“IOT BASED DIGITAL CHARGE CONTROLLER”

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Abstract: Solar Inverters are highly in demand for the alternative source of electricity. The home Inverter and off grid inverter are mostly use everywhere. These inverters are not able to monitor online as well as having only one battery bank to provide the backup supply. We propose the system which can be used with these inverters to put the normal inverter online as well as two battery banks to increase the life of battery and to reduce the maintenance cost.

Sometimes, electricity can be cut-off due to natural disasters often happened. So, this type of energy such as wind energy, hydraulic energy and solar energy, they are needed as the source of electricity. The advantages of choosing solar energy by using a solar panel are that the lifetime of solar panel is long lasting than any other source of energy. The solar charging system is very important and necessary to use for people live in rural areas. Now a days, we use the sun as a natural source of energy. Solar resource is unlimited the government is trying to implement the use of solar panels as energy source in rural and suburban areas for lighting the street lights power.

Keyword: NodeMCU, OLED, Relay.

Introduction: Solar home lighting system are photovoltaic systems which offers cost effective solution to supply energy to remote off-grid areas. Solar energy sustains life on Earth for all plants, animals and people because it provides an exciting solution for all the societies to meet their needs for clean, abundant sources of energy in the future. The main source of solar energy is the nuclear reaction at the core of the Sun, where the energy comes from the conversion of hydrogen into helium.

Solar energy is transmitted to the Earth in the form of electromagnetic waves, which can also be represented by photons. The Earth, therefore, is essentially a huge solar energy collector receiving large quantities of solar energy which can be seen in various forms such as plant photosynthesis, and evaporation of the oceans resulting as rain which forms rivers and provides hydropower energy.
Internet of things is a future technology in the industry products. It mainly deals with cloud computation, Machine learning, Business Analytics. IOT can be dealt both from embedded point of view as well as application perspective. IOT from the application point of view deals with deploying Customized Web application on the cloud for Data logging and diagnostics. From the embedded point of view a microcontroller is the heart of the project, From the Microcontroller the data can be sent through wired mechanism or wireless technique. In this project the Wi-Fi module is connected to the Micro controller through UART. Any electrical device can send some key parameters to the Microcontroller which processes it and sends the telemetry messages to the Wi-Fi module which in turn sends the same to the cloud. The main advantage of this is a performance of the device can be monitored at any place using the parameters which we sent to the cloud.

Literature Review:


The objective of this paper is to send telemetry data from the solar based charge controller to Microsoft Azure IOT Hub using bare metal STM32 microcontroller and ESP8266 Wi-Fi module. An attempt has been made to reduce the overall memory consumption while connecting to the cloud.

Methodology:

This is digital solar charge controller for off-grid solar power system to monitor the voltage and battery charging mode on WIFI network. Then both batteries operated by relay alternately.

There are two batteries connected and working of both batteries are depend on voltage. If one battery voltage is less than 5 volt then automatically is in charging mode and other battery will be in live mode if require and vice versa. If battery A will discharge then it will connect in charging mode via Relay and then battery B will connect in live mode.

Controller system generally uses a controller connected to battery. A charge controller is used to maintain the proper charging voltage on the batteries.

As the input voltage from the solar array, the charge controller regulates the charge to the batteries preventing any overcharging. A Solar charge controller is placed between the Solar Panel Array and the Battery to control the amount of electric energy produced by solar panels going into the batteries. The advantage of choosing solar energy by using a solar panel are that the lifetime of solar panel is long lasting than any other source energy. Solar energy has become a promising alternative source. Because it has many advantages such as abundance, pollution free and renewability.
The system status of Battery and voltage will be monitor on WIFI network devices like mobile or laptop via IP address assigned to the system. And the is to send telemetry data from the solar based charge controller to Wi-Fi network using NodeMCU microcontroller which is ESP8266 Wi-Fi module.

Solar energy in recent years has attracted more attention to people due to inefficiency and unavailability of power for different use in homes and industries. Sometimes, electricity can be cut-off due to natural disasters often happened.

Solar On grid system will cut off if the Grid supply will off and can be monitor online. Solar Offgrid system will continue on even if the grid supply is off as it uses Batteries.
CONCLUSION

The main objective of the study is to provide alternate lightning system by using solar energy. The system taken for study consists of a Solar panel of 10W, a 12 V battery, a solar charge controller. The charge controller maintain the flow of charge to the battery i.e. it provides protection against the overcharging and deep discharging of the battery.

ACKNOWLEDGMENT

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RESULT:

PARAMETERS:

<table>
<thead>
<tr>
<th></th>
<th>Maximum voltage of Battery1</th>
<th>12V</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Maximum voltage of Battery2</td>
<td>12V</td>
</tr>
<tr>
<td>2</td>
<td>Battery switches to charging if the voltage is</td>
<td>&lt;5V</td>
</tr>
<tr>
<td>3</td>
<td>Battery switches to working if the voltage is</td>
<td>&gt;5V</td>
</tr>
<tr>
<td>4</td>
<td>Maximum voltage of Solar Panel</td>
<td>12V</td>
</tr>
</tbody>
</table>
REFERENCES:


[5] “How to Build an Off Grid Solar Power Plant” By 3OTUwebmaster@6lpie.comU30T


[16] Introduction to Power Electronics by Danial W. Hart.