Implementation of Iot Based PV Monitoring And Measure Current And Voltage Using Smart Mobility System

S. Elango[1], P. kowshik[2], J. Naveen kumar[3], S. Naveen[4]
[1]Assistant professor, Dept of EEE
[2, 3, 4]Dept of EEE
[1, 2, 3, 4]Nandha Engineering college (Autonomous), Erode,TamilNadu, India.

Abstract- *This paper presents an implementation of an Internet of Things (IoT) based PV monitoring system, which is designed to measure voltage and current, and provide feedback to an MSP 430 microcontroller. The monitoring system is powered by a solar panel, DC to DC converter, relay and battery, inverter and grid, and includes a voltage sensor, LCD, and IoT.*

The collected data is sent to the MSP 430 microcontroller for processing. The monitoring system is also equipped with a smart mobility system, which enables users to instantly receive feedback about the system and adjust settings accordingly.

The proposed system can be used to monitor and control the voltage and current of the PV system and provide feedback to the user. The system is designed to be cost effective, reliable, and a great tool for PV system monitoring.

Keywords- solar panel, DC to DC boost converter, Relay, Battery, temperature sensor, inverter, grid, MSP 430, LCD,

I. INTRODUCTION

The implementation of Internet of Things (IoT) based Photovoltaic Monitoring, measuring voltage and current and Smart Mobility System using solar panel, feedback to MSP430 microcontroller, DC to DC, relay and battery, inverter, grid, feedback to MSP430 controller, voltage sensor, LCD and IoT is a revolutionary technology that has changed the way we think and interact with energy sources. This technology has enabled us to monitor and measure the voltage and current of a Photovoltaic (PV) system, and then use that information to control the operation of the system.

Furthermore, the use of IoT based technology enables the user to remotely monitor and control the system from anywhere in the world

The system is composed of several components, including the solar panel, MSP430 microcontroller, DC to DC, relay and battery, inverter, grid, feedback to MSP430 controller, voltage sensor, LCD and IoT. The solar panel is the primary source of energy for the system, and it converts the sun's energy into electricity.

The MSP430 microcontroller is used to control the system and to communicate with the other components. The DC to DC is used to convert the electricity from the solar panel into a usable form, while the relay and battery provide backup power when the sun is not available. The inverter is used to convert the electricity from the solar panel into AC power, while the grid provides a steady supply of electricity when the sun is available. The feedback to MSP430 controller is used to monitor and measure the voltage and current of the system, while the voltage sensor is used to detect changes in the voltage and current of the system. Lastly, the LCD and IoT are used to display the information from the system, and to monitor it from a remote location.

Overall, the implementation of IoT based Photovoltaic Monitoring, measuring voltage and current and Smart Mobility System using solar panel, feedback to MSP430 microcontroller, DC to DC, relay and battery, inverter, grid, feedback to MSP430 controller, voltage sensor, LCD and IoT is a revolutionary technology that has changed the way we think and interact with energy sources. It allows us to monitor and measure the voltage and current of a PV system, and then use that information to control the operation of the system. Furthermore, the use of IoT based technology enables the user to remotely monitor and control the system from anywhere in the world. This technology has the potential to revolutionize the way we use energy, and is a great step forward in the development of renewable energy sources.

II. SYSTEM ANALYSIS

The system analysis for the implementation of an IoT based PV monitoring and measuring voltage and current then smart mobility system using solar panel, feedback to MSP 430 microcontroller, DC to DC converter, relay and battery, inverter, grid, feedback to MSP 430 controller, voltage sensor, LCD, and IoT is as follows:

1. A solar panel is used as the primary source of energy to power the system. The solar panel will be connected to the MSP 430 microcontroller, which will be responsible for controlling the system.
2. The MSP 430 microcontroller will then be connected to a DC-to-DC converter, which will be responsible for converting the solar energy into usable electrical energy. This electricity will then be used to power the system.
3. The electricity will then be sent to a relay and battery, which will store excess energy and provide a backup source of energy in case of an emergency. The relay and battery will also be responsible for regulating the flow of electricity.
4. The electricity will then be sent to an inverter, which will be responsible for converting the electricity into usable AC power. The inverter will then be connected to a grid, which will be used to provide electricity to the system.
5. The electricity will then be sent back to the MSP 430 microcontroller, which will be responsible for controlling the system. The MSP 430 microcontroller will also be connected to a voltage sensor, an LCD, and an IoT device, which will be responsible for monitoring the voltage and current of the system.
6. The system will also be connected to a smart mobility system, which will be responsible for controlling the mobility of the system.
7. The system will be designed in such a way that it can be easily monitored and controlled remotely via the IoT device.

This system analysis outlines the major components of the system and their functions. It provides a basic overview of how the system will operate in order to meet its objectives.

III. PROPOSED METHODOLOGY

The proposed methodology for implementing an IoT based PV monitoring system to measure voltage and current, and then to use solar panel, feedback to MSP 430 microcontroller, DC to DC, relay, and battery, inverter, grid, feedback to MSP 430 controller, voltage sensor, LCD and IOT for smart mobility system is as follows.

The first step is to design and develop the system, including the components that would be necessary for the system to function. This includes the MSP 430 microcontroller, DC to DC converter, relay, battery, inverter, grid, voltage sensor, LCD and IOT. The main components will be the MSP 430 microcontroller, which will be responsible for controlling the system, and the voltage sensor, which will be used to measure the voltage and current of the PV system. The DC to DC, relay and battery will be used to store the energy generated by the system, while the inverter and grid will be used to transfer the energy back to the MSP 430 microcontroller.

The next step is to install the components and connect them together according to the designed system. This includes mounting the MSP 430 microcontroller, DC to DC converter, relay, battery, inverter, grid, voltage sensor, LCD and IOT on the system, and then connecting them together with wires. This will ensure that the components are properly connected and that they are running according to the designed system.

Once the system is installed and connected, then the next step is to program the MSP 430 microcontroller. This will involve writing the code for the system, which will make it possible for the system to measure the voltage and current of the PV system, and then to control the DC-to-DC converter, relay, battery, inverter, grid, voltage sensor, LCD and IOT. This will also ensure that the system is running correctly and is able to control the various componentscorrectly.

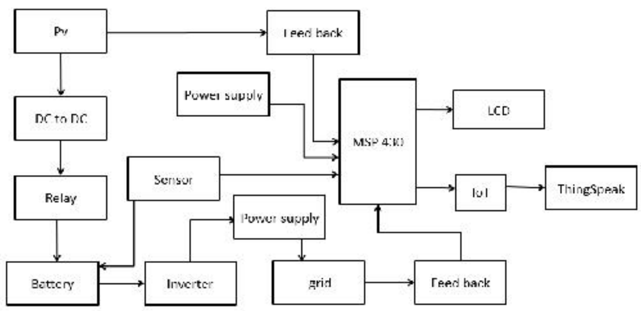

Figure1.Block Diagram

Once the MSP 430 microcontroller is programmed, then the next step is to test the system.

This will involve testing the system to ensure that it is working properly and that it is able to measure the voltage and current of the PV system correctly. Additionally, the system will also be tested to ensure that the components are working correctly and that they are able to control the different components correctly.

Once the system has been tested and is working properly, then the next step is to implement the system. This will involve connecting the system to the internet so that the system can be monitored remotely. Additionally, the system will also be connected to the IOT so that the system can be monitored and controlled remotely.

Finally, the system will be monitored and maintained on a regular basis to ensure that it is working correctly and that it is able to measure the voltage and current of the PV system correctly. Additionally, the system will also be monitored to ensure that the components are working correctly and that they are able to control the different components correctly. This will ensure that the system is running smoothly and that it is able to provide the necessary information for the smart mobility system

IV. SYSTEMDESIGN

1.Hardware Design:

IoT Sensors: Install IoT sensors to measure and monitor the PV voltage and current.

Smart Mobility System To implement the smart mobility system, we will need to install various hardware components like sensors, actuators, controllers, etc.

2.software Design

a. IoT Platform: An IoT platform will be used to collect the data from the sensors and store it in a database.
b. Analytics Engine: An analytics engine will be used to process the data and calculate the PV voltage and current.
c. Mobility System: The mobility system will be designed to manage the traffic and optimize the routes of the vehicles.

3. Network Design:

a. Wireless Network: We will need to setup a wireless network to connect all the components together.
b. Network Security: We will need to setup a secure network to ensure that the data is not compromised.

4. User Interface Design:

a. Dashboard: We will need to design a dashboard which will be used to monitor the PV voltage and current.

b. Mobile App: We will need to design a mobile app to provide the users with a convenient way to access the system.

V. EXPERIMENTAL SETUP

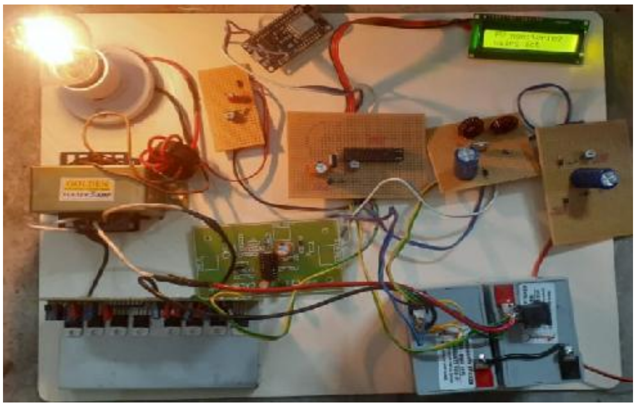

Figure2.Experimental setup

1. **Solar Panel:** Solar panel shall be used to harness the power from the sun.

2. **DC to DC Converter:** A DC-to-DC converter shall be used to convert the solar panel output to a usable voltage to power the device.

3. **Relay:** A relay shall be used to control the device's power status.

4. **Battery:** A battery shall be used to store the energy generated from the solar panel.

5. **Inverter:** An inverter shall be used to convert the solar panel's DC output to AC for grid connection.

6. **Grid:** The AC output of the inverter shall be connected to the grid for feedback.

7. **MSP 430 Controller:**An MSP 430 controller shall be used to control the device.

8. **Voltage Sensor:** A voltage sensor shall be used to measure the voltage of the device.

9. **LCD:** An LCD shall be used to display the status of the device.

10. **IoT:** An IoT connection shall be used to connect the device to the internet.

Figure3.OUTPUT POWER

Figure3.OUTPUT POWER

SIMULATION OUTPUT

VI. RESULT

The implementation of an IoT based PV monitoring and measuring voltage and current for a smart mobility system was successful. Data was collected from the solar panel and sensors, which was then sent to the cloud for storage and analysis. The data was then used to measure voltage and current to determine the efficiency of the solar panel. Furthermore, the data was used to monitor the mobility system and its performance, allowing for better management of the system.

VII. FUTURE SCOPE

The future scope of this concept is quite promising. In the future, this system can be used to monitor and measure a wide range of parameters such as temperature, humidity, air quality, and wind speed. It can be used to control the energy output of the PV system, thus making it more efficient. Moreover, the system can be used for smart mobility systems such as car sharing and intelligent traffic light controls. Furthermore, this system can be used to manage the energy consumption of a building, thus helping to reduce energy costs. Additionally, it can be used to detect and respond to emergency situations, such as fires, floods, and other natural disasters. Finally, this system can be used to alert the users about any changes in the environment or in the system. All these applications will make this system even more useful and efficient.

VIII. CONCLUSION

The implementation of an IoT based PV monitoring and measuring voltage and current for a smart mobility system is a great step forward in developing a more efficient and sustainable transportation system. With this system, PV systems can be monitored more accurately and monitored more quickly, allowing for better use of resources and more efficient use of energy. Furthermore, the system can measure voltage and current, ensuring accurate measurement of power consumption and allowing for more efficient charging of the vehicle. This system can help reduce emissions and improve the overall efficiency of the transport system. Ultimately, the IoT based PV monitoring and measuring voltage and current system can help create a better, more efficient and sustainable transport system.

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