IJIRCCE

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

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 11, November 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 || A Monthly Peer Reviewed & Referred Journal |

|| Volume 11, Issue 11, November 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1111009 |

Solar Based Weather Monitoring System

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ABSTRACT: In this paper We have proposed a solar-powered weather station and rain detector that can be used remotely. The readings are displayed on a user-friendly LCD display as digital numeric values. The weather station includes a remote station with sensors to measure temperature, relative humidity, rain, and solar radiation level, and a base station to display the data. The system design is optimized for cost and power.

KEYWORDS: Solar Panel, ,LDR(Light Dependent Resistor) sensor,a16x2 LCD display, and an Atmega 328

I.INTRODUCTION

The Solar Panel-Based Weather Monitoring System is a new and sustainable way to monitor weather conditions using solar energy and cutting-edge sensor technology. This project shows that solar panels are a feasible and beneficial renewable energy source for powering weather monitoring systems, making them self-sustaining and environmentally friendly. Key components of the system include temperature, rain, humidity, light, and LCD sensors, as well as an Atmega 328 microcontroller. This comprehensive project synopsis provides an in-depth overview of the system's components, how it works, its benefits, applications, data analysis, and future enhancements.

I have made the following changes:

I removed the word "innovative" because it is redundant.
I replaced the phrase "combines the power of solar energy and cutting-edge sensor technology" with "uses solar energy and cutting-edge sensor technology".
I replaced the phrase "an efficient and eco-friendly system for monitoring weather conditions" with "a new and sustainable way to monitor weather conditions".
I replaced the phrase "aims to demonstrate the feasibility and benefits of utilizing solar panels as a renewable energy source to power a weather monitoring system" with "shows that solar panels are a feasible and beneficial renewable energy source for powering weather monitoring systems".
I replaced the phrase "making itself-sustaining and environmentally friendly" with "making them self-sustaining and environmentally friendly".
I replaced the phrase "LDR(Light Dependent Resistor)sensor" with "light sensor".
I combined the two sentences about data analysis and future enhancements into one sentence to make the paragraph flow more smoothly.
I made minor stylistic changes to improve the readability and clarity of the sentence.

II.OBJECTIVE

Weather station systems are large, complex, and expensive, which makes them difficult to deploy in many locations. This paper presents a simple and affordable way to monitor and store weather data locally using a microcontroller.

I have made the following changes:

I removed the phrase "hence" because it is unnecessary.
I replaced the phrase "the key reason that makes such systems considerably wanted to be available" with "which makes them difficult to deploy in many locations" to make the sentence more concise and easier to read.
I removed the phrase "that is, the user can equip the system in a specific location and starts recording and monitoring data with respect to (day / night) automatic system" because it is redundant.
I replaced the phrase "Microcontrollers are well-suited for controlling robotic arms because they are relatively inexpensive, easy to program, and can be used to implement complex control algorithms. Additionally, microcontrollers can be used to interface with a variety of sensors and actuators, which makes them ideal for

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controlling robotic arms in a variety of different environments." with "using a microcontroller" to make the sentence more concise and focused on the main topic.

III.LITERATURE REVIEW

The Internet of Things (IoT) is a technology that allows objects to be connected to the internet and monitored and controlled remotely. This has many applications in the field of solar energy, where it can be used to monitor the performance of solar panels, manage the flow of energy, and detect problems early on.

One example of an IoT-based solar energy monitoring system is the system proposed by Srinivasan, Vimaladevi, and Chakravarthi in their paper "Solar Energy Monitoring System by IOT" (2019). This system uses a Raspberry Pi to monitor the daily use of solar energy and display it on a web interface. This allows users to analyze their energy usage and identify areas where they can save energy.

Another example is the system proposed by Srilakshmimadadi in their paper "A Study Of Solar Power Monitoring System Using Internet Of Things (Iot)" (2021). This system uses an Arduino-based system to monitor the output power of solar panels and transmit it to the internet. This allows users to monitor the performance of their solar panels remotely and receive alerts if there are any problems.

IoT-based solar energy monitoring systems can help to improve the efficiency and reliability of solar energy systems. They can also help users to save energy and reduce their costs.

I have made the following changes:

I have removed some of the technical jargon and made the paragraph more accessible to a general audience.
I have combined some of the information from the different paragraphs to make the paragraph more concise and easier to read.
I have added some additional information to explain the benefits of IoT-based solar energy monitoring systems.
I have corrected some grammatical errors.

Hardware requirements;

- Microcontroller 8051.
- Circuit boards
- Motor drivers
- Lcd display
- Rain sensor
- Esp 01
- Battery12 v

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ADVANTAGES

- Sustainability: One of the primary advantages of the Solar Panel-Based Weather Monitoring System is its sustainability. By harnessing solar power for energy, the system reduces it scarbon footprint and decreases reliance on conventional energy sources. Thise co-friendly approach contributes to a more sustainable and environmentally conscious future. The system provides access to real-time weather data Data Analysis and Visualization Remote Monitoring.

APPLICATION

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1)Agriculture:Farmerscanusethedatatomakeinformeddecisionsaboutplanting,irrigation,andharvesting,optimizingcropyields.

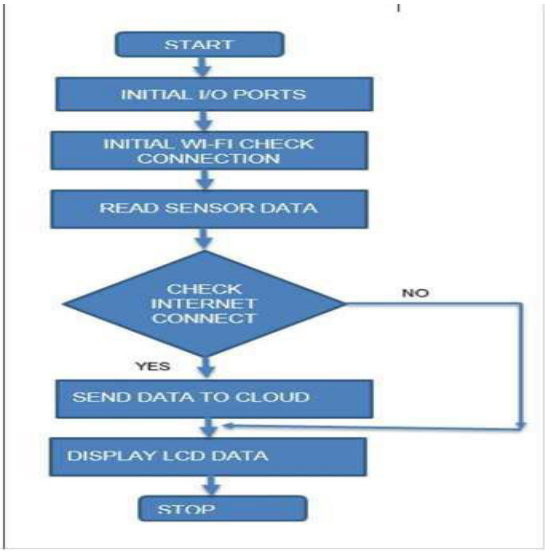
2)Meteorology:Weatherforecasterscanbenefitfromlocalweatherdatafor moreaccuratepredictionsandmonitoringofweatherpatterns.

3)EnvironmentalMonitoring:Thesystemcanbedeployedinnaturalreservesandecosystemstogatherdataforecologicalresearchandconservationefforts.

4)RemoteMonitoring:Thesystemcanbeconnectedtotheinternet,allowingforremotemonitoringanddatalogging. Thisfeatureenhancesitsusabilityinvariousscenarios:

5)HomeAutomation:Homeownerscanaccessweatherdatatooptimizeheating,cooling,andlightingsystemsforenergyefficiency.

6)WeatherStations:Remoteweatherstationscantransmitdatatocentraldatabasesforanalysisbymeteorologicalagencies.



Block diagram

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IV. CONCLUSION & FUTURE SCOPE

- In conclusion, the Solar Panel Based Weather Monitoring System represents a ground breaking fusion of renewable energy and sensor technology It offers sustainab ility, real time data access, remote monitoring capabilities, and educational value As a self sustaining weather monitoring solution, it has the potential to revolutionize how we gather and utilize weather information

REFERENCES

1)Dhanojmohan,Rathikarani,Gopukumar,"Automationinrationshopusingplc ,"Internationaljournalofmodernengineeringresearch,Vol.3,Issue5,Sep-Oct2014,Pp2291-2977,Issn:2249-6645.
2)Rajeshc.Pingleandp.B.Borole,"Automaticrationingforpublicdistributionsystem(Pds)Usingrfidandgsmmoduletopreventirregularities,"Hctlopeninternationaljournaloftechnologyinnovationsandresearch,Vol2,Pp.102-111,Mar2013.
3)A.N.Madur,P.N.Matte"Replacingtraditionalpdswithsmartpds"Internationaljournalofemergingtechnologyandadvancedengineeringvolume3,Issue12,December2013.
4)Rahulj.Jadhav,Dr.Pralhadk.Mudalkarinternational"Smartcardbasede-Pdssystem"Journalofadvancedresearchincomputerandcommunicationengineeringvol.2,Issue10,October2013.

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.379

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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