

THREE AXIS ROTATING SOLAR TRACKING HYBRID VEHICLE USING PLC& RENEWABLE ENERGY SOURCE

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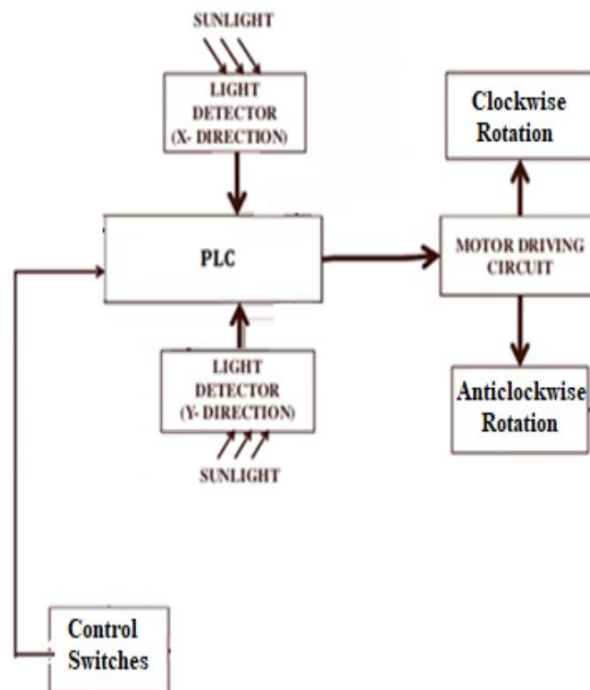
ABSTRACT

A solar car is a solar vehicle used for land transport. Solar cars only run on solar power from the sun. To keep the car running smoothly, the driver must monitor multiple gauges to spot possible problems. Cars without gauges almost always feature wireless telemetry, which allows the drivers team to monitor the cars energy consumption, solar energy capture and other parameters and thereby freeing the driver to concentrate on driving.

Solar cars combine technology typically used in the aerospace, bicycle, alternative energy and automotive industries. The design of a solar vehicle is severely limited by the amount of energy input into the car. Most solar cars have been built for the purpose of solar car races. Some solar cars are designed also for public use List of prototype solar-powered cars. Nowadays there are many conventional solar cars running on the road. Our design is totally different from that car. In our project the solar panel is free to rotate in all directions with it we have attached the PLC with it in which is the programing. By this the solar panel is free to rotate and trace the sun's directions by which the maximum energy of sun will the radiated on the panel and the battery will be fully charged.

II.BLOCK DIAGRAM

Functional Block Diagram



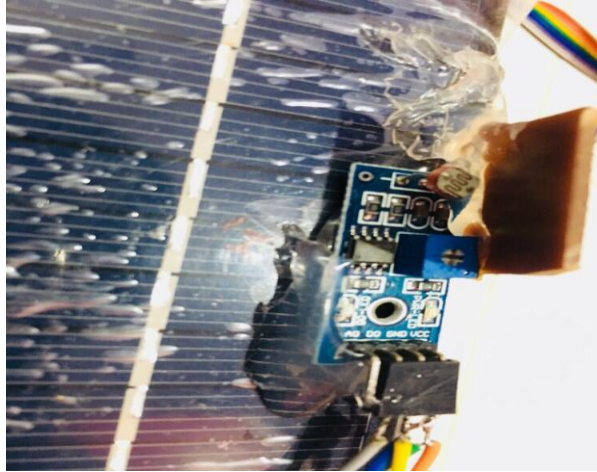
III.COMPONENTS USED

1. REALY



We are used Electro Mechanical- Relay 7AMP/14V DC .A relay electrical signal form the PLC, and passes them to the output part such as a motor .

2. LDR SENSORS



We are used Two LDR (light-dependant resistor) modules sensors is a light controlled variable resistor. They sense the higher density area of sun light. The solar panel moves to the high light density area though servo motor.

3. SERVOMOTORS



We are used DC Servomotor is actually an assembly of four things : a normal DC motor, a gear reduction unit , a position-sensing devices (usually a potentiometer), and control circuit. The function of the servo motor is to receives a control signal that represents a desired output. The solar panel that attached to motor will be reacted to the direction of the motor.

4. SOLAR PANEL



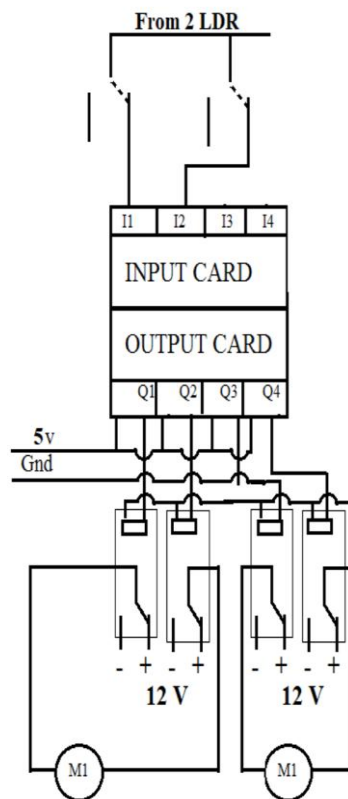
In our project used Mini solar photovoltaic panel Feature: 12V 2W solar panel of current: 0-200mA
Size: 140*115mm. the solar panel converts sunlight into DC electrical charge the battery. As figure shows that 2 LDR's sensors mounted on solar panel. And the outputs are connected to panel through plc and relay card.

5 PLC (programmable logic controller)



PLC (Programmable logic controller) needs 24v supply for its operation. We are referred new LOGO! Siemens plc of version 8. It having 4 no's of input and output. By using plc our project is fully automation. We are feed program ladder diagram though logo software.

IV.CIRCUIT DIAGRAM



WORKING

In this project we are going to replace the normal conventional solar car by the rotating solar panel car. We are designing a new type of car in which the shape of the car is changed. We are using a parabola in which the solar plate will be free to rotate in all directions. By doing so we are concentrating 100% energy of the sun on the panel due to which the battery of the car will be totally charged and can be used for maximum of 5 hours. In this we are installing a PLC which will be fully programmed from the car manufacturing company. We are giving two LDR sensors on the solar plate above the car which will sense the sunlight and work accordingly and the plate will rotate in the direction of sun. There are two motors used for our construction which allows the system to do that work properly. We are controlling our car by remote control because the PLC needs 24V supply and other components also need some supply so energy will not be generated by a 12V plate. In original car the power generated is very high so all the needs are been fulfilled. By doing this project we are giving the customer a car which is pollution free and also their fuel cost is reduced. The efficiency of this car is more than the conventional solar car. The PLC we are using in our project is 24V Siemens LOGO PLC which is very efficient for our project. We are taking the solar car to another extent by doing this we are giving the nation pollution free car. **COST**

CONCERN:-

Sr. no.	Parameter	Quantity	Cost

1	PLC(Siemens Logo)	1	
2	SMPS 24V	1	
3	PV Plate 12V	1	
4	Relay 24V	1	
5	LDR Modules	2	
6	Transformer 9V	2	
7	Motor 10 RPM Geared	3	

ADVANTAGES:-

1. Savings of fossil fuels
2. Saving of fuel cost
3. Maximum solar energy consumed
4. Maximum energy stored in battery
5. Hybrid technology
6. Efficiency of car improved
7. Less maintenance required

APPLICATIONS:-

- 1) Applicable in areas with high sun energy or heat.
- 2) In area where pollution is to be reduced.
- 3) Wide used in village areas where petrol pumps are easily available.

FUTURE SCOPE:-

We can interface SCADA system for more energy options from solar.

When the car will be parked then too the system will work and produce energy which can be used for other applications.

This system can be used in other various vehicles such as cranes, trucks, ambulance etc

REFERENCE

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