iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** I **Month of publication:** January 2022

DOI: https://doi.org/10.22214/ijraset.2022.39856

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue I Jan 2022- Available at www.ijraset.com

A Review on Monitoring Solar System Parameters Using IoT

Umang Deogade[1], Ritik Malkhede[2], Karuna Nimje[3], Twinkal Patil[4], Kunal Suryawanshi[5], Rahul Burange[6]
[1, 2, 3, 4, 5, 6]*Dept. of Electronics Engineering, K.D.K. College of Engineering, Nagpur*

Abstract: ***The most significant system for monitoring solar systems is the solar parameters monitoring system. Solar energy is a renewable energy source produced by solar panels. Solar energy is a renewable energy source produced by solar panels. Voltage, light intensity, and temperature are the parameters that the system measures. An Arduino Uno microcontroller board is used in the suggested monitoring system. Solar panel, LDR Sensor, LM 35, Arduino microcontroller, and resistors are used in the system. Light. LDR sensor is used to detect light intensity, L35 is used to measure temperature, and a voltage divider circuit is used to monitor voltage in this system.***

Keywords: ***Solar Panel, Monitoring, Renewable Energy, Solar Panel, Arduino Uno.***

I. INTRODUCTION

In many emerging nations, power generation is a crucial component. Energy consumption is at an all-time high as the industrial and commercial sectors improve. As a result, we are all drawn to renewable energy sources in order to generate green energy to fulfil our energy needs. This can aid humanity in reducing greenhouse gas emissions and ozone layer depletion in the future. Solar photovoltaic technology is gaining popularity as a result of its wide availability, low cost, and ease of installation and maintenance. When devices are connected via a communication protocol and a cloud platform, the Internet of Things (IoT) becomes smarter and more user-friendly. Basic characteristics such as voltage, light intensity, and temperature have an impact on the solar panel's efficiency. As a consequence, a real-time solar monitoring system is required to improve the PV panel's performance by comparing it to the trial result and taking preventative action. Solar energy has been the subject of a lot of research in recent years. To achieve strong performance, machine intelligence methods are also applied for predicting.

II. LITERATURE SURVEY

Shaheen Rasheed proposed final year project "solar panel parameter using Arduino" was published in the Imperial International Journal of Eco-friendly Technology by the Department of Electronics and Communication Engineering at KPR Institute of Engineering. We suggest that the solar panel power plant be monitored using IoT technology. Temperature, light intensity, current, and voltage are all being measured. We must convert the analogue signal to a digital format or signal before displaying it on a 16x2 LCD display. Measurement is also done with the help of several extra circuits.

SS Karthik (2016) presented the Arduino IDE and writing the project's code is how our project works. The LDR sensor detects light intensity, the temperature sensor (LM35) detects temperature, the current sensor (ACS712) detects current, and the voltage sensor detects voltage, all of which are sent to the Arduino. The data is sent from the Arduino to the 16x2 LCD display. With the aid of the Arduino IDE, the code does all calculations.

Ilavarasi, P.U. (2017) proposed Temperature, humidity, day/night mode, and power generation are all monitored by the sensor. WSN based on GSM (wireless sensor network). The state of the load is tracked using data and stored in an EEPROM. Emergency load condition using embedded system and wireless technologies.

Amith Infant.B (2017) presented Photovoltaic cells in the solar module convert solar energy into electric energy. In the system, a set of solar cells that are connected in series or parallel. A photovoltaic solar panel transforms sunlight into photons, which are then converted into electrical energy. There are two types of solar panels (mono-crystalize and poly-crystalize). The Internet of Things (IoT) is the next level of connection. The Internet of Things (IoT) introduces a technological vision. The sensor is linked to the internet of things, allowing it to gather and transfer data over the internet. The server will automatically update the real-time data flow.

Naveen Virmanini (2018), who presented the topic "Solar energy measuring system," advocated that sensors be used to assess solar cell properties in order to get data and improve the solar panel's power reference. This article was published in the Global Journal of Research Analysis. IIM College of Engineering's Mechanical Engineering Department. Voltage, current, temperature, and light intensity are all sensor measuring characteristics that are shown on a 16x2 LCD display through a PIC microcontroller (PIC16F877A) that sends hyper terminal data over a 2.4GHz serial link.

Pankaj Singh (2018) presented Photovoltaic panels turn sunshine into photons, which are then converted into electrical energy. There are two types of solar panels (mono-crystalize and poly-crystalize). LDR is a semiconductor-based light-dependent resistor. When light falls on a machine that has the same frequency as it. The IV IN4007 is a maximum reverse bias AC to DC converter. The LM35 temperature sensor measures temperature in Celsius and has a range of -55 to +150 degrees Celsius. The PIC microprocessor measures analogue values, converts them to digital, and displays them on a 16x2 LCD display.

V.Kavitha (2019) presented a way for monitoring "a smart solar PV monitoring system utilizing IOT" such temperature, current, voltage, and irradiance to boost the performance of PV in response to the rising demand for energy. To determine performance, we use 'LABVIEW Software.' Solar energy is a carbon-free source of energy. The internet of things is currently upgrading technology to make it smart. We're utilizing an ARM-based Wi-Fi CC3200 microcontroller. Irradiance/Pyrometer, temperature sensor (LM35), current sensor (ACS712), voltage sensor The CC3200 is a system on chip (SoC) with WI-FI connection and a high-speed ARM M4 CPU, as well as 256kb of RAM and internet access (802.11b/g/n).

V.Malathi (2019) presented project trial from 10:00 a.m. to 5:30 p.m. With a 125-watt solar panel, an LM35, and a Pyrometer. And the code for the CC3200's Wi-Fi Module functionality is written in C using the Energeia IDE. To transfer the values/data to the cloud platform, we used the 'BLYNK' libraries. The parameter is successfully presented in serial monitor by the mobile app and web server.

Adediji Y.B (2020) provided a technique for monitoring Voltage, Current, Light Intensity, Temperature, and Pressure Display on LCD using an Arduino-based solar power parameter measurement system with data logger. When are we going to be able to create the most solar energy? As part of my final year project at the University of Ilorin, I participated in a curricular activity.

The solar power monitoring system utilizing Arduino and its components was proposed by Akintola J. B (2020). A photovoltaic solar panel transforms sunlight into photons, which are then converted into electrical energy. There are two types of solar panels (mono-crystalline and poly-crystalline). The light intensity of a solar panel is monitored using an LDR, which measures in LUX. Temperature and pressure are measured using BMP180 sensors. The current parameter is indicated by the ACS712 Sensor, which senses 240 volts and outputs 5 volts.

M. A. Afolay (2020) recommended that software programming be used to determine voltage, current, temperature, LDR, and pressure, as well as other parameters. Temperature and LDR sensors are in analogue format, which we must convert to digital using an ADC module and programed in the Arduino IDE (integrated development environment), then link the Arduino to a laptop or desktop through a USB (universal serial bus) connector. To simulate the circuit design schematic and upload the programed using the Arduino IDE, we utilized Proteus ISIS software.

Ibrahim S. M. (2020) conducted a three-day test using a monocrystalline solar panel rated at 20 watts and a load of a 10 watt DC bulb, measuring voltage, light intensity, temperature, and pressure. In a tabular style, we have recorded the maximum and low temperatures, voltage, lux, and pressure for the previous three days.

III. CONCLUSIONS

One recommended method of lowering environmental effect is to use Renewable Energy technology. Because of the frequent power outages, it is critical to use renewable energy and keep track of it. The user is guided through the examination of renewable energy use through monitoring. This method is economical. The system's efficiency is around 95%. This makes it possible to use renewable energy more efficiently. The temperature sensor aids in the study of solar energy storage. As a result, the electrical problem is lessened. We presented work on the design and construction of a solar panel parameter reading node using Arduino for environmental monitoring; the node is sufficient to give information about environmental factors such as temperature, voltage, and light intensity.

REFERENCES

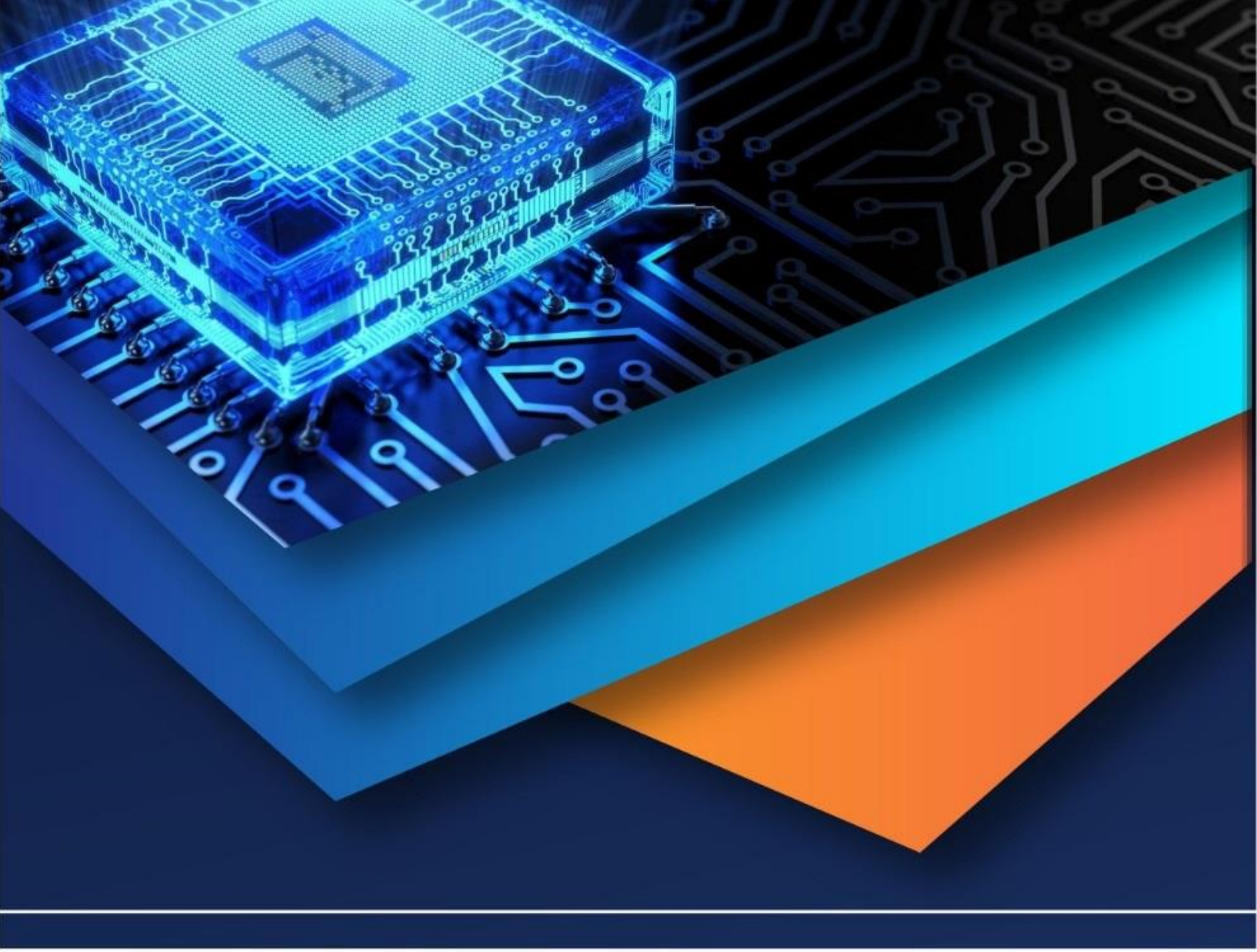
[1] SHAHEEN RASHEED*KARTHIK SS*Electronics and Communication Engineering, Institute of Engineering and Technology "SOLAR PANEL PARAMETERS MONITORING WITH ARDUINO" Imperial International Journal of Eco-friendly Technologies Vol. - 1, Issue-1 (2016), pp.129-134. Young,The Technical Writer's Handbook, IIJETM. University Science, Mill Valley, CA, 1989.

[2] S. Padma1, P.U. Ilavarasi,2Assistant Professor, Amith Infant.B, Anusan.K4U.G scholars, Department of EIE, Velammal Engineering College, Chennai, India "Monitoring of Solar Energy using IOT" Indian Journal of Emerging Electronics in Computer CommunicationsVol.4, Issue 1 (2017) Page.596- 601

[3] Naveen Virmanini, Pankaj Singh, Prakhar Kumar, Prashant Bhati, Rinku Gupta, Rohit Gupta Department of Mechanical Engineering, IIMT College of Engineering, Greater Noida, U. P., India" SOLAR ENERGY MEASUREMENT SYSTEM" volume -7, ISSUE-2 February-2018

[4] V. Kavitha1 and V. Malathi21PhD Scholar, Department of Electrical and Electronics Engineering, Anna University Regional Campus, Madurai, India2Professor, Department of Electrical and Electronics Engineering, Anna University Regional Campus, Madurai, India "A SMART SOLAR PV MONITORING SYSTEM USING IOT" 2019

[5] Oladimeji I.1*, Adediji Y. B.1, Akintola J. B.1, M. A. Afolayan1, O. Ogunbiyi2, Ibrahim S. M.3, Olayinka S. Z. "DESIGN AND CONSTRUCTION OF AN ARDUINO - BASED SOLAR POWERPARAMETER-MEASURING SYSTEM WITH DATA LOGGER" ARID ZONE JOURNAL OF ENGINEERING, TECHNOLOGY & ENVIRONMENTAZOJETE June 2020. Vol. 16(2):255-268Published by the Faculty of Engineering, University of Maiduguri, Maiduguri, Nigeria.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY