



# **Evaluation of Power from Solar Panels Utilization and Power Theft Identification System**

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**ABSTRACT:** In this paper reveals the genre step in generation of electricity and availability of natural resources without disturbing the global environment. We implemented the generation of power from solar panels. Now a days the energy saving is becoming significant part of the economy. Conversion of Solar Energy to Electrical Energy. Utilization of the power produced and billing of the power utilized and indication of power theft. The street lights should be maintain to turn ON and OFF at the right time. These are implementing with the ARM Processor and the driver unit. Solar Panels are used here to convert the solar energy to electrical energy. The produced energy is stored in batteries to utilize later. An inverter is used to convert the DC power to AC power. GSM technology is used to send the usage power and also added power theft indication to this energy is counted and data is sent to the personalized number. The stored energy is used for domestic areas purposes and industries.

**KEYWORDS:** ARM, Driver Unit, Relays, Batteries, solar panels.

## **I.INTRODUCTION**

According to the law of conservation of energy, Energy can neither be created nor be destroyed. As we all aware of that power cries in world so that we have many different ways to generate the power from coal, wind, solar, nuclear power etc. in this paper we will find the different ways to generate the power from solar panels. Solar panels [1] energy is energy which observers from the sun rays. So that the solar panels are charges from the sun rays a solar cell is a solid state electrical device (P-N junction) that junction coverts the energy of light directly into electricity (DC) by using the photovoltaic Effect.

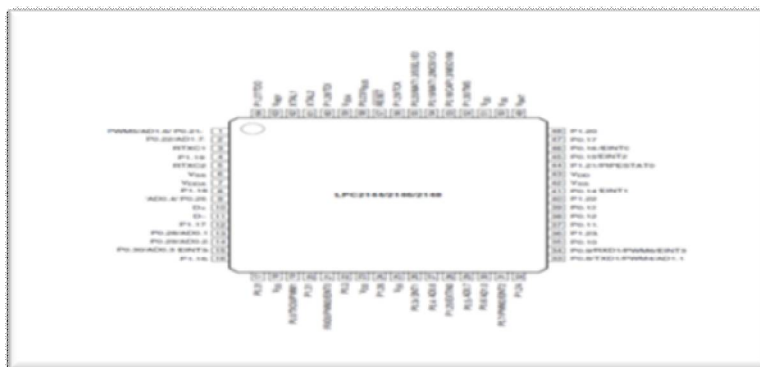


Fig1: LPC2148 Microcontroller 64-pin IC

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The photovoltaic cell makes the process of conversion to the first requires a material which absorbs the solar energy, and then slowly raises an electron to a high level energy state, and then the flow of this high-energy electron to external devices. Solar panels are charged sun rays and it stores in battery systems provide power supply for complete 24 hours a day irrespective of Bad weather conditions and different global and geographical location we can extract a large amount of power from solar radiations The microcontroller block is playing a major role in this project work. The micro controller chip used in this project work is LPC2148 and this is like heart of the project. The LPC2148 microcontroller is a 64-pin IC

## II.SYSTEM MODEL AND ASSUMPTIONS

### Experimental procedure

we implemented the generations of power from solar panels and power is saved in the batteries conversion of power from DC to AC [7] [8] by using inverter ,these power can be used to run the processor and others components in the circuit. And step up and step down transformers are also used to run the processor with 12v supply

Block diagram

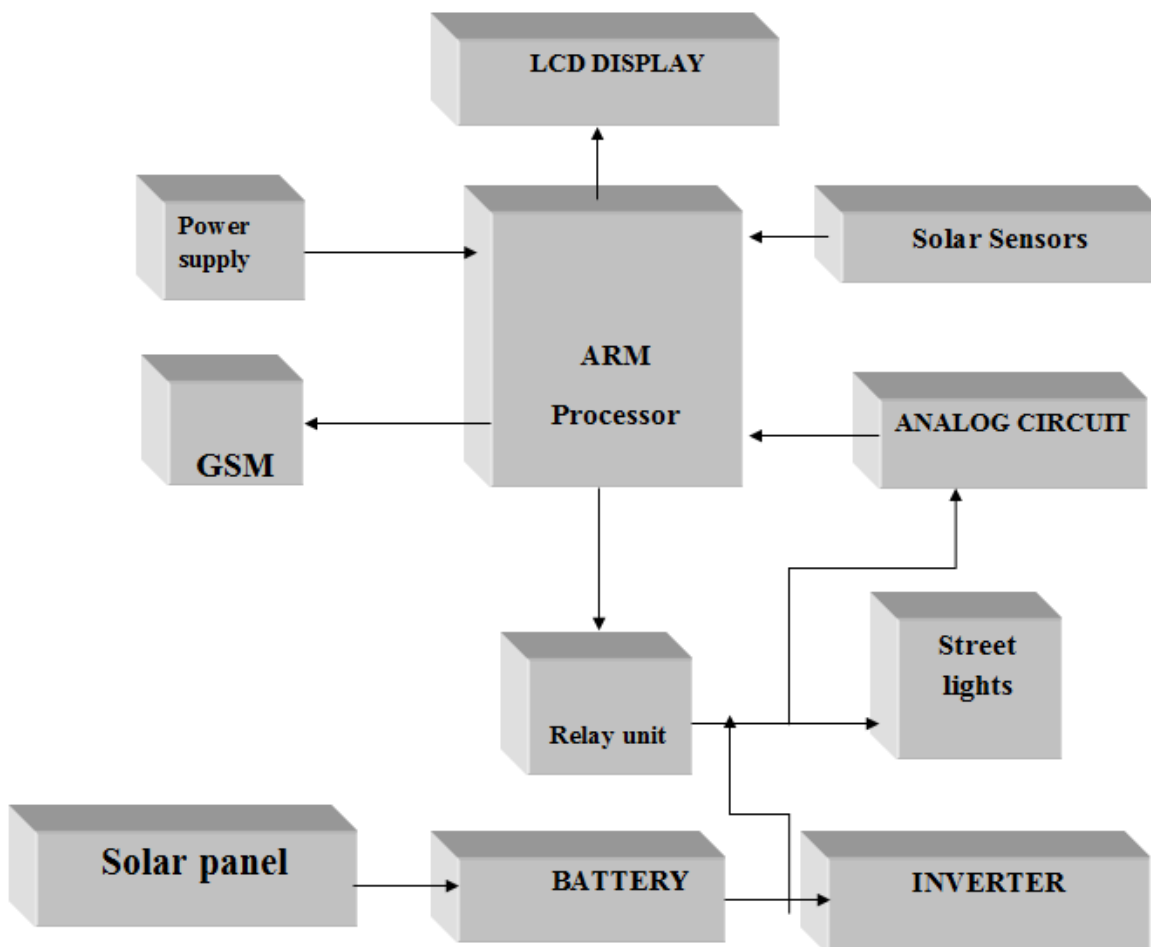


Fig2: Power Generation From Solar Panels Utilization And Theft Identification System

**LCD Display:** liquid crystal display [2] is electronic visual display as we know that it is seven segment display technology is used for display are widely used in electronic meter, calculators, mobile phones etc. this device is used to display the power consumption reading details in the display board.

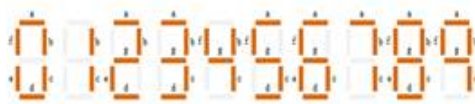


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**Power supply:** it is an device which is used for the electronic devices like mobile phone and electronic gadgets that supplies electronic energy. The primary function of the power supply in electronic [9] devices is to convert one form of electrical energy to another power supply



Decimal Digit	A	B	C	D	E	F	G
0	x	x	x	x	x	x	
1		x	x				
2	x	x		x	x		x
3	x	x	x	x			x
4		x	x			x	x
5	x		x	x		x	x
6	x		x	x	x	x	x
7	x	x	x				
8	x	x	x	x	x	x	x
9	x	x	x			x	x

Fig3: LCD Display system concept

**GSM:** it stands for global system for mobile communications it is cellular network. In GSM technology it elevates in 5 factors macro, micro, pico, femto, and umbrella cells. In this paper we implement the GSM technology for the subscriber identity module (SIM) this sim card is used to send the message of the power billing systems and theft identification

**Solar sensors:** Its energy is emitted as radiation mostly due to the solar surface temperature. We know that according [3] to laws of Plack’s Law the electromagnetic spectrum of the sun light includes wavelengths which coming from the infrared rays to the ultraviolet rays. we used the solar sensors for the detecting the rays

**Relay unit:** The purpose of using relays in our project is mostly to access the process in the remote control switches and which are used in many real time applications. A relay is usually an electromechanical device that is actuated by an electrical current. The current flows in the devices it automatically acts like opens the switch and closes the switch. All relay contain a sensing unit, the electric coil, which is powered by AC or DC current. In this paper we used in three basic functions [4] of a relay ie., ON/OFF control, Limit control and logic operation.

On/Off control: street lights

Limit control: motor speed control

Logic operation: Test equipment testing points on the device or circuit under test

**Battery:** it is used to store the power from the solar panels

**Inverter:** Inverters are used to convert the alternate current to direct current AC to DC vice versa.

### III. RELATED WORK IMPLEMENT SYSTEM

In this paper we implemented the generation of power from solar panels. The panels which observe the sun rays and generate the power with the help in photovoltaic effect is the creation of current or voltage which exposure to light and covert the solar energy in to electrical energy. The produced energy is store in the batteries to utilize later. The stored energy is used for the domestic or industries purpose Now a days the energy saving is becoming significant part of the

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economy. Example Street light turns ON/OFF on right time so for the mechanism we used the relay unit to turn OFF/On automatically.

In this we used the step up transforms and step down transforms for the house hold purposed we are using 230v supply unit [5] [6]but the analog circuit unit which means the ARM controller unit it supports only the 12v supply for the purpose we used the three transforms. We have written the code for the GSM technology to send the billing information to SIM card only for the register mobile number at the same time it send the information of power theft identification

## IV.SECURITY SYSTEM FOR POWER THEFT SYSTEM

Identification of power theft for the example in the industry the daily usage is power is 300watts so we write the code to the 3000watts with the permission the owner of the industry they are trying to use above 3000watts the owner will immediately get the message that power is using above 3000watts by using the keil software for scripting language to the user defined language system to the GSM system.

## V. RESULT AND DISCUSSION

In this working model we observed the converting the solar sun rays to the battery system and power saved in the large battery panels to save the power and used for the industries and house hold purpose system the below fig shows the without out power supply and with power to the system

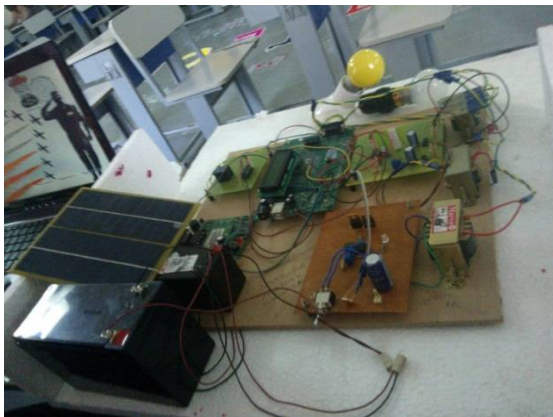


Fig4: without power supply

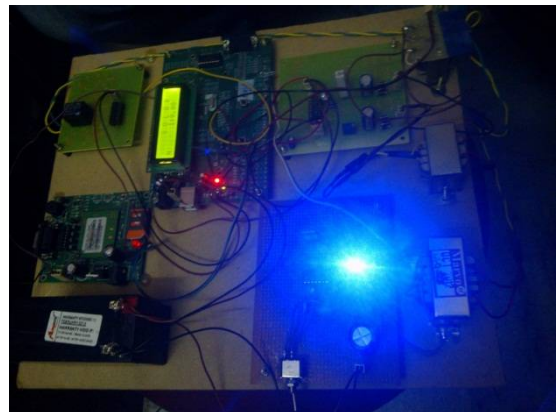


Fig5: with power supply

In the above working model are implemented with plane printed circuit board which is connected outside the solar panel and battery and implementation the board we find the step up and step down transformers and zero voltage to 100 volts maximum as the prototype.

## VI.CONCLUSION

In this paper we implemented this project as proto type we generated the power from the solar panels it saved in the batteries for later usage. The scope of the project is to implement this system in industries and gated communities for the usage of the power in the power cries world. We can also generate the power from different ways but it is natural source environmental system. The main dram back is to require the large power storage devices to store the energy. We regretfully thanks to teaching and non- teaching staff of KITE College AND IARE College.

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