MINI PROJECT-2 (embedded)

TITLE: Grid Tie Rotating Solar Rooftop System.

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REQUIREMENTS

INTRODUCTION:

Increasing Energy demands in the recent years have been seen to be growing at an exponential rate by the commercial and as well as domestic markets. While the non-renewable resources are rapidly getting depleted, it leaves with no other option but to use renewable resources to produce usable energy as well as saving some amount of money .

RESEARCH:

* This project makes this process of harnessing solar energy along with earning some money with it easy.
* With this project you can save money on your power bill, increase the value of your home or office and reduce your carbon footprint without losing the security of the public power grid.

FEATURES:

This project is based on atmega 328P. This controller contols the solar panel by rotating it according to the position of sun.
These energy from the solar panel is then stored in battery which is then used to power the home or office.The remaning energy is then returned to the power station through the gird tie system. Hence with the help of these project lots of Power consumption will be reduced.

4 W'S:

WHO:

Anyone can setup this sytem in their building.

WHEN:

Whenever the person wants to setup this system. (i.e) At anytime and anywhere.

WHY:

To maximize solar energy production and power consumption will be reduced.

WHAT:

The energy from the solar panel is stored in battery which is then used to power the home or office.The remaning energy is then returned to the power station through the gird tie system.

1H:

HOW:

This project is based on atmega 328P. This controller contols the solar panel by rotating it according to the position of sun.
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SWOT ANALYSIS:

STRENGTH:

* Trackers generate more electricity than their stationary counterparts due to increased direct exposure to solar rays. This increase can be as much as 10 to 25% depending on the geographic location of the tracking system.
* Non-use (and disturbance) of land which conserves the local environment.
* Easy to erect and faster deployment.

WEAKNESS:

* High waves and salt water possibly damage the solar panels over time.
* Lack of experience and knowledge.
* This system works only in Warmer climate.

OPPORTUNITIES:

Solar trackers provide significant advantages for renewable energy. With solar tracking, power output can be increased by about 30 to 40 percent. The increase in power output promises to open new markets for solar power.

THREATS:

* Cost concerns and lack of financial resources.
* Maintenance and repair.
* Untested Technology for long run.

HIGH LEVEL REQUIREMENTS:

* The rotating solar system generates more electricity.
* To maimise solar energy production.
* This System can be steup in home or office and can be used for our daily needs.
* A person with proper knowledge about this system only can design this system.

LOW LEVEL REQUIREMENTS:

* Maintenance is high.
* Cost is high.
* It can be used only in warmer climates.

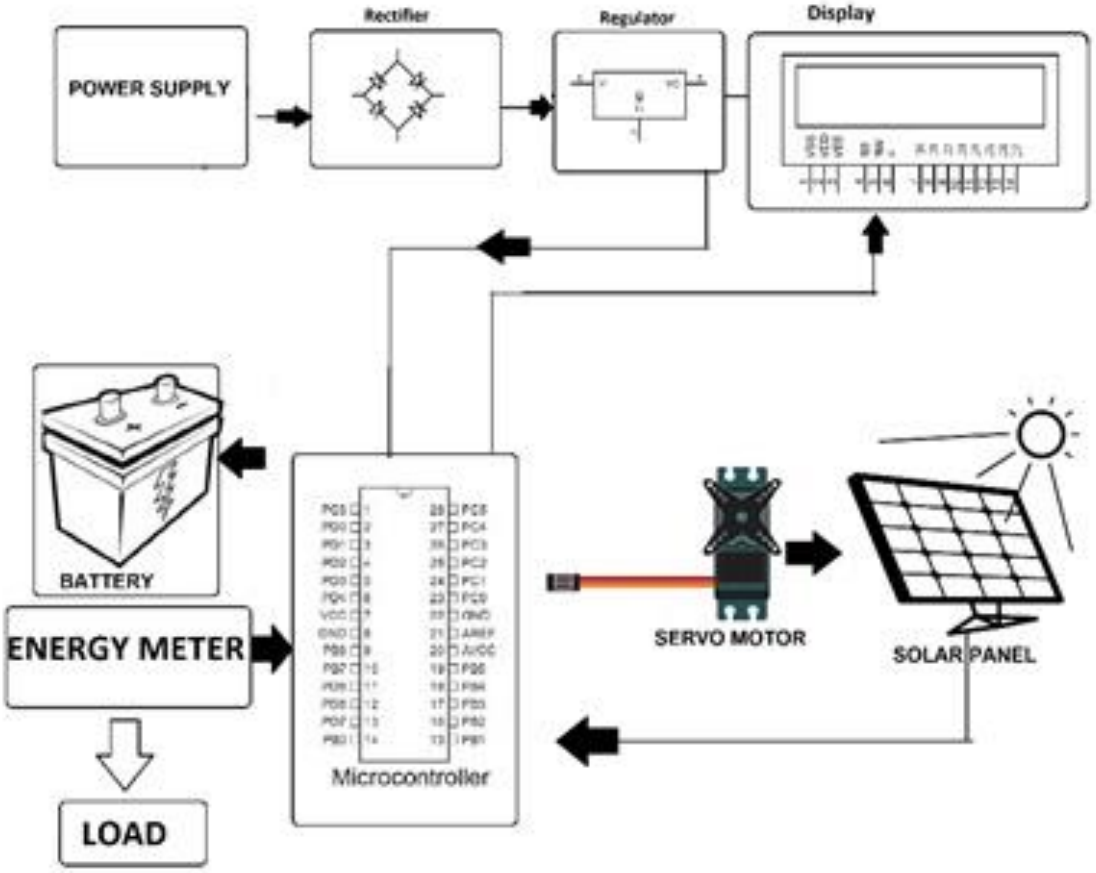
HARDWARE SPECIFICATIONS:

- ATmega328P AVR MC
- Solar Panel
- Servo Motor
- LCD’s
- Crystal Oscillator
- Resistors
- Capacitors
- Transistors
- Cables & Connectors
- Diodes
- PCB
- LED’s
- Transformer/Adapter
- Push Button
- Switch

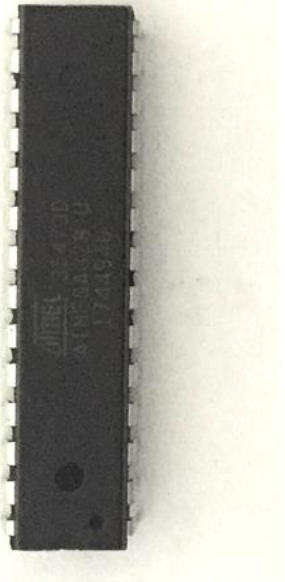
SOFTWARE SPECIFICATIONS:
MPLAB

MC Programming Language: C

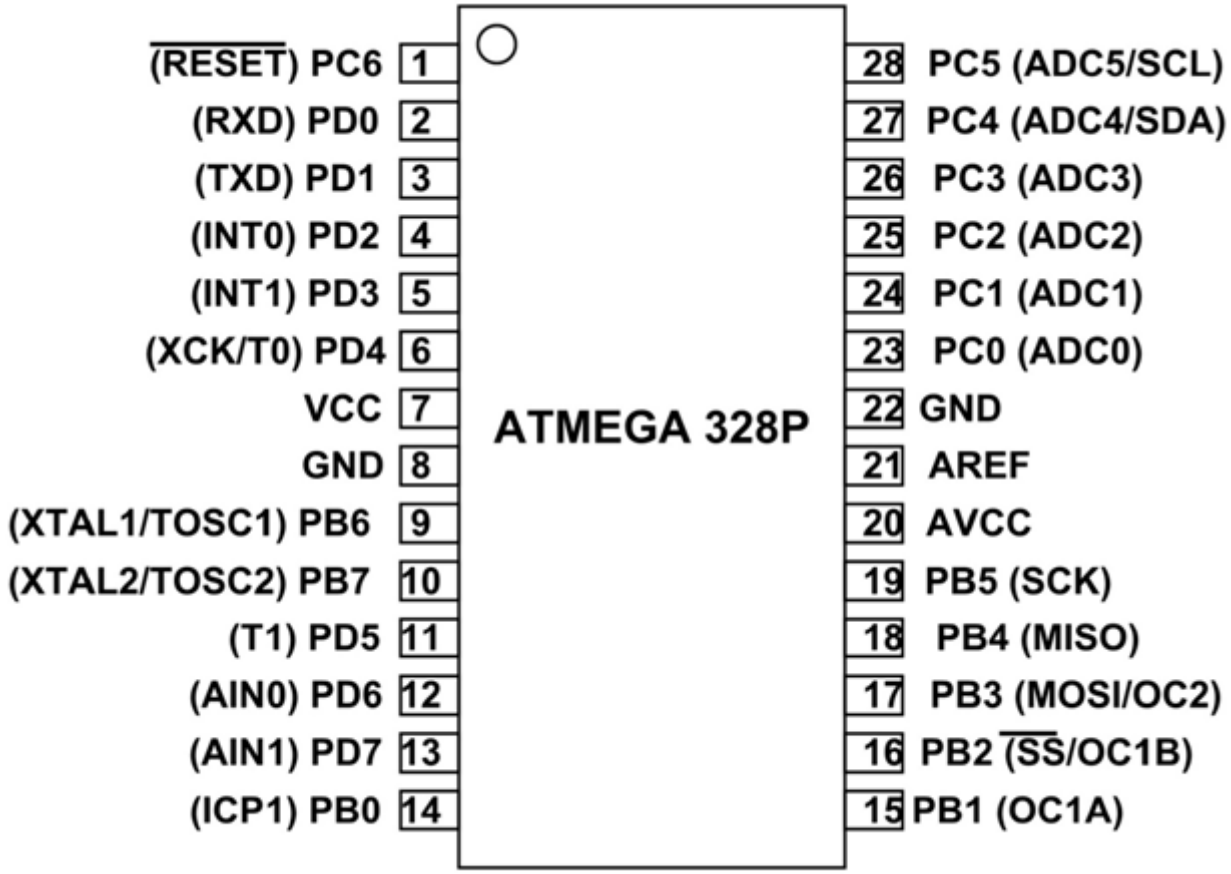
BLOCK DIAGRAM:



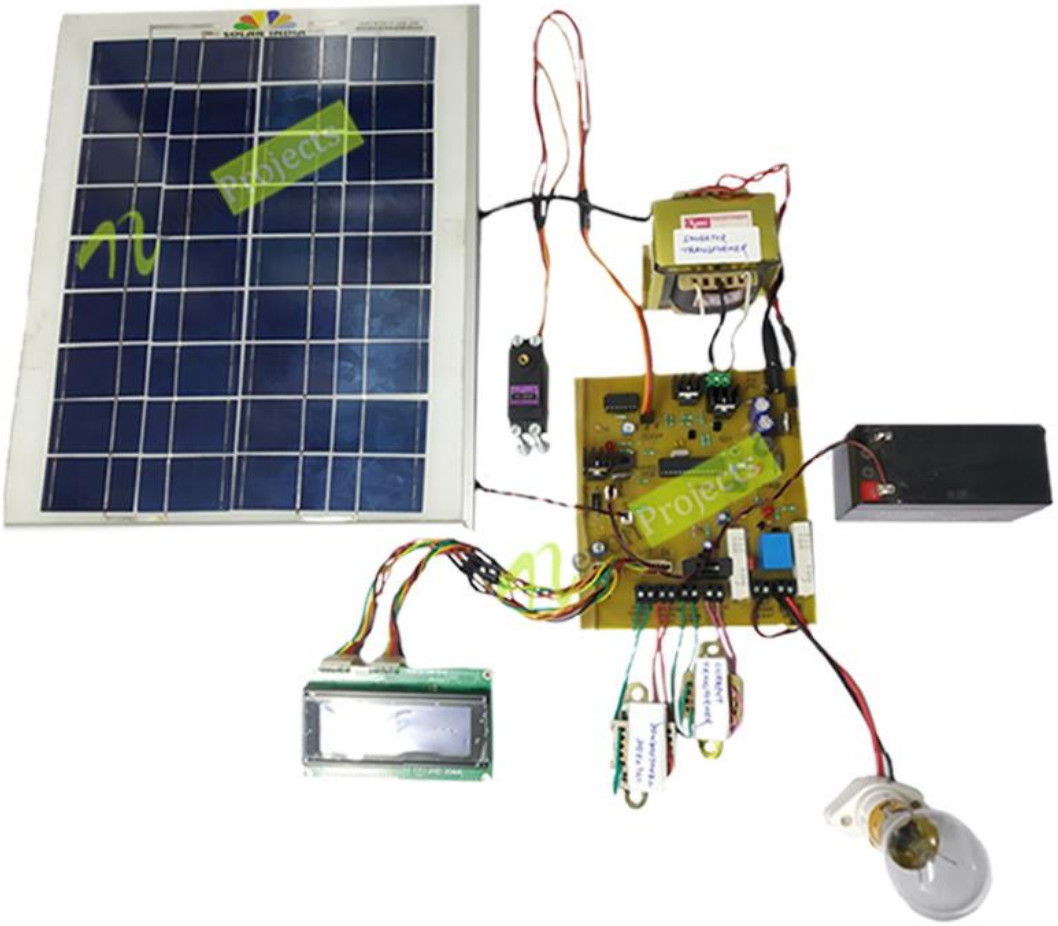
ATMEGA 328P:



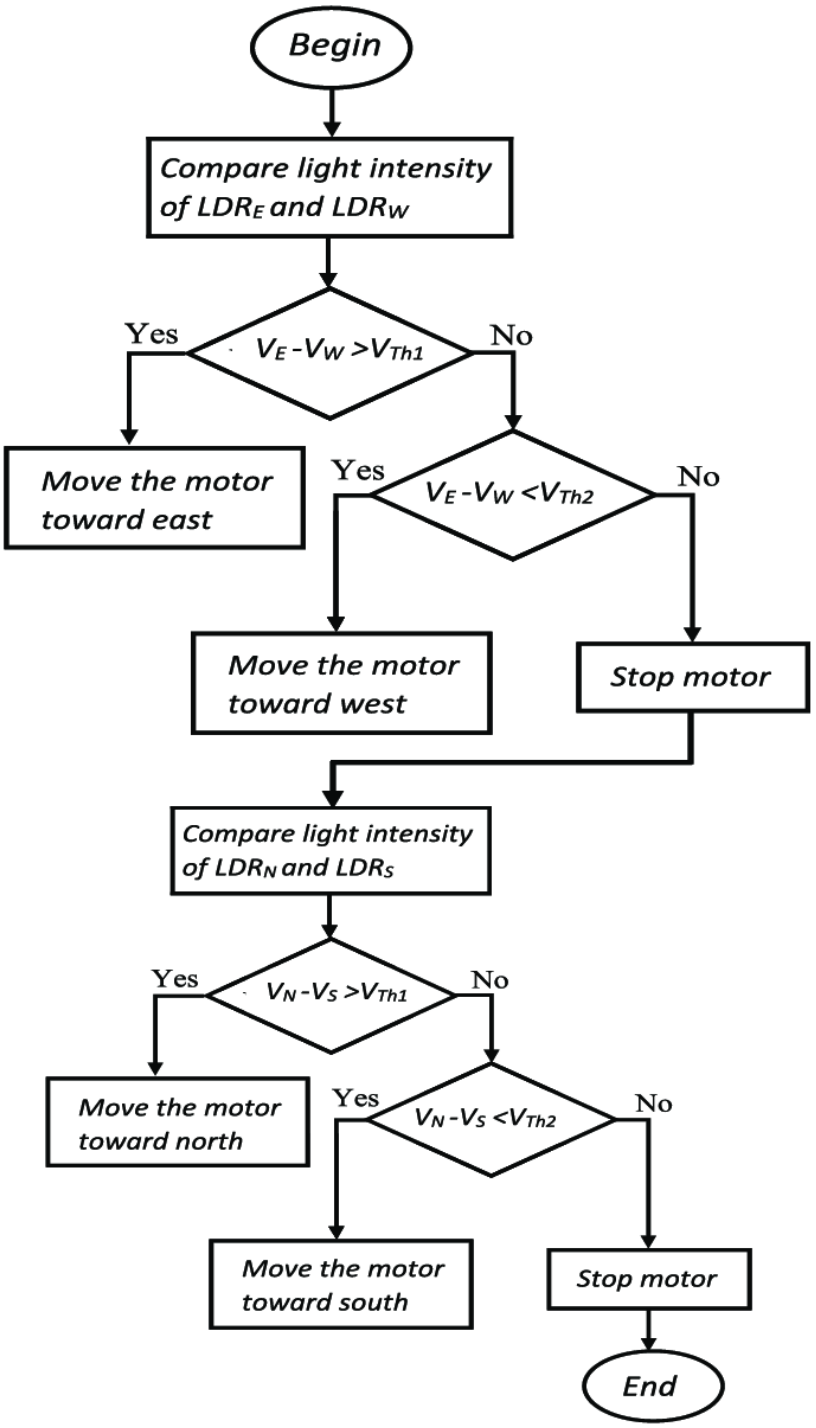
PIN Configuration



HARDWARE SETUP:



Flow Chart:


Begin
Compare light intensity of LDR_E and LDR_W
Yes
$V_E - V_W > V_{Th1}$
No
Move the motor toward east
Yes
$V_E - V_W < V_{Th2}$
No
Move the motor toward west
Stop motor
Compare light intensity of LDR_N and LDR_S
Yes
$V_N - V_S > V_{Th1}$
No
Move the motor toward north
Yes
$V_N - V_S < V_{Th2}$
No
Move the motor toward south
Stop motor
End