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Bluetooth Control Home Automation using Arduino and Solar Panel

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ABSTRACT-

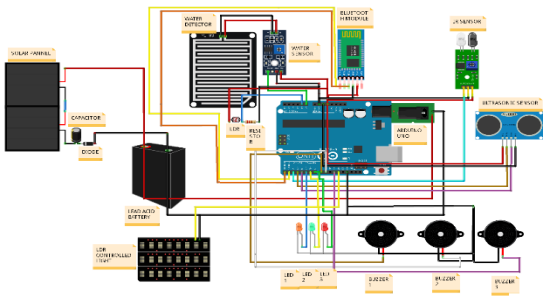
The design of a solar-powered smart home with a wireless sensor network is presented in this study, which addresses smart energy management, smart health care, smart ventilation, and smart people management. [1]For wireless communication, two Internet of things (IoT) design prototypes is used: one using Bluetooth for short range offline communication and the other using Global system for mobile communication (GSM) for long-range offline communication. The solar panel provides energy to the smart house, which ensures maximum efficiency. When the owner is unavailable, internal infrastructure can intervene in some unanticipated situations.[2]

Keywords: IOT, Home automation, Arduino, Bluetooth Module,Relays, Sensors, Solar panels.

Introduction :

We are living in technological era. Home automation system is an application of technology which is controlled by our smart phone. It helps us to make our home more secured and less the human labor, time and energy. Now a days we cannot think of ourselves without phone especially smart phone. Smart phone is not only a phone. It is more than a phone which is also used to control the home appliances.[2]This research paper is based on IOT based Home Automation will enable the user to use Home appliances conveniently and efficiently. The modern homes and their appliances are controlled through Bluetooth. The user send commands through input which will be obtained by the Bluetooth module. The Microcontroller has an interface with this module. Wireless Smart Home and Home automation are the dual aspects of this paper. Owner can make arrangements such as switching ON various appliances inside the house, which are connected and controlled by the microcontroller. User will be at full comfort zone as there is no need of manual controlling of appliances; it is like changing to the favorite T.V. channel with the help of TV remote. Thus using the same set of sensors the problems of home security can be solved . The IOT based Home Automation will enable the user to control Appliances and devices conveniently. This paper provides the solution of the problem where the user needs to control the devices physically and due to any issue there maybe delay in switching ON/OFF the devices that causes energy wastage. This system provides a better way to save energy in efficient way with use of latest technology. [3]

Circuit diagram

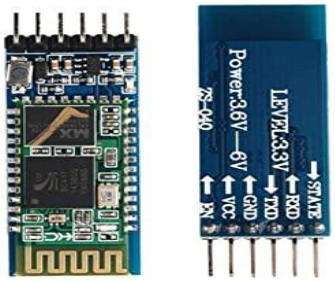


Main Components Of Solar Inverter And Home Automation System

Solar Panel :A solar panel (also solar module, photovoltaic module or photovoltaic panel) is a collection, connected assembly of solar cells, also known as photovoltaic cells. The solar panel can be used as a component of a larger photovoltaic system to create and supply electricity in commercial and residential applications. Because a solo solar panel can produce only a limited amount of power, many installations contain several panels. A photovoltaic system typically consists of an array of solar panels, an inverter, and sometimes a battery and interconnection wiring

Arduino UNO: The Arduino Uno is a microcontroller board based on the ATmega328P. 1) It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog feed in, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a recalibrate switch. 2) Simply connect it to a laptop with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Bluetooth Module (HC-05) :1) For the communication between a mobile phone and a microcontroller Bluetooth module(HC-05) is used. 2) HC-05 is a low power 1.8V operation and is easy to use with Bluetooth SPP (serial port protocol). 3) Serial port Bluetooth modules have a Bluetooth 2.0+EDR (enhanced data rate), 3Mbps modulation with complete 2.4GHZ radio transceiver and baseband. 4) Using Bluetooth profile and android platform architecture different types of Bluetooth applications can be developed.



Relay: 1) Relay is basically an electromagnetic switch which can be turned on and off by applying the voltage across its contacts. 2) This project used a 12V 4-channel relay.[4]

Working: The whole circuit is been powered Arduino UNO (Board) and Board is powered by Rechargeable Lead Acid Battery and that is powered by Solar Panel. It contains a code which uploaded to the board. And once it simulated you can start using your circuit. The main role of working the model is based on a renewable source of energy solar energy. Solar panel is responsible for whole working of the model. Solar panel provide power to Lead acid battery through a capacitor followed with diode which help us to provide constant voltage and constant power and also to prevent reverse charging. We

can control the whole model by using our mobile by just connecting our phone Bluetooth with the Bluetooth module present in module. We can easily turn on and off light control the activity of all the circuit when there is no need of Automatic Light we can turn of that feature. When there is no need of object or human detection we can easily turn it of. We can get the alert on our mobile of rain and object range.[5]

Advantages :•

- Quick responseis achieved.
- Easy to maintain and repair.
- Design is efficient and low cost.
- Power consumption is low.
- Controlling electrical devices wirelessly
- Saves electricity.
- We can control appliances from any place round the room[6]

Conclusion:

However, the efficiency of the solar cells is increasing, while the price is decreasing. However, the efficiency of the solar cells is increasing, while the price is decreasing. At same time, the efficiency of the LED light is in a rapid increase, but the prices are lower. Automatic light control mechanism saves the power and energy. And it is step towards the automation world. So following development of the outdoor lighting technic, the solar LED light system has shown us it will have promising application and infinite vitality.[10]

Future Scope :Since the system require external power supply of 5 volts and 3.3 volts for its operation which can be taken free of by utilising the power produce by solar panel only. Also with the help of motor and controlling it is likely to path the sun.[15]

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