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Patent Search

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Inventor

Name	Address	Country
Dr.G.Saravanan	V.S.B.Engineering College Karudayampalayam Po Karur 639111,Tamilnadu,India	India
Dr.V.S.Arulmurugan	Professor & Head Department of Electrical and Electronics Engineering Shree Venkateshwara Hi-Tech Engineering College, Gopichettipalayam Erode,638455	India
Dr.M.Murugesan	Assistant Professor Department of Electrical and Electronics Engineering,Karpagam Institute of Technology Coimbatore,641105	India
R Gopalakrishnan	Assistant Professor Department of Electrical and Electronics Engineering, Kongunadu College of Engineering India Tamil Nadu Tiruchirappalli,621215	India
VJ Vijayalakshmi	Assistant Professor Department of Electrical and Electronics Engineering ,Karpagam Academy of Higher Education,Coimbatore 641 021	India
T Ramesh	Assistant Professor Department of Electrical and Electronics Engineering , Mahendra College of Engineering Salem 636106	India
M Inba Arasi	Assistant Professor Department of Electrical and Electronics Engineering, Mahendra College of Engineering Salem 636106	India
S Suba	Assistant Professor Department of Electrical and Electronics Engineering, Mahendra Engineering College Mahendhirapuri, Mallasamudram West, Namakkal 637503	India
M Dinesh	Assistant Professor Department of Electrical and Electronics Engineering,Mahendra Engineering College Mahendhirapuri, Mallasamudram West, Namakkal 637503	India
R Aravindh	Assistant Professor Department of Electrical and Electronics Engineering, Kongu Engineering College Perundurai,Erode 638060	India
Dr.P.Venkatesan	Associate Professor Department of Electrical and Electronics Engineering, Mahendra Institute of Technology Mahendhirapuri, Mallasamudram, Namakkal DT 637 503	India

Applicant

Name	Address	Country
Dr.G.Saravanan	V.S.B.Engineering College Karudayampalayam Po Karur 639111,Tamilnadu,India	India
Dr.V.S.Arulmurugan	Professor & Head Department of Electrical and Electronics Engineering Shree Venkateshwara Hi-Tech Engineering College, Gopichettipalayam Erode,638455	India
Dr.M.Murugesan	Assistant Professor Department of Electrical and Electronics Engineering,Karpagam Institute of Technology Coimbatore,641105	India
R Gopalakrishnan	Assistant Professor Department of Electrical and Electronics Engineering, Kongunadu College of Engineering India Tamil Nadu Tiruchirappalli,621215	India
VJ Vijayalakshmi	Assistant Professor Department of Electrical and Electronics Engineering ,Karpagam Academy of Higher Education,Coimbatore 641 021	India
T Ramesh	Assistant Professor Department of Electrical and Electronics Engineering , Mahendra College of Engineering Salem 636106	India
M Inba Arasi	Assistant Professor Department of Electrical and Electronics Engineering, Mahendra College of Engineering Salem 636106	India
S Suba	Assistant Professor Department of Electrical and Electronics Engineering, Mahendra Engineering College Mahendhirapuri, Mallasamudram West, Namakkal 637503	India
M Dinesh	Assistant Professor Department of Electrical and Electronics Engineering,Mahendra Engineering College Mahendhirapuri, Mallasamudram West, Namakkal 637503	India
R Aravindh	Assistant Professor Department of Electrical and Electronics Engineering, Kongu Engineering College Perundurai,Erode 638060	India
Dr.P.Venkatesan	Associate Professor Department of Electrical and Electronics Engineering, Mahendra Institute of Technology Mahendhirapuri, Mallasamudram, Namakkal DT 637 503	India

Abstract:

The aim of this design is to create a DC micro-grid system to integrate a Permanent Magnet Synchronous Motor (PMSM) and renewable energy sources. This micro-grid designed to provide reliable and efficient energy to the while reducing the environmental impact and cost of operation. The micro-grid system will combine a PMSM, energy sources, power converters, and a control unit to ensure the system's reliability and safe operation. The control unit will ensure that the system is able to manage power flow between the PMSM, renewable energy sources, and other loads connected to the micro-grid. Additionally, the control unit will be designed to prioritize the needs of the PMSM, ensuring that it is able to operate without interruption.

Complete Specification

Description:The proposed system can efficiently regulate the power flow between the PV arrays, battery bank, and load and control the PMSM speed through the power electronics converter . The DC/DC converter controls the renewable energy source's power flow to the DC bus, and the DC/AC converter converts the DC power to AC power. An energy storage system stores excess energy and releases it when required. The DC bus ensures efficient power delivery to the PMSM and other micro-grid components. The IoT system enables real-time monitoring of the system. Finally, the control system regulates the power flow between the components and the DC bus. This proposed system is a reliable and efficient alternative to traditional power systems for off-grid applications, as it integrates PMSM in a DC-microgrid system powered by PV sources.

By exploring and implementing these technologies, the efficiency and reliability of the DC micro-grid system can be significantly improved, making it a viable option for the integration of PMSM and renewable energy sources.

The DC micro-grid system ensures a reliable and consistent supply of energy to the PMSM, as the system is designed to be robust and fault tolerant. To ensure that the micro-grid system is operating at maximum efficiency, the system should be designed to optimize power utilization. This could include the use of advanced optimization algorithms, such as particle swarm optimization, or the use of optimization techniques.

This project has presented a new vision for the motor operation, which is the PMSM with dc micro grid system used for all purposes. A full and detailed description is made for every part of this system. This paper has also offered a user Internet of thing based data of the knowledge. In addition, the wireless monitoring method has been implemented.

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