WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Uninterrupted power supply from different sources

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ABSTRACT :

The abstract discusses how uninterrupted power supply (UPS) is essential for maintaining electricity during outages. Different UPS sources like batteries, generators, and renewable energy systems are explored.

Batteries store energy and provide quick backup power during short outages. Generators use fuel like diesel or natural gas to produce continuous electricity for longer periods. Renewable energy systems, such as solar panels, harness energy from the sun to generate power.

Having multiple UPS sources ensures reliable electricity, especially in critical places like hospitals and data centers. By using batteries, generators, and renewable energy systems together, businesses and communities can keep essential services running smoothly during power disruptions. This diverse approach to UPS helps minimize the impact of outages and promotes sustainability by reducing reliance on traditional power sources.

INTRODUCTION :

Uninterrupted power supply (UPS) is like a superhero that saves the day when the electricity goes out. It ensures that our lights stay on and our devices keep running, even during power outages. UPS systems use different sources to provide backup power when needed.
One source of backup power is batteries. These big rechargeable batteries store electricity and kick in right away when the main power goes out, keeping things running smoothly for a short time.Generators are another source of backup power. They're like mini power plants that use fuels like diesel or natural gas to produce electricity. Generators can keep the lights on for a longer time during outages.
And then there are renewable energy sources like solar panels. These panels soak up the sun's energy and turn it into electricity. This clean energy can be stored in batteries to provide power even when the sun isn't shining.By using different sources for backup power, UPS systems ensure that we always have electricity when we need it, keeping our lives running smoothly even when the regular power supply fails.

METHODOLOGY:

The methodology of uninterrupted power supply (UPS) from different sources involves a few simple steps to ensure continuous electricity, even during outages.
Firstly, the UPS system is set up with various sources of backup power, such as batteries, generators, and renewable energy systems like solar panels. These sources are connected to the main electrical system of a building or facility.
When the regular power supply fails, the UPS system automatically detects the outage and switches to the backup power source. For example, if batteries are part of the UPS system, they kick in immediately to provide electricity to keep essential devices running.If the outage continues for a longer duration, generators or renewable energy systems like solar panels can take over. Generators start producing electricity using fuels like diesel or natural gas, while solar panels harness energy from the sun to generate power.
Throughout the outage, the UPS system continuously monitors the power supply and switches between different sources as needed to ensure uninterrupted electricity. Once the regular power supply is restored, the UPS system switches back to it seamlessly.By employing this methodology, UPS systems ensure reliable electricity supply, keeping essential services and devices operational even during unexpected power disruptions.

LETRATURE REVIEW :

This literature survey would provide a thorough understanding of existing research, technologies, challenges, and future directions related to auto power supply control systems from solar, mains, generator, and inverter sources.
A literature survey on auto power supply control systems involves reviewing existing research, academic papers, patents, and other relevant sources to gain insights into the advancements, challenges, and trends in this field. Here's a structured approach to conducting a literature survey on auto power supply control systems:

1. Define Scope and Objectives:

Clearly define the scope of your literature survey. Identify the specific aspects of auto power supply control systems you want to explore, such as technologies, applications, control algorithms, hardware implementations, or performance evaluation metrics.

2. Search Strategy:

Utilize academic databases (like IEEE Xplore, ScienceDirect, Google Scholar), patent databases, conference proceedings, and relevant journals. Develop search queries using keywords such as "auto power supply control," "automatic voltage regulation," "smart grid," "power management," "energy-efficient systems," etc.

3. Review Relevant Papers and Publications:

Identify seminal works, recent research articles, and relevant review papers in the field. Look for both theoretical studies and practical implementations. Pay attention to papers that discuss novel algorithms, methodologies, or experimental results

4. Organize and Summarize Findings:

Categorize the literature based on themes or topics, such as control strategies, power electronics, renewable energy integration, microgrid systems, etc. Summarize key findings, methodologies, experimental setups, and outcomes of each study.

5. Identify Trends and Gaps:

Analyze the common trends, emerging technologies, and research directions in auto power supply control systems. Highlight any gaps or areas requiring further investigation. Consider aspects such as efficiency improvements, reliability, scalability, cost-effectiveness, and integration with renewable energy sources.

6. Compare and Evaluate Approaches:

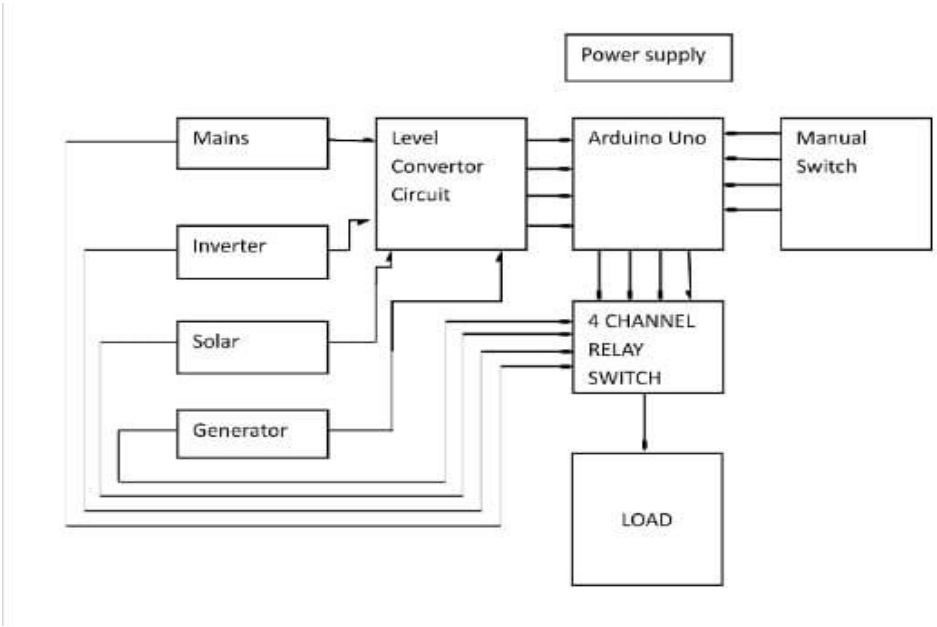
Compare different approaches, algorithms, or control strategies presented in the literature. Evaluate their strengths, weaknesses, and applicability to various scenarios or applications. Consider factors like system complexity, computational requirements, response time, and robustness.

7. Consider Case Studies and Practical Implementations:

Look for case studies, field trials, or real-world implementations of auto power supply control systems. Assess their performance, challenges encountered, and lessons learned. Case studies provide valuable insights into the practical feasibility and effectiveness of proposed solutions.

PROPOSED METHODOLOGY AND OPERATING PRINCIPLE :

BLOCK DIAGRAM

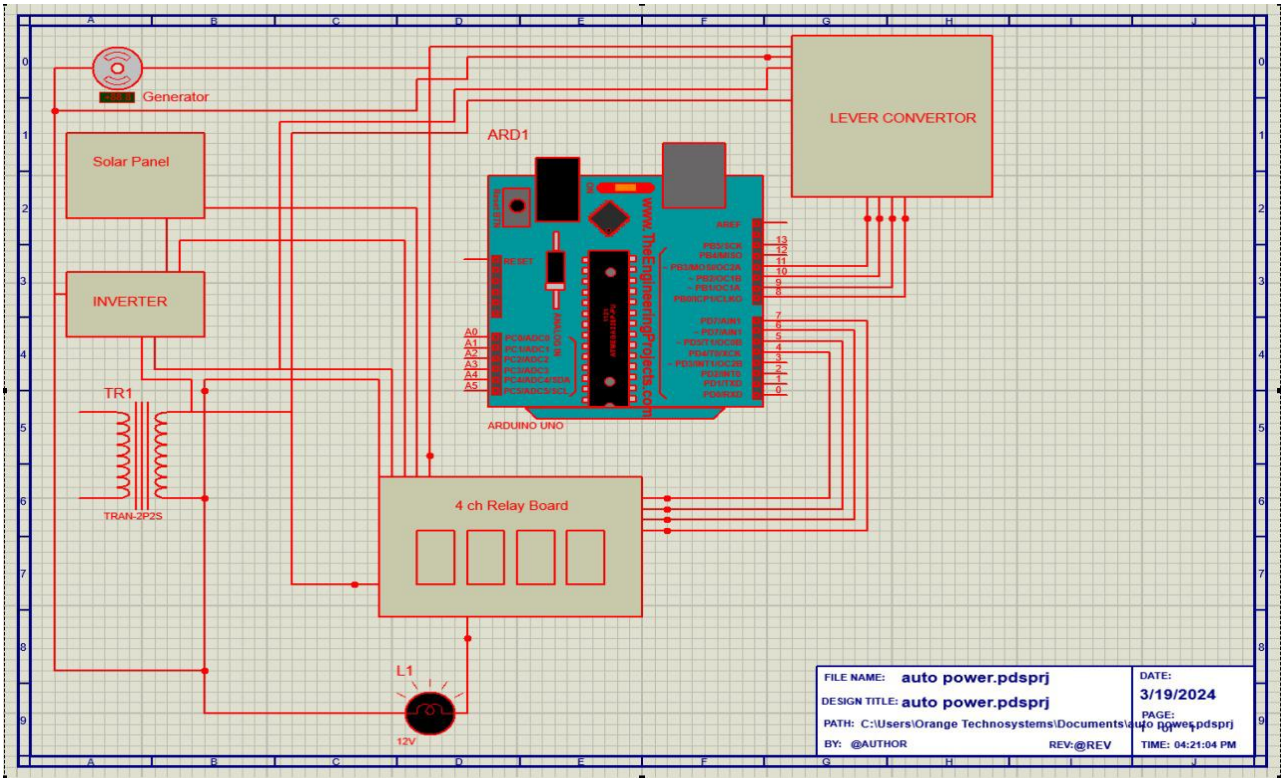


WORKING PRINCIPLE :

This project uses an arrangement of four different sources of supply which are channelized to a load so as to have an uninterrupted operation of the load. We have taken first source with solar supply and assumed as if being fed from four different sources by connecting all the four incoming sources in parallel. The ac source to the lamp is connected to four relays by making the entire normally open contacts parallel and all the common contacts in parallel. Four push button switches are used which represent failure of corresponding supply respectively and are interfaced to the controller. Initially we have given high input signal to the microcontroller, so as a result the controller generates a low output to activate the first relay driver which will result in the relay being energized and the lamp glows.

While the push button for solar is pressed that represents failure of solar supply as a result the supply is provided from the next source and the microcontroller receive high input and generates low output to activate the second relay driver which will result in the second relay being energized and the lamp glows. When we press the inverter button, it indicates the inverter or fails to operate and the supply comes from the next source and the next source will supply high input to the controller and which will provide low signal to the third relay and the lamp switches ON and when we press the third push button the supply will chose next source now the fourth source will provide input to the microcontroller and controller activates the fourth relay and the load will get the supply and the lamp continues to glow. When all the relays are off leaving no supply to the lamp, the lamp is switched off. One 16 x 2 lines LCD is used to display the condition of the supply sources and the load on real time basis.

CIRCUIT DIAGRAM:



RESULT AND DISCUSSION :

Initially, our project has been a very big challenge especially considering that there Has been previous done already in the past but with a lot of budget in the bank. However, we Challenged ourselves to do the same but with the least amount of budget being spent on our System because we are aiming for the majority who do not have financial means to afford such Big systems which can generate water from atmosphere. But, all things considered, we as a Group did what was unachievable in the time frame of these three months.

CONCLUSION:

In the “Power offer from four totally different sources: star, Inverter, Main and Generator” has been explained during this project with all its features and details. The significance of this project lies in its varied blessings and wide places of applications like Industries, Hospitals, Banks; etc. It has been

developed by integrating Colleges/Schools, etc. It has been developed by desegregation options of all the hardware elements used.Presence of every module has been reasoned out and placed strictly thus conducive to the simplest operating of the unit.

FUTURE SCOPE:

The future scope of an Auto Power Supply Control System integrating solar, mains, generator, and inverter sources includes advancements in smart grid integration, energy storage, remote monitoring, predictive maintenance, and hybrid energy systems. Scalability, grid independence, and energy efficiency measures will be emphasized, ensuring uninterrupted power supply. This system will play a pivotal role in promoting energy resilience and sustainability across diverse applications.

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