

# A Review Paper on the Performance of Solar Cells for Indoor Autonomous Wireless Sensors

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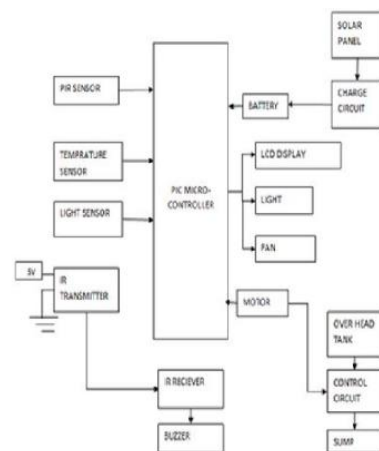
**Abstract:** The performances of six photovoltaic cell technologies for indoor energy harvest area unit assessed below a controlled strength of seventy seven.40  $\mu\text{W}/\text{cm}^2$ . A comparison of the calculated efficiencies of crystalline (c-Si), crystalline (poly-Si), amorphous atomic number 14 (a-Si), perovskite, metallic element compound (GaAs) associated dye-sensitized star cells (DSSC) shows that each DSSC and GaAs star cells exhibit a potency of  $\sim 28\%$ , whereas the efficiencies of perovskite and a-Si star cells area unit twenty.4% and 15.59% severally. Considering each performance and value, DSSC is that the best option for indoor light-weight energy harvest. Attributable to its high power density of twenty-two.0  $\mu\text{W}/\text{cm}^2$ , the DSSC needs a district of fifteen  $\text{cm}^2$  to charge a three.4 mAh reversible battery from a nominal voltage of two.8 to 3.0 V in hr.

**Keywords:** Wireless sensing element networks, Batteries, Photovoltaic cells, Sensors

## I. INTRODUCTION:

Solar power is that the modification of daylight into electricity, either directly victimization photovoltaic's (PV) or indirectly victimization sturdy alternative Energy (CSP). Concentrated alternative energy systems use lenses or mirrors and pursuit systems to center an oversized region of daylight into a little beam. Photovoltaics translate light-weight into electrical phenomenon by victimization the electrical phenomenon result. Building automation is that the aim that a Building Management System or a (further recent terminology) Building Automation System (BAS) makes an attempt to accomplish. Each area unit samples of a distributed system - the pc networking of electronic devices designed to look at and management the mechanical, security, fireplace and flood safety, lighting (E, HVAC and wetness management and ventilation systems in an exceedingly building. generally, building automation systems implement Control loops which will extent across massive areas of the building. These management loops need a reliable communication between the sensors, actuators and therefore the procedure controller. Once the buildings area unit designed with the likelihood of building automation in mind, the communications are often enforced victimization dissimilar wired networks. Once speaking of intelligent buildings, aboard the automation, external Communications, transmission and plenty of alternative aspects, it's necessary to rely on falling the facility consumption and

group action energy sources. The most effective doable technique is to style a wise device that attracts power from a electrical phenomenon sheet and powers the automation modules.



## II. PROJECT DESIGN:

### 2.1 star panels:

The star PV panel is employed, in essence, to entice the incident daylight and charge the battery to be kept for future use. The panel is adjusted at specific inclination to change most point pursuit. This provides most Efficiency and most of the daylight that falls on the panel is keep. The panel that we tend to area unit creating use of encompasses a rated capability of twelve volts and 5Watts power ideally.

### 2.2 Passive infrared sensing element:

A passive infrared sensing element (PIR sensor) is associate electronic sensor that measures infrared (IR) light-weight diverging from objects in its field of read. they're most frequently utilized in PIR based mostly motion detectors.

#### 2.2.1 Operational principle

- All objects with a temperature on top of temperature emit energy within the type of radiation. Typically this radiation is invisible to the human eye as a result of it radiates at infrared wavelengths, however it are often detected by electronic devices designed for such a purpose.
- The term passive during this instance refers to the very fact that PIR devices don't generate or radiate any energy for detection functions. They work entirely by detective

work the energy given off by alternative objects. it's necessary to notice that PIR sensors do not observe or live "heat" instead they observe the infrared light emitted from associate object that is completely different from however usually associated/correlated with the object's temperature (e.g., a detector of X-rays or gamma rays wouldn't be thought of a heat detector).  
 •A PIR-based motion detector is employed to sense movement of individuals, animals, or alternative objects. They're usually utilized in thief alarms and automatically-activated lighting systems. They're usually known as merely "PIR", or typically "PID" for "passive infrared detectors". The PIR sensing element is placed at the doorway so it will observe human presence and through the night it will even set out a thief alarm once needed. The output of the PIR sensing element is given to the PIC microcontroller and is interfaced consequently. Alarm application once used as a part of associate alarm, the physics within the PIR usually management a little relay. This relay completes the circuit across a try of electrical contacts connected to a detection input zone of the thief alarm board. The system is typically designed such if no motion is being detected, the relay contact is closed—a 'normally closed' (NC) relay. If action is detected, the relay opens, triggering the alarm.

2.3.1 Temperature sensor:

We will live temperature a lot of accurately than a employing a thermostat. The sensing element electronic equipment is sealed and not subject to chemical reaction. The LM35 generates the next output voltage than thermocouples and should not need that the output voltage be amplified. It's associate output voltage that's proportional to the astronomer temperature. The dimensions issue is .01V/ deg C. The LM35 doesn't need associate external activity or trimming and maintains an accuracy of +/-0.4 deg C at temperature and +/- zero.8 deg C over a variety of zero deg C to +100oC. Another necessary characteristic of the LM35DZ is that it attracts solely sixty small amps from its offer and possesses a coffee self heating capability. The sensing element self-heating causes but zero.1 deg C temperature rise in still air. The operational temperature vary is from -55 deg C to a hundred and fifty deg C. 2.4 lumen thirty five style and dealing

Pin No	Function	Name
1	Supply voltage; 5V (+35V to -2V)	Vcc
2	Output voltage (+6V to -1V)	Output
3	Ground (0V)	Ground

We use luminous flux unit thirty five in our project for automatic activate and turn off of the fan within the presence of human. The temperature should even be higher than the set threshold of thirty one deg C. luminous flux unit thirty five is employed since correct temperature activity isn't required conjointly its low-cost n simply offered within the market.

2.5 LDR sensors:

LDRs or light-weight Dependent Resistors square measure terribly helpful particularly in light/dark sensing element circuits. Unremarkably the resistance of AN LDR is incredibly high, generally as high As a thousand 000 ohms, however after they square measure lighted with light-weight resistance drops dramatically. The animation opposite shows that once the torch is turned on, the resistance of the LDR falls, permitting current to labor under it. The predetermined resistance will be turned up or right down to increase or decrease, during this means it will build the circuit additional or less sensitive. The LDR is employed to sense the sunshine changes and thence decide whether or not it's day or night. The brink worth of the resistance will be modified in keeping with the necessity. The output of the sensing element is interfaced with the PIC microcontroller and also the output drives the applications just like the fan and lightweight. If it's day the lights square measure turned off and if its night the lights square measure turned on. equally betting on the temperature the Fan is turned on or off.

CONCLUSION:

In this paper we tend to mentioned regarding building automation system mistreatment alternative energy. we tend to designed star circuit, PIR sensing element circuit, LDR circuit, and temperature sensing element circuit, automatic water level sensing element circuit with success beneath the steerage of our internal and external guide. Building automation of late is especially used for each leisure and security purpose because of increase in rate. Our project addresses these problems. large data was gained whereas we tend to were operating for our project and also the literature surveys and careful study helped U.S. in our work.

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