

REVIEW ON DESIGN AND IMPLEMENTATION OF SOLAR TRAIN USING MATLAB

Prof. Shital Yende, Nisha Raut, Shabnam Shaikh, Ankit Dange, Rounak Agrey, Ravina Waghmare

Professor, Department of Electrical Engineering, Suryodaya College of Engg. & Technology, Nagpur, India

UG Student Department of Electrical Engineering, Suryodaya College of Engg. & Technology, Nagpur, India

Abstract

solar photovoltaic technology is one of the most important resources of renewable energy. However, the current solar photovoltaic systems have significant drawbacks, such as high costs compared to fossil fuel energy resources, low efficiency, and intermittency. This feature will help an extraordinary arrangement for the prosperity and will avoid the huge disasters of trains. The sun based sheets are open with the assorted size, shape, versatile and more power yield. Using the available sun situated sheets the chance of daylight based train can be executed. major and huge note is that it makes the train

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1. INTRODUCTION

For the immense measure of force needs for the trains to run can likewise be made conceivable with the sunlight based energy instead of utilizing the current diesel. The time has shown up and there is a great deal of shortage of the fuel and in 5 to 10 decades more there would be no fuel. So quite possibly the most fuel being burned-through are in trains and hence thinking of it as making the trains to be furnished with the sun powered would consummately help to decrease the shortage of the fuel and even the utilization of no exhaustible and eco-accommodating energy. Considering the train to furnish with the sun powered energy is certainly not a basic errand yet we consider it to make up. Despite the fact that wellbeing highlight will be the best execution for this thought that is the track-break recognition. This element will help a great deal for the wellbeing and will dodge the significant mishaps of trains. The sunlight based boards are accessible with the diverse size, shape, adaptable and more force yield.[1]

Utilizing the accessible sun powered boards the possibility of sunlight based train can be executed. The downside which emerges is the hefty force which should be given consistent capacity to the driving force of the train to pull around 21 compartments appended with it or significantly more. So there is a need of consistent ability to be furnished with paying little mind to the climate, accessibility of force or power of the sunlight based energy. The usage of this thought for another train makes the thought an exorbitant one and it slacks monetarily. Hence actualizing this thought for the current trains will not difficulty the speculation. Despite the fact that there is a tremendous venture yet there are enormous returns and reserve funds as well. The major and significant note is that it makes the train an eco-accommodating and even this will assist us with diminishing the shortage of the fuel accessible. Sun oriented trains are a cutting edge path way to deal with make individuals to acquire information about the sun based energy alongside the eco-accommodating force age framework Sunlight based photovoltaic (PV) organization on existing train's housetops has demonstrated to be perhaps the most suitable huge scope assets of supportable energy for metropolitan trains. There is a train in Delhi which will run from Sarai Rohilla in Delhi to Farukh Nagar in Haryana. It was dispatched on July 14 2017 which was the primary sun based controlled DEMU (diesel electrical various unit) train from the

Safdarjung rail route station in Delhi. A sum of 16

sun powered boards, each delivering 300Wp, are fitted in six mentors. The expense of these sun powered boards, produced under 'Make in India' activity, is Rs 54 lakh. This is the first run through in quite a while that sunlight based boards are being utilized as framework in rail routes. The train has a force back-up and can run on battery for in any event 72 hours. The sun oriented boards create around 17 units of force in a day which empowers the lighting framework in the mentor. Right now Railways will introduce sunlight based boards on non-AC mentors as it were. The rail routes are wanting to present almost 50 all the more such mentors in the coming days. Sun oriented force would be presented first in quite a while and later in significant distance prepares also. By saving an expected 1.2 lakh kilo liters of diesel consistently, the rail lines will actually want to take Rs 672 crore each year. The sun oriented force will likewise help in lessening 2.7 lakh tones of carbon dioxide emanation per year.

II The Concept

Sunlight based photovoltaic (PV) organization on existing train's housetops has demonstrated to be perhaps the most suitable huge scope assets of supportable energy for metropolitan trains. There is a train in Delhi which will run from Sarai Rohilla in Delhi to Farukh Nagar in Haryana. It was dispatched on July 14 2017 which was the primary sun based controlled DEMU (diesel electrical various unit) train from the Safdarjung rail route station in Delhi. A sum of 16 sun powered boards, each delivering 300Wp, are fitted in six mentors. The expense of these sun powered boards, produced under 'Make in India' activity, is Rs 54 lakh. This is the first run through in quite a while that sunlight based boards are being utilized as framework in rail routes [12]. The train has a force back-up and can run on battery for in any event 72 hours. The sun oriented boards create around 17 units of force in a day which empowers the lighting framework in the mentor. Right now Railways will introduce sunlight based boards on non-AC mentors as it were. The rail routes want to present almost 50 all the more such mentors in the coming days. Sun oriented force would be presented first in quite a while and later in significant distance prepares also. By saving an expected 1.2 lakh kilo liters of diesel consistently, the rail lines will actually want to take Rs 672 crore each year. The sun oriented force will likewise help in lessening 2.7 lakh tons of carbon dioxide emanation per yeat Vehicle Data Collection This Systems collects the data of vehicles related to the performance and quality of vehicles for study processing and remote monitoring. The system depends on vehicle gateway, server software plan, databases and web based interfaces. There are unit a spread of favorable circumstances to embracing a star home framework. Other than families, star home frameworks may offer force for resources, facilities, or little organizations. Having this splendid stockpile of daylight for the duration of the night may likewise deflect wild creatures that territory unit perilous or eat their harvests. They supplant fuel lights and candles verifiably utilized for lighting. Purchasing fuel or potentially candles might be an everyday cost that might be disposed of with a SHS. Besides, exhaust created from customary lighting techniques are harmful and lead to ongoing lung issues, particularly when kids are uncovered. By and large, a family can utilize with respect to three liters of fuel each month. Utilizing these rheostat wellsprings of daylight for discovering or handiwork creation will strain the eyes and cause long vision issues. Having a framework can allow adolescents to check and little organizations to proceed with creation later into the evening. This will expand the populace's capacity to be free, raises their earnings, and permits them to start to lift themselves out of destitution. The proposed framework chiefly comprise of sunlight based board, battery, what's more, the charge regulator. As the interest of power expanding step by step so for and the age of power is deficient to fulfill the fast development of power interest. So by utilizing this PV innovation we will make splendid the places of destitute individuals for their turn of events. The proposed framework utilizes a sunlight based board since it is more effective, so when light strikes the outside of the board at that point we get 12V yield which can be convert into 5V by transformer IC related this 5V is taken care of as a contribution to the charge regulator. The battery is charged utilizing a electrical gadget with a charge regulator in the middle of them. The charge regulator is utilized to shield the battery from cheating and profound releasing. When the battery is charged, a DC burden could be straightforwardly associated with the battery.[2]

III SYSTEM ARCHITECTURE

Where the whole rooftop top of the train compartments are being introduced with sunlight based boards with the best creation so it consumes the restricted space and give the more yield. Introducing the boards on rooftop isn't adequate for the necessary ability to run the train. So the board with the adaptable sun based boards would be an extraordinary wellspring of force age alongside the rooftop top boards. Further the energy put away on the battery can be utilized during the night when there is no daylight to run the trains. The energy extricated is separated into two lines where the one line encourages the train to run and the other line will

assist the batteries with getting charged. There is a control boards being introduced on the train so the energy being created is checked and assessed distance to be covered from the train with the leftover force can likewise be determined and shown so the Loco-pilot comes to know the distance which can be covered with the excess measure of energy.[2]

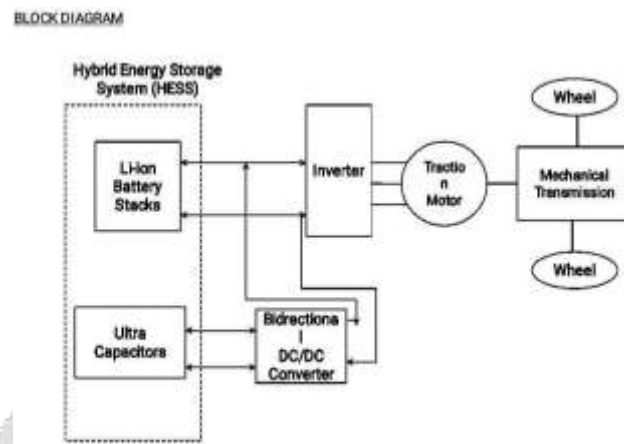


Fig. 1 MATLAB model of electric system of locomotive engine

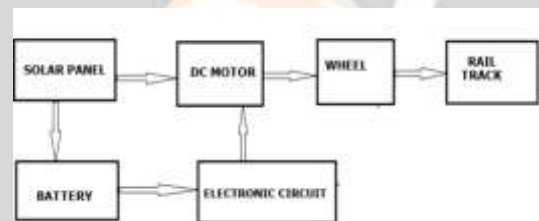


Fig 2 Block Diagram of Overall system

Considering this sun powered energy during the slow times of the year where there will be less time hours during the day where the daylight is accessible can be a downside yet this likewise can be settled.. There is no need to prepare the new trains with the solar panels but we can modify the existing trains with the solar panels so that there will be an alternate option to run the trains when there is no availability of sunlight or if the battery drains. The control panel has the monitor of the output of the panels, batteries charging rate, peak power generation rate, availability of power in batteries, estimated distance from the available batteries, power consumption of the train, features like track-crack detection and few more.

IV SYSTEM IMPLEMENTATION

Sun powered boards or a ton of actually electrical wonder (PV) boards are star home electrical framework conventional part. There are fluctuated kinds of electrical gadget anyway in the fundamental there are exclusively 3 kinds of electrical gadget for example mono crystalline, polycrystalline and nebulous slender film type solar board. Mono-glasslike cells are being cut out from ingot of unadulterated translucent. They are dark in shading and that they will retain most sunlight falling on a superficial level whenever set at right point. The effectiveness of mono-translucent cell is around 19-20%. Polycrystalline cells are being result of unadulterated component shorts. Dissimilar to mono-glasslike their cells are not completely adjusted one way and accordingly interconnection misfortunes may happen which lessens its productivity to 13-15%. Formless dainty film productivity is around 6-10%. The Panels are made of wafers or cells of semiconductor material that utilization daylight (photons) and the photovoltaic impact to create direct flow power. The entirely unexpected cell innovations are wont to address distinctive energy change efficiencies and creating procedures that are utilized in making an endeavor to downsize the cost of electrical wonder produced power. The electrical marvel innovation is ceaselessly developing step by step inside the heading of higher change intensity and lower cost. Each photovoltaic cell will create an arranged voltage and current underneath sure delivering and actual imperatives. An electrical gadget could be an arrangement and equal combinations of indistinguishable cells to come up with the predetermined force yield (current and voltage)[3]

V Conclusion

Closing to the last the Renewable energy are the best once for the present and future also. The utilization of this energy at present may not be proficient however there is a great deal of need for this energy use in future. The points of interest are move over the downsides. Actualizing the sun based force on the trains with the sun oriented boards will be an incredible activity for the railroads to engage the trains with sun based for the remainder of things to come without relying upon the energizes. However there is no train which totally runs on the sunlight based force in India. In future with the best innovation of creation we may accomplish upto 90-100% proficiency in sunlight based boards which will give more power. At the current this is an application level thought and there should be a trying and trail. There is consistently a space for act of spontaneity and for the groundbreaking thought accordingly accepting this we introduced our thought. Executing this thought will have the best advantages and great commitment to the general public and Indian rail route

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