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# IMPLEMENTATION OF SOLAR WATER PUMP CONTROLLED WITH FOUR DIFFERENT TIMES FOR POWER SAVING APPLICATIONS

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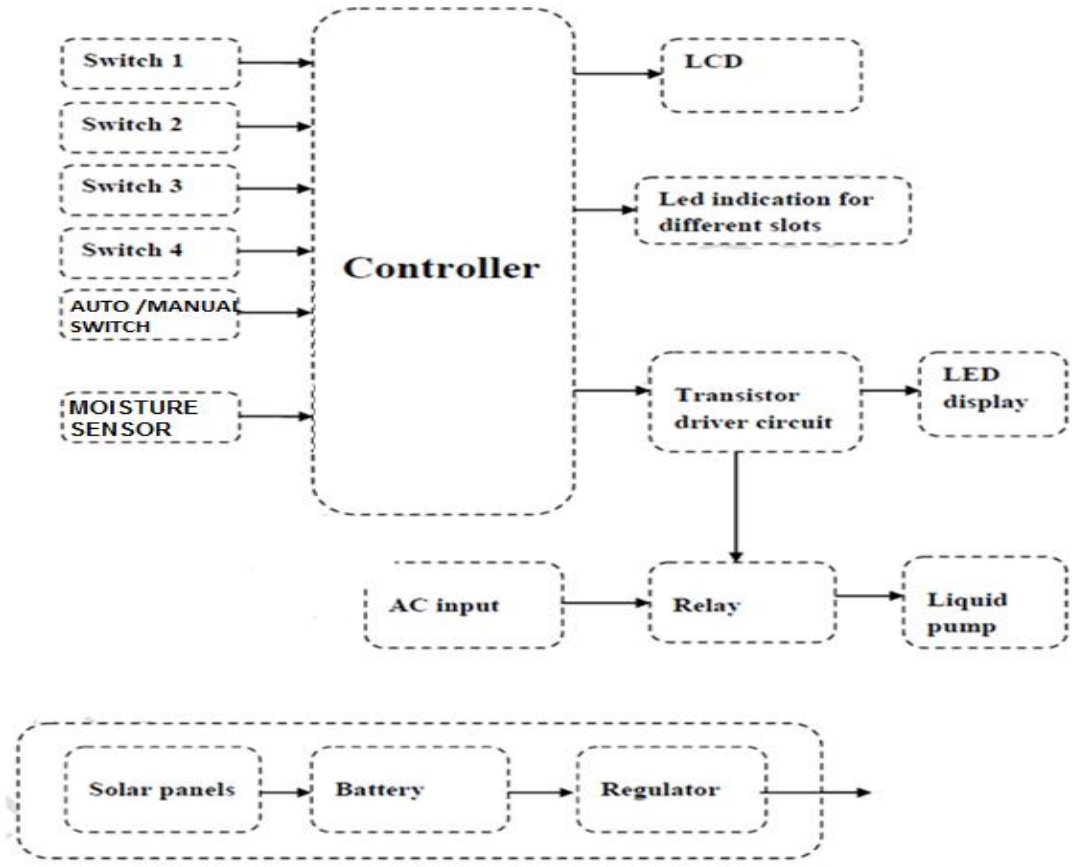
**ABSTRACT:-** *Form olden days we are using non renewable sources of energy in excess mount for our needs. As this type of minerals like coal etc are exhausting so we have to depend on the renewable sources of energy like solar, wind, etc. For smaller application it is better to use renewable energy. As this project is based on streetlight automation and required Ac supply. So for this particular application we are using solar panels to charge the DC battery and the power from the battery can be used for this application. This project is an innovative solution to operate a machine / motor / liquid pumps for a small duration. If a machine is to be operated for ten minutes, and should be switched off after the duration, it is too difficult and many times we forget to switch it off the system after the prescribed time. This project provides the facility of automatic switch off after the requited time duration. This is achieved by using the MCU. Four push-to-on switches are connected to one port of the microcontroller. These four switches are to provide four different fixed time constants.*

*A 16X2 LCD is connected to the microcontroller to display the status of the pump. Contrast of the LCD can adjust by using a preset which is connected to it.*

*A transistor is used to drive the relay during the active time period. 5V double pole - double through relay is used to control the AC liquid pump. LED indication is provided for visual identification of the relay / load status. A switching diode is connected across the relay to neutralize the reverse EMF.*

**BLOCK DIAGRAM:**



***HARDWARE REQUIREMENT***

- PIC Micro Controller
- Regulated Power Supply Unit
- 16x2 LCD
- Moisture sensor
- PUSH BUTTON

***SOFTWARE REQUIREMENT***

- CCS COMPLIER

PICKIT-2 for Programming

***Working:***
This project uses PIC 16F877A MUC , which is heart of the system, this project as two modes of operation auto/ manual mode, in which auto mode as automatic water pump action based on soil moisture sensor, if moisture is high then pump truns off and if moisture is low then pump turn on. Other mode of operation is manual mode where it as 4 timer options like 30sec, 60 sec, 120sec and 240 sec. So when powered is on its checks for first auto/manual mode if button is pressed then it goes for auto mode, if button is released then it goes for manual mode. In auto mode pump on and off based on soil moisture sensor. In manaul mode MUC waits for timer button press and pump on and off takes according to timer action.

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# *ADVANTAGES:*

- Power can be saved
- Decreases the man power

# *APPLICATIONS:*

- Agriculture
- Industries
- Homes

***FUTURE SCOPE:***

With advancements in technology, the systems can be made more user_ friendly .The proposed system can be further enhanced by developing a GSM model. The user can control the motor pump from a remote location using his mobile phone. The user can also get the water level indication of the reservoir and overhead storage tank on his mobile phone. these technologies are already available in the market, through presently they are not so popular.

Furthermore, to check the appropriateness of the soil, the system can be fitted with sensors like; humidity sensor, pH sensor, temperature sensors etc which can provide the user with information about the soil conditions via SMS on his mobile phone.

## *CONCLUSION*

It can be concluded that Photovoltaic systems are designed to supply water and irrigation in areas where there is scarcity of electricity. Their main advantages over hand pumps are their practically zero maintenance, long useful life, no fuel requirement, no contamination, and comparatively easier installation. Also since sun is used as the energy source output coincides with the amount of solar radiation. Thus compared to diesel powered pumping systems, the cost turns out to be 64.2% incase of solarPV pumping system for a duration of 10years. Solar pumps are available to pump from anywhere in the range of up to 200m head and with outputs of u to 250m3/day. Such high is the solar PV water pumping for irrigation (9 to 70 million solar PV pump sets), that at least 255 billion lit/year of diesel can be saved. The Peak demand is around twice the average demand during the irrigation system seasons. Thus this indicates that the solar pumps for irrigation remain under-utilized for most part of the year. The selected irrigation system should be such that it minimizes the water losses without putting additional pressure on the water head.

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