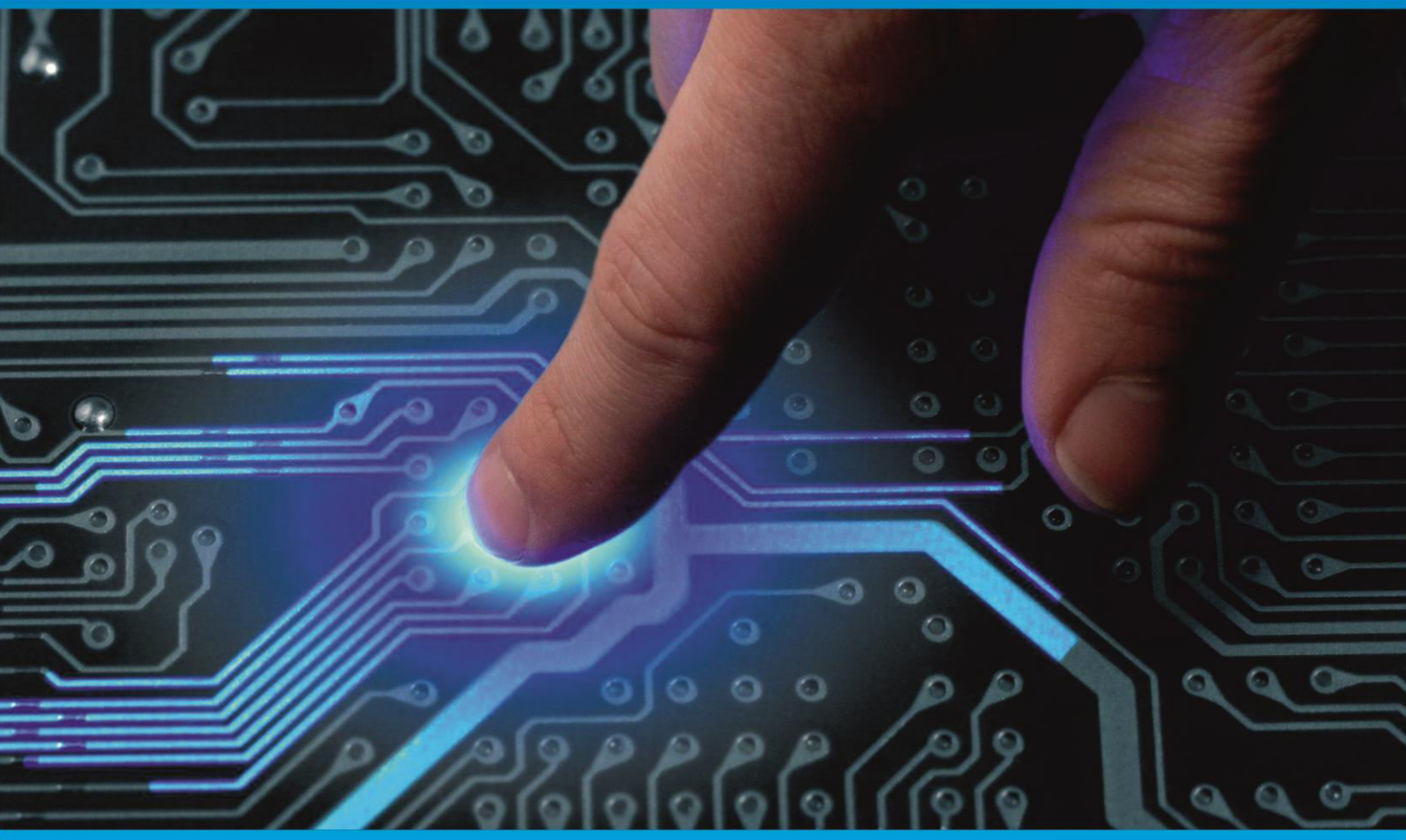
IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 4, April 2021

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.488

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.488 |

|| Volume 9, Issue 4, April 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0904062 |

Monitoring System for Solar Panel Using Smartphone Based on Microcontroller

G.S.Mujumdar, Vishakha Shastri, Anjali Ingale, Priyanka Karjule, Aboli Rathod.

Lecturer, Department of Computer Engineering, PCET's Pimpri Chinchwad Polytechnic, Pune, India

Diploma Student, Department of Computer Engineering, PCET's Pimpri Chinchwad Polytechnic, Pune, India.

ABSTRACT: Sun power is a standout amongst the most productive yet clean wellsprings of vitality we approach. There are no expanded fuel expenses or conditions, no connections to toxins, and it's both dependable and reasonable. Obviously, keeping in mind the end goal to bridle sun oriented power you require access to particular innovation. This tech depends on either little scale sun oriented photovoltaic (PV) systems but in main problem of photovoltaic (PV) system soil and dust particles accumulating on photovoltaic (PV) panels reduce the solar energy getting the cells, thereby falling overall power performance. We are solving the problem of this cleaning the PV panels is a problem of great practical engineering interest in solar PV power generation cleaning the photovoltaic (PV) panels is a problem of great practical interest in solar PV power creation. We are solve this problem discuss the methods for dust removal system using the Internet of things IoT .We are developing the simple and useful dust cleaning device and developed novel architecture of dust cleaning system for PV panel using IoT . The main motive for this system is developed system for dust cleaning for PV system using IoT and maintaining the clean PV panel efficiency.

KEYWORDS: Solar panel, cleaning, efficiency, PV, IoT

I. INTRODUCTION

Real time monitoring systems in photovoltaic (PV) power generation are very important and urgent in some cases. This paper proposes a real time monitoring system for solar panel using the atmega 2560 arduino which is connected with voltage sensor , current sensor and temperature sensor. The Arduino Atmega 2560 also connets with the wi-fi module as a connection to the smart-phone to display the measurements of current , voltage and power of solar panel and ambient temperatures through the app. This system is tested for 7 days starting at 06.00 AM to 06.00 PM. The designed monitoring system has the good degree of accuracy with an average error rate of monitoring results of solar panel output value below 10%.Monitoring the performance of solar panels using a smart phone-based microcontroller can be done in real time. The monitoring system can be developed for the lager PV systems.

II. RELATED WORK

Photovoltaic panel production has increased globally in response to the growing demand for solar energy. This has been the result of an increased awareness of the damage to the environment that using fossil fuel sources has had over the years. The photovoltaic panel (PV) consists of a collection of photovoltaic cells mounted to convert solar radiation into electrical energy through a photoelectric effect. Photovoltaic cells are made of silicon and extracted from the raw material of quartzite gravel. During the process, the quartz is crushed to obtain silicon dioxide and the raw materials need to undergo substantial processing until it can be used to produce photovoltaic cells. A PV is basically a p-n semiconductor junction. When exposed to light, a DC current is generated. PV offers several advantages such as: high reliability, low maintenance cost, no environmental pollution, and absence of noise . A residential PV power system enables the homeowner to generate some or all of their daily electrical energy demand on their own roof, exchanging daytime excess power for future energy needs (i.e. nighttime usage). The house remains connected to the electric utility at all times, so any power needed above what the solar system can produce is simply drawn from the utility. PV systems can also include battery backup or uninterruptible power supply (UPS) capability to operate selected circuits in the residence for hours or days during a utility outage. In fact, growing of PV for electricity generation is one of the highest in the field of the renewable energies and this tendency is expected to

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.488 |

|| Volume 9, Issue 4, April 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0904062 |

continue in the next years . As an obvious consequence, an increasing number of new PV components and devices, mainly arrays and inverters, are coming on to the PV market.

III. PROPOSED ALGORITHM

There are large solar panels at factory. It is time consuming work for person to clean it daily. To get maximum output from panels, cleaning daily is must. We are having timer which wil rotate cleaning brush on panels. Daily, automatically it will start. Use of IoT is , we can change timing using android app. Person will go to master panel & he will scan Bluetooth device & will change timing, once power come from solar module, it is given to UPS & from UPS to WiFi microcontroller. From android app, we can control street light which r getting power from solar. Also, by attaching relay we can control garden pump & other appliances. Here is urgency in improving the efficiency of solar power generation. Current solar panels setups take a major power loss when unwanted obstructions cover the surface of the panels.

In fact, growing of PV for electricity generation is one of the highest in the field of the renewable energies and this tendency is expected to continue in the next years. As an obvious consequence, an increasing number of new PV components and devices, mainly arrays and inverters, are coming on to the PV market. The output power generated from the conversion process is determined by some environmental conditions such as the intensity of sunlight, temperature, and the direction of sunlight and the spectrum of sunlight.

IV. FEATURES

1. Renewable Energy Source :- Among all the benefits of solar panel solar the most important thing is that the Solar Energy is it truly renewable energy source.
2. Reduce electricity bills.
3. Helps fight climate change.
4. Solar energy storage is expensive.

V. WORKING FLOW

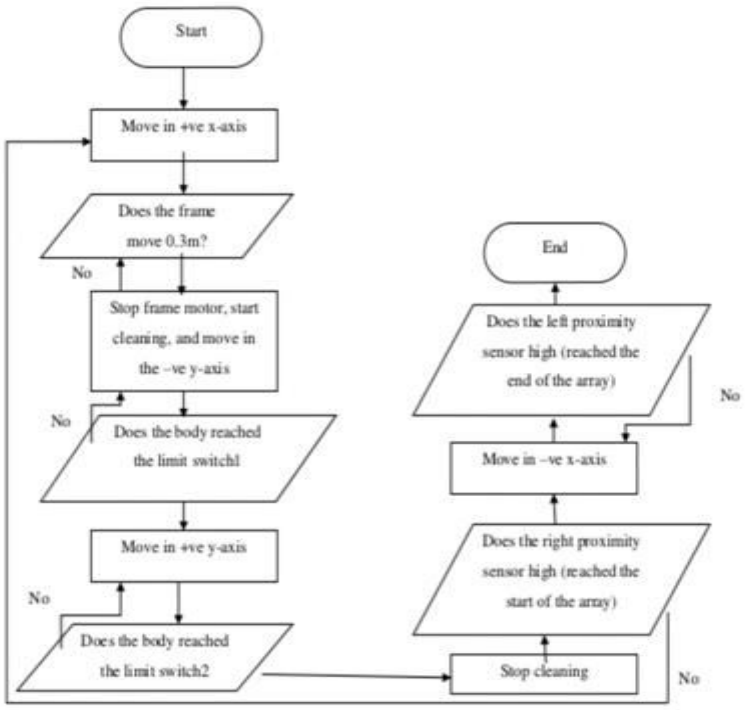


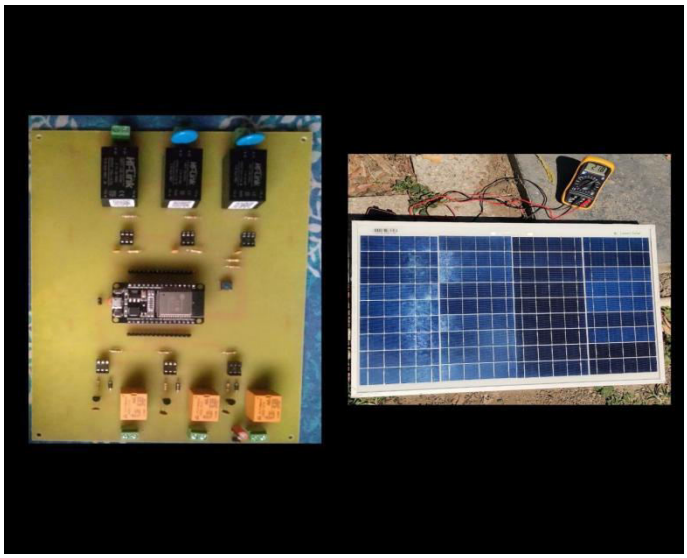
Fig. 3. Ad Hoc Network of 5 Nodes Fig 4. Energy Consumption by Each Node

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.488 |

|| Volume 9, Issue 4, April 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0904062 |

VI. RESULTS



VII. CONCLUSION

This paper provides the necessity of cleaning solar panels for increasing the efficiency is demonstrated and model amd working of new proposed machine with high efficiency and low cost is discussed.

In future this cost effective cleaning robot can be developed with device like dust sensor and cameras to check the deposition rate based on that cleaning process can be carried out and also it can be made to be controlled by remote which enable this as a user friendly.

REFERENCES

1. L. W. Thong, S. Murugan, P. K. Ng, C. C. Sun, 2017, ―Energy Efficiency Analysis of Photovoltaic Panel on its Operating Temperature‖, Journal of Engineering and Applied Sciences 12 (14).
2. Patel. H , 2008, ―Maximum Power Point Tracking Scheme for PV Systems Operating Under Partially Shaded Conditions, IEEE
3. 2001, ―A Guide To Photovoltaic (PV) System Design and Installation Prepared for California Energy Commission‖ , Prepared by Endecon Engineering and Regional Economic Research (California).
4. 2004, ―Trends in Photovoltaic Applications. Survey report of selected IEA countries between 1992 and 2003, Photovoltaic. Power Systems Program. Report IEAPVPS T1-13‖.
5. Calais M, Myrzik J, Spooner T, Agelidis VG., 2001,‖ Inverters for single-phase grid connected photovoltaic systems—an overview‖. In: IEEE power electronics specialists conference PESC'01.
6. M.R. Fachri, I.D. Sara, Y. Alway, 2015, ―Pemantauan parameter panel surya berbasis arduino secara real time", Jurnal Rekayasa Elektrika Universitas Syiah Kuala. 11.4.

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor:
7.488

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर
NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details