SUNO - The self-oriented Solar Mirror

An EPS@ISEP project

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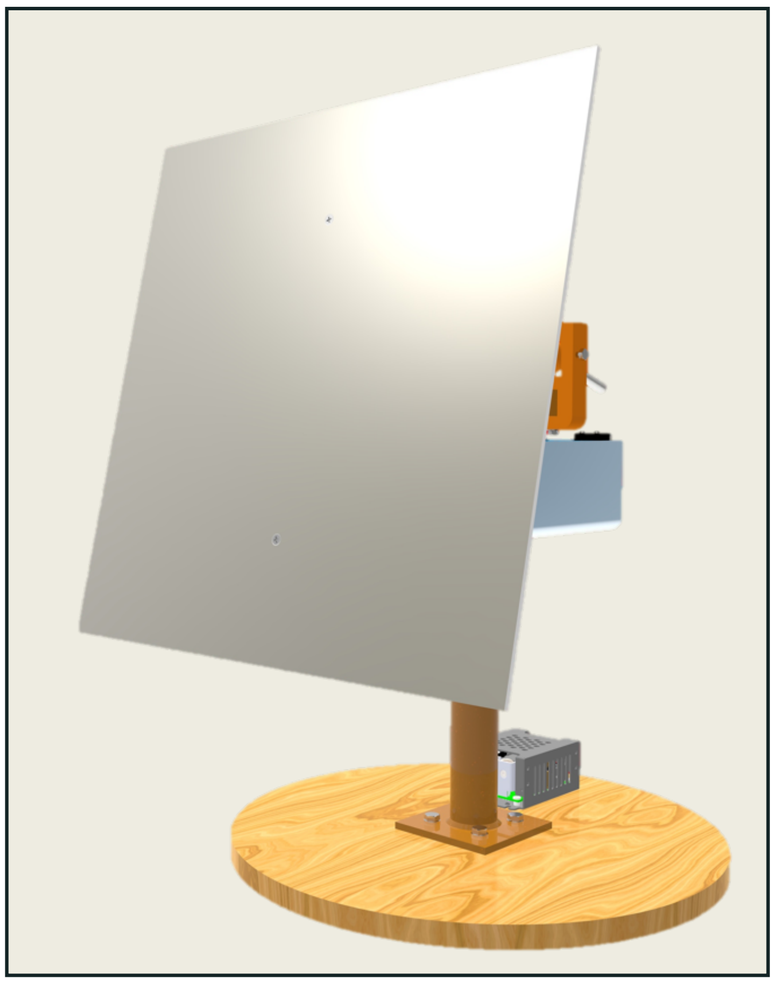
What is the solar mirror?

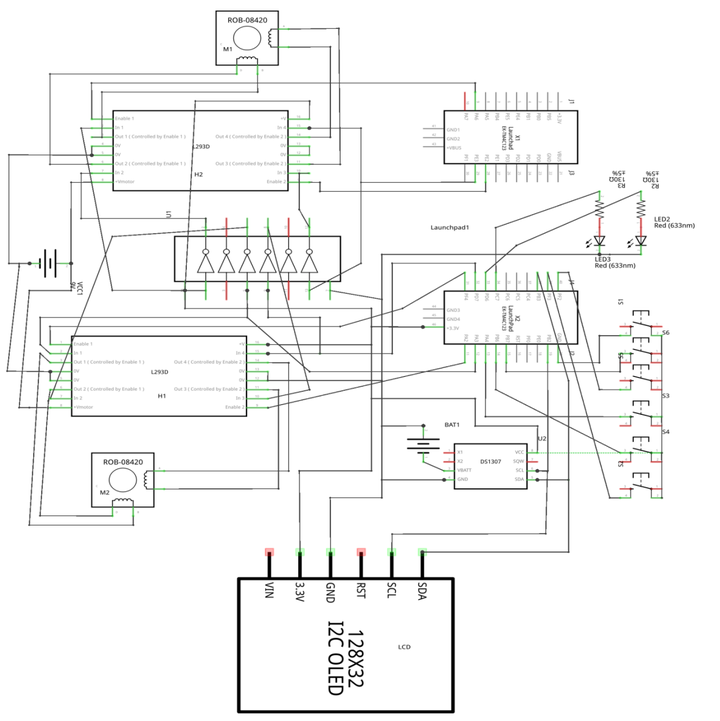
The solar mirror is a simple way to harness solar energy and to transform it into energy that can be used daily. Raw materials are overused and new sources of energy are needed.



Goal

- Make a self oriented solar mirror
- Mirror must track the movement of the Sun and
- Mirror must reflect the sunlight onto a predefined area
- Make the product costumer friendly

Schematics

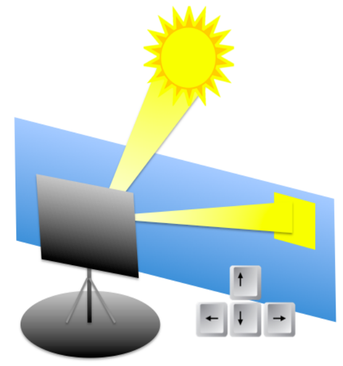


Manual

1. Place the mirror in a sunny place facing the south

2. Turn the mirror on

3. Move to the focus point using the buttons



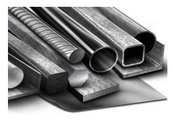
SUNO

Materials

Polyvinyl Chloride (PVC) [2]

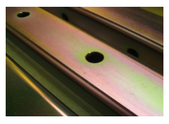
Medium Density Fiberboard (MDF) [3]

Pine Tree [4]



Steel [5]

Aluminum [6]



Zinc Plated Metal [7]

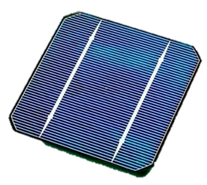
Components

Bipolar stepper motor [8]

- The good resolution allows precise movement and easy control
- High torque and a holding torque without power supply

Power supply

Solar Panel (Final product) [9]



- The product is supposed to work only during the day and changes its position towards the Sun.
- The system will hibernate when the Sun is out of range, which will minimize the power consumption.

An external power supply (Prototype)

- Ideal because two different voltages are needed
- Supplies 12 volt for the motor and 5 volt for the Arduino board

LCD display (Final product) [10]

- Has to support SPI or I2C protocol to minimize number of pins used

RTC

- To keep track of time, to know the position of the sun, the exact time has to be known
- It has to have its own battery and it has to support the I2C protocol.

Tiva C [11]

- Inexpensive, self-contained, single-board microcontroller

Others

- LEDs and buttons (5 and on/off switch)
- Some additional resistors might be needed for the buttons as a pull down and capacitors for debounce.

The team

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References

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