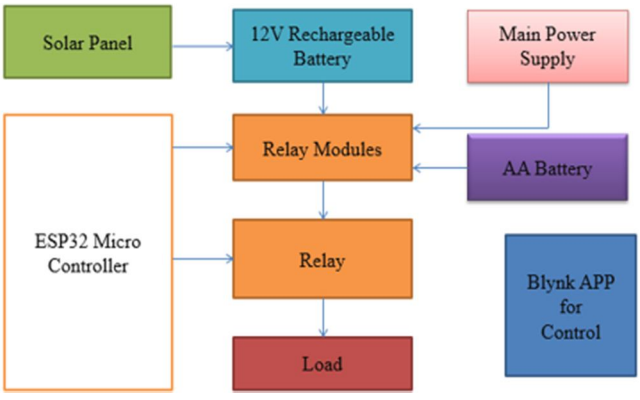


Fig 1: Block Diagram

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IV. HARDWARE REQUIREMENTS

A. ESP32

The ESP32 is an advanced Microcontroller. ESP32 is abbreviated as Espressif and 32 says it is a 32 bit Microcontroller. ESP32 has inbuilt WI-FI and Bluetooth modules. The ESP32 is an updated version of the ESP8266. Frequency management of ESP32 is upto 240Mhz. ESP32 has 4mb of flash memory and 512kb of R0M, and the operating voltage of it is 3.3v to 5v dc.The ESP32 can be programmed using many different development environments. Code can be written in C++ (like the Arduino) or in MicroPython.

B. Power Supply Circuit

Power supply circuit is the network where 230v AC is converted to 12v DC. The circuit consists of Transformer, Diode bridge, Capacitive filters and Voltage regulator. This Power supply circuit is used as one of the sources in our Multi energy concept.

C. solar panel

Solar panels are machines used to absorb solar radiation and convert it into electricity or heat. It is used to power the battery. A solar panel is a collection of solar cells (or photovoltaic), which can be used to generate electricity with the effect of photovoltaic. Here we are using Solar as one of the sources in our Multi energy concept.

D. Battery

Lithium batteries that generate electrical energy by converting chemical energy via redox reaction on the active materials, i.e., the negative (anode) and positive electrode (cathode), in one or more electrically connected electrochemical cells. Here we use the 12v, 23A non-rechargeable lithium battery as another source.

E. Relay

Relay is an Electromechanical switch. It is used to connect or disconnect the connection between two circuits. Instead of manual operation a relay is applied with electrical signal, which in turn connects or disconnects another circuit.

F. DC Motor

A DC motor is an electric motor that runs on direct current (DC) electricity. In any electric motor, operation is based on simple electromagnetism. Here we use a 12v DC motor as Load.

V. SOFTWARE REQUIREMENTS

A. Arduino IDE

Arduino IDE is a cross-sectional application written in Java and is based on the IDE language of the programming language and Wiring project. It is designed to introduce programs to artists and other young people who are unfamiliar with software development.

It is possible to integrate and upload programs to the board with a single click. There is usually no need to plan to create files or run applications on the command line interface.

Arduino IDE comes with a C / C ++ library called "Wiring", which makes many standard installation/removal tasks much easier. Arduino programs are listed in C / C ++.

B. Blynk

Blynk is a Server and APP Service providing Platform. It was designed for IOT. It provides High Security Service and Server for IOT applications.

This is easy to use and supports all advanced Micro controllers. Blynk server is responsible for all the communication between Smartphone and Hardware . Through the BLYNK app users can manually control the supplying source in our Multi energy concept.

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VI. FLOW CHART AND WORKING PHOTO

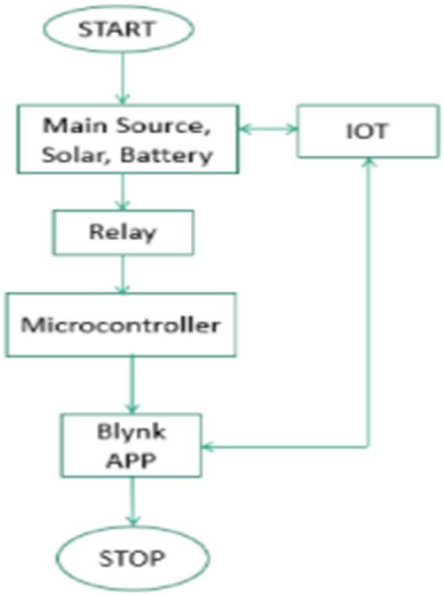


Fig 2: Flowchart

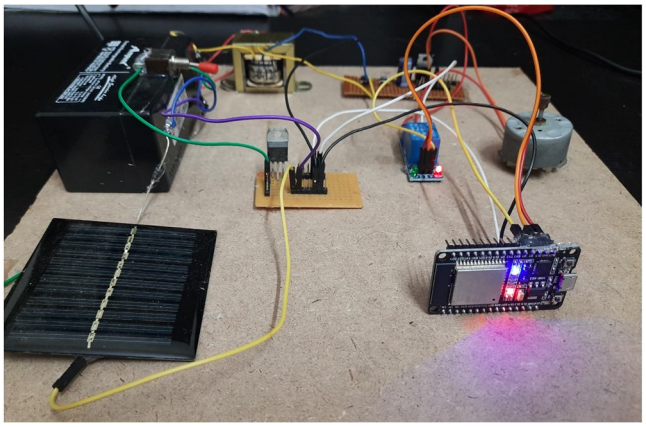


Fig 3: Project Kit

VII. WORKING

A Multi Energy source UPS using IOT gives Efficient power to the load. Here the multiple sources are Solar, Supply from Main source, and an external Battery. These three sources are connected to a Microcontroller i.e, ESP32 through Relay. This Microcontroller is connected to an APP called BLYNK through the Internet.

Now the sources we used in our Project are linked in the Blynk app by writing code, here we have written code in C++ and now we have a connection between our Hardware and the BLYNK App which is installed in the user's phone.

A. Steps to Control

1) Switch ON the supply to the Load.
2) Turn ON the Internet source to the Microcontroller.
3) Open the BLYNK app.
4) Press the start button in the BLYNK app.
5) Any one of the sources will automatically connect to the load.
6) By tapping on the Source user can change the source.

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VIII. CONCLUSION AND FUTURE WORK

From this Project the concept of Uninterrupted Power supply is obtained using Multiple energy resources, which are connected to an IOT platform called BLYNK. Here the sources are connected and disconnected to the load manually by the user according to the recruitment. This project can work automatically when code is written.

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BIOGRAPHIES



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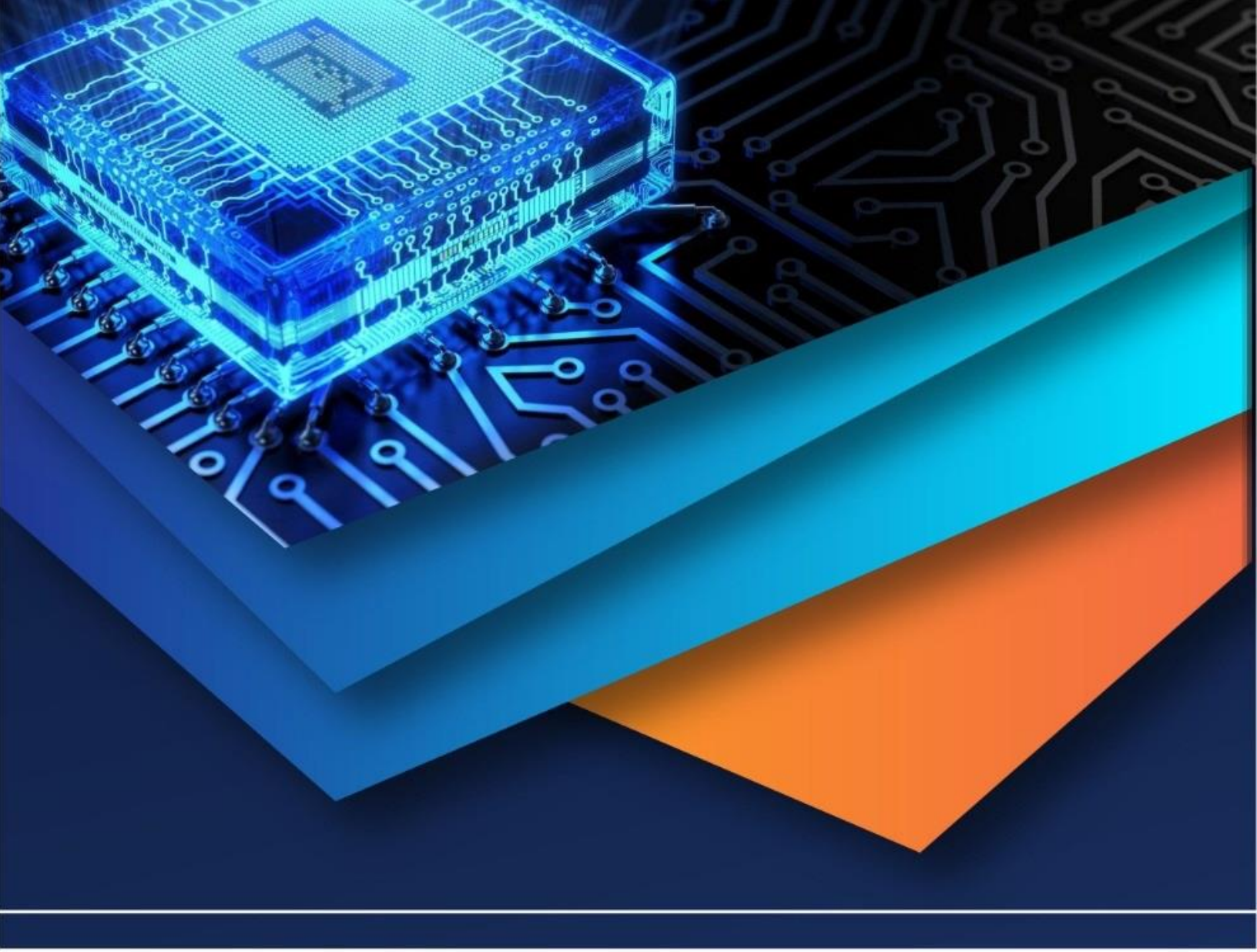
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