

Solar Tracking System

By Sunil Kumar

August 12, 2016

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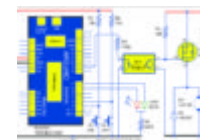


Generally, solar panels are stationary and do not follow the movement of the sun. Here is a solar tracker system that tracks the sun's movement across the sky and tries to maintain the solar panel perpendicular to the sun's rays, ensuring that the maximum amount of sunlight is incident on the panel throughout the day. The solar tracking system starts following the sun right from dawn, throughout the day till evening, and starts all over again from the dawn next day.

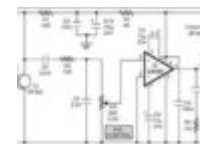


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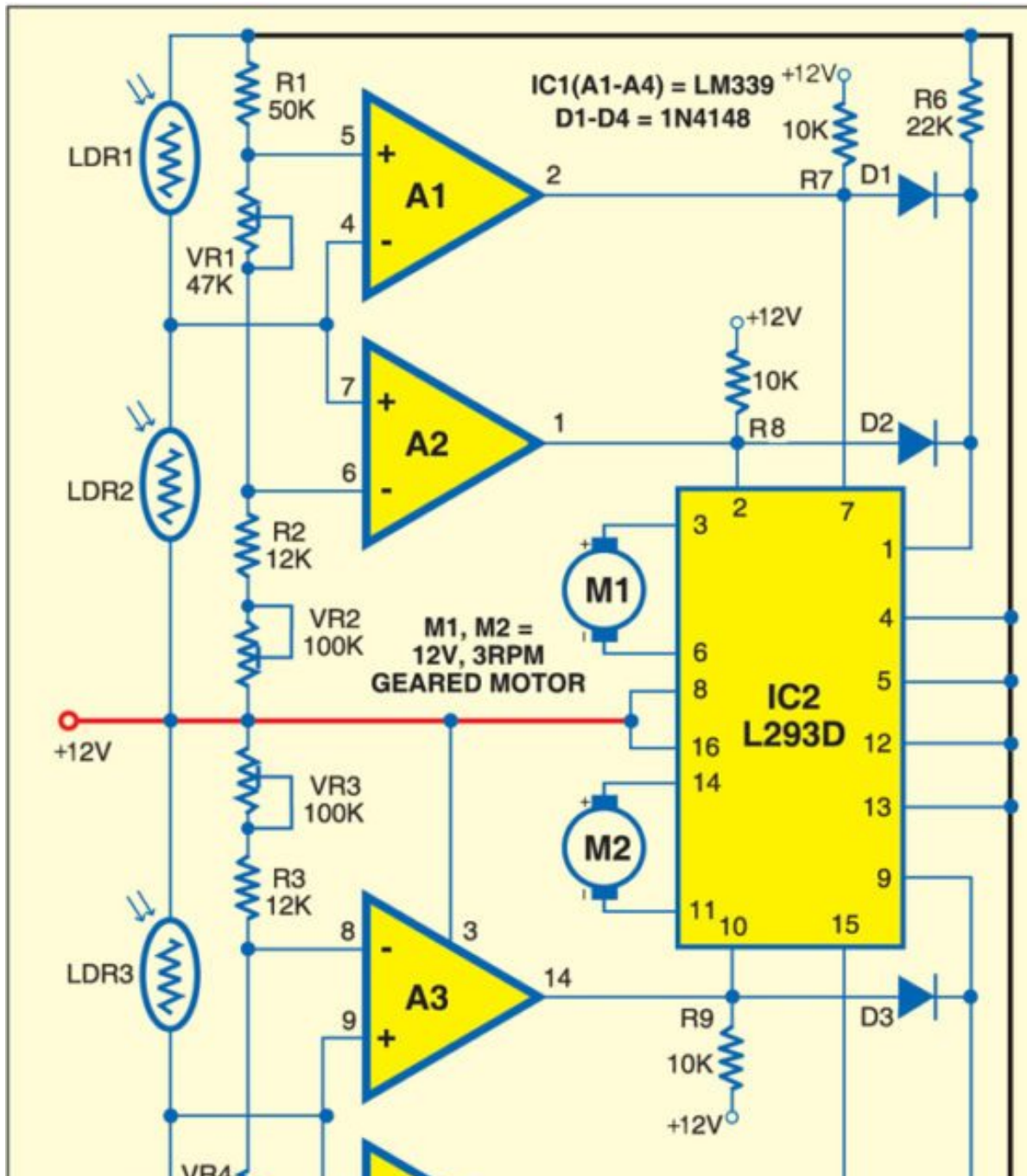
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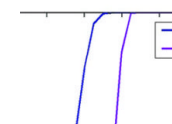
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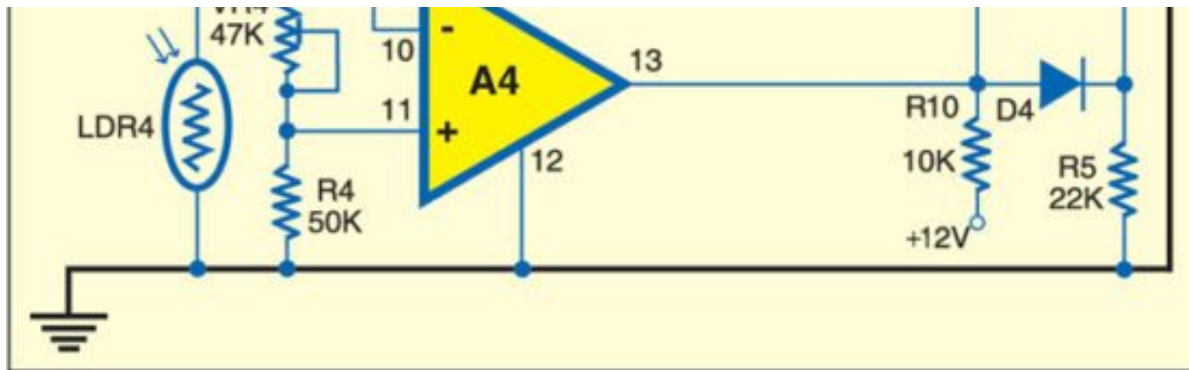
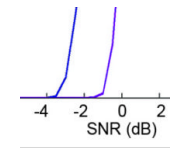


Fig. 1: Circuit of solar tracking system

Fig. 1 shows the circuit of the solar tracking system. The solar tracker comprises comparator IC **LM339**, H-bridge motor driver IC **L293D** (IC2) and a few discrete components. Light-dependent resistors LDR1 through LDR4 are used as sensors to detect the panel's position relative to the sun. These provide the signal to motor driver IC2 to move the solar panel in the sun's direction. LDR1 and LDR2 are fixed at the edges of the solar panel along the X axis, and connected to comparators A1 and A2, respectively. Presets VR1 and VR2 are set to get low comparator output at pins 2 and 1 of comparators A1 and A2, respectively, so as to stop motor M1 when the sun's rays are perpendicular to the solar panel.

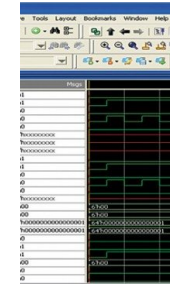
Circuit operation

When LDR2 receives more light than LDR1, it offers lower resistance than LDR1,



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providing a high input to comparators A1 and A2 at pins 4 and 7, respectively. As a result, output pin 1 of comparator A2 goes high to rotate motor M1 in one direction (say, anti-clockwise) and turn the solar

panel.

When LDR1 receives more light than LDR2, it offers lower resistance than LDR2, giving a low input to comparators A1 and A2 at pins 4 and 7, respectively. As the voltage at pin 5 of comparator A1 is now higher than the voltage at its pin 4, its output pin 2 goes high. As a result, motor M1 rotates in the opposite direction (say, clock-wise) and the solar panel turns.

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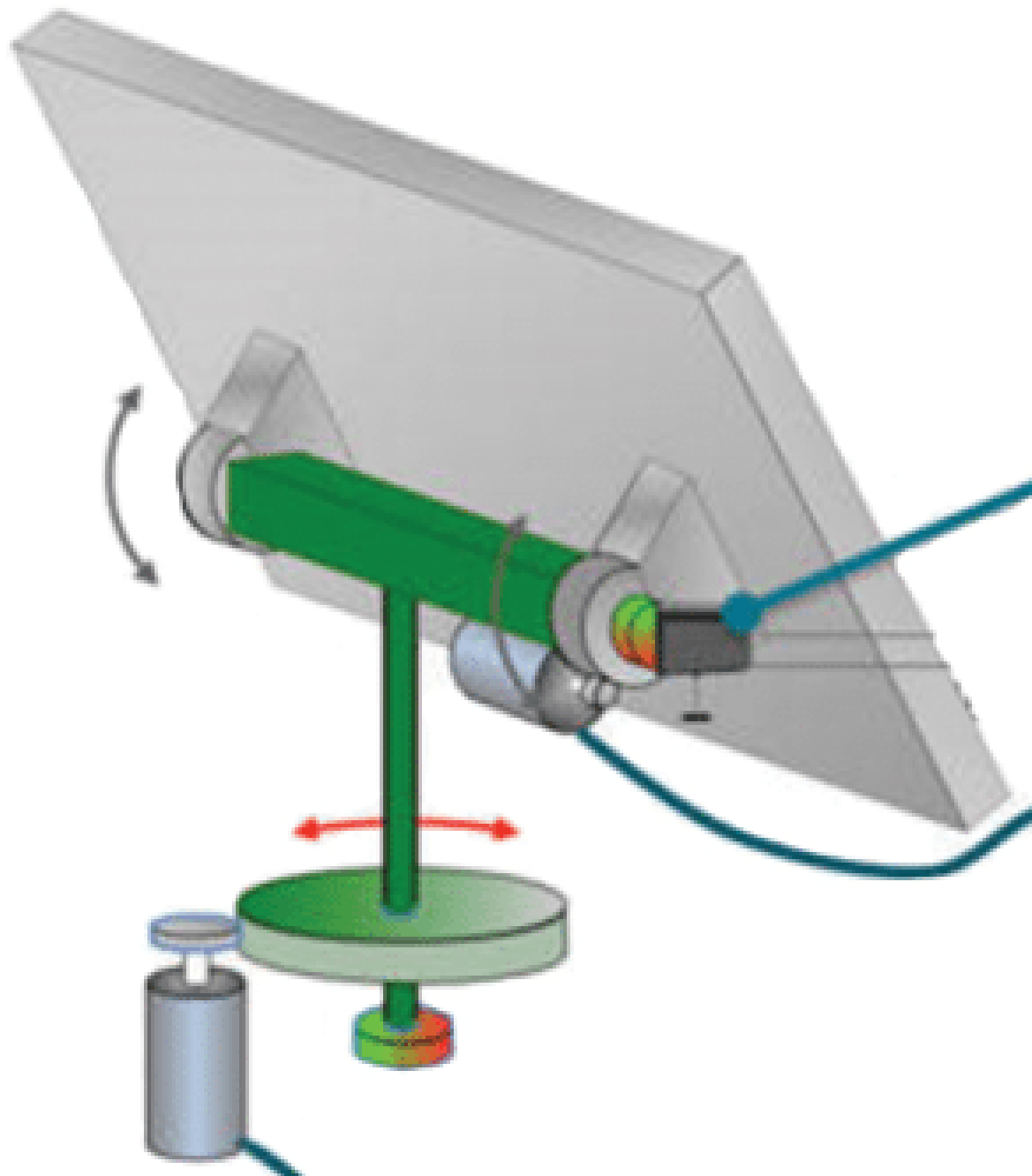


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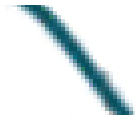


Fig. 2 Proposed assembly for the solar tracking system

Similarly, LDR3 and LDR4 track the sun along Y axis. Fig. 2 shows the proposed assembly for the solar tracking system.

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11 COMMENTS



UTTAM August 17, 2016 at 5:22 pm

WHAT SHOULD BE THE RATING OF LDR

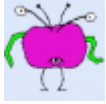
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SHAMSUDHEEN MARAKKAR August 16, 2017 at 7:56 pm



LDR is cheap, it costs 2 to 5 rupeer.

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manuel arieira February 27, 2017 at 4:59 pm

desejava o desenho do circuito impresso para este seguidor solar

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EFY Team March 6, 2017 at 10:36 am

Desculpe, atualmente não temos o layout impresso para este circuito em particular, pois é apenas um protótipo.

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ankur March 23, 2017 at 12:31 pm

where did solar panel connect . clear connection can u plz send to me

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Pakshal October 25, 2017 at 10:28 pm

What are VR1 and VR2 and VR3 and VR4? i have used 9V motor and 9V battery, do i need to change the resistances?

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Soumya November 9, 2017 at 3:39 pm

Did the circuit worked?

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efylab November 28, 2017 at 3:57 pm

VR1, VR2, VR3 and VR4 are variable resistors or presets.

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satyam October 25, 2017 at 10:39 pm

what are vr1,vr2,vr3 and vr4?

what are the significances of vr1 in the circuit?

if we are using 9v battery and motor then do we need to change the value of the resistances?

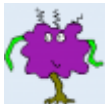
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efylab November 28, 2017 at 4:08 pm

They are variable resistors. VR1 is used to set the voltage at output pin2 of comparator (A1). You may use 9V battery as power supply but in that case the output level at each comparator output will be different. And also you need to recalibrate the resistances at the input of each comparator.

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Daniel Davidson November 7, 2017 at 2:03 am

How is it that data sheet for L293 shows VCC1 must be less than 7v

This circuit will destroy L293

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