

ATMEGA 328SOLAR TRACKING CLOSED LOOP SYSTEM FOR POWER POWER FACTOR IMPROVEMENT.

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Abstract:

The principal objective of this undertaking is to give continuous power supply to a heap by consequently choosing ideal power from any of the 4 distinct sources, for example, sun oriented, mains, generator and inverter to supply guarantee coherence in the power.

In this venture, four switches are utilized instead of four unique wellsprings of force supply. Whenever any of the switches is squeezed it shows the shortfall of that specific source. These switches are associated as information signs to the microcontroller. The result of the microcontroller is given to a transfer driver IC that changes proper hand-off to keep a continuous inventory to the heap.

The result is seen by utilizing a light drawing power supply from the mains, at first for all the four sources. On the disappointment of the mains supply (which is incited by squeezing the suitable switch), the heap gets supply from the following accessible source, for example, an inverter. On the off chance that the inverter likewise fizzles, it switches over to the following accessible source, etc. The ongoing status, with regards to which source supplies to the heap is likewise shown on the LCD. As it isn't attainable to give each of the 4 distinct causes of supply, one source with substitute switches are given to get a similar capacity. Anyway assuming 4 sources are accessible it very well may be changed to take power from them.

This venture can be additionally improved by utilizing different sources like breeze power, and afterward takes into thought the most ideal power source whose levy stays least at that point.

Aim of The Project :-

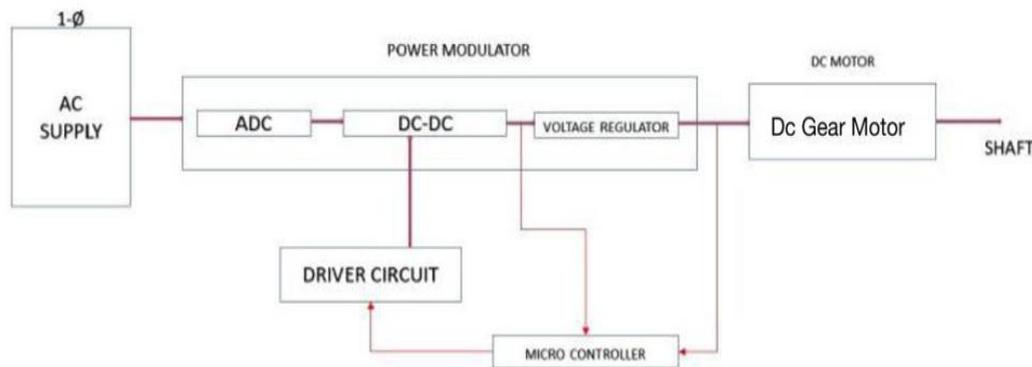
In distant regions the sun is a modest wellspring of power on the grounds that rather than water driven generators it utilizes sun based cells to create power. While the result of sun based cells relies upon the power of daylight and the point of frequency. It means to get greatest productivity; the sun oriented panels¹ should stay before sun during the entire day. In any case, because of revolution of earth those boards can't keep up with their position generally before sun. This issue brings about lessening of their productivity. Consequently to get a consistent result, a robotized framework is required which ought to be skilled to turn the sunlight powered charger continually. The Automatic Sun Tracking System (ASTS) was made as a model to tackle the issue, referenced previously. It is totally programmed and keeps the board before sun until that is apparent. The remarkable element of this framework is that as opposed to accepting the earth as its reference, it accepts the sun as a directing source. Its dynamic sensors continually screen the daylight and turn the board towards the bearing where the force of daylight is greatest. In the event that the sun gets imperceptible for example in overcast climate, then, at that point, without following the sun the ASTS continues to pivot the sunlight powered charger in inverse heading to the turn of earth. Yet, its speed of pivot is same as that of earth's rotation². Because of this property when after some time for example thirty minutes when the sun again gets noticeable, the sunlight based charger is by and large before sun.

Power factor and its importance

It is known that the effectiveness of the sun oriented PV module is low in this way, it is attractive to work the module at the pinnacle power point to amplify the conveyed capacity to the heap under differing temperature and sunlight based radiation

conditions. Consequently, amplification of force works on the use of the sun based PV module. The dc converter effectively transfers most extreme power from the PV module to the heap by changing the obligation cycle. The heap impedance as seen by the source is shifted and coordinated at the place of the pinnacle power with the source. Along these lines, the most extreme power is moved. The accessible dc converters are venture down converter, move forward converter and move forward advance down converter. In the buck converter is chosen to utilize a battery with low voltage to give power congruity at the day night. The converter is utilized to decrease input voltage when the result requires a lower voltage. It comprises of a power switch that is trailed by an inductor, a diode and result capacitance.

BLOCK DIAGRAM



Major components :-

1.Regulated Power Supply

Every embedded device requires dc voltage and that to be able to be 5v deliver We have become 230v, 50 Hz in our family applications. We can be used to function the house appliances like T.V, cooler, fan, light's Digital electronic gadgets need virtual supply and we are able to get deliver from regulated strength supply block.

2.SOLAR PANEL

The sun based cells that you see on mini-computers and satellites are likewise called photovoltaic (PV) cells, which as the name suggests (photograph signifying "light" and voltaic signifying "power"), convert daylight straightforwardly into power. A module is a gathering of cells associated electrically and bundled into a casing (all the more ordinarily known as a sun powered charger), which can then be assembled into bigger sunlight based clusters.

Photovoltaic cells are made of unique materials called semiconductors, for example, silicon, which is right now utilized most regularly. Fundamentally, when light strikes the cell, a specific piece of it is assimilated inside the semiconductor material. This implies that the energy of the retained light is moved to the semiconductor. The energy thumps electrons free, permitting them to unreservedly stream.

3.DC Gear Motor

Equipped DC engines can be characterized as an augmentation of DC engine which previously had its Insight subtleties demystified here. An outfitted DC Motor has a stuff gathering joined to the engine. The speed of engine is included as far as pivots of the shaft each moment and is named as RPM .The stuff gathering helps in expanding the force and lessening the speed. Involving the right mix of pinion wheels in a stuff engine, its speed can be diminished to any helpful figure. This idea where pinion wheels decrease the speed of the vehicle yet increment its force is known as stuff decrease. This Insight will

investigate every one of the minor and significant subtleties that make the stuff head and subsequently the working of outfitted DC engine.

4. Micro Controller

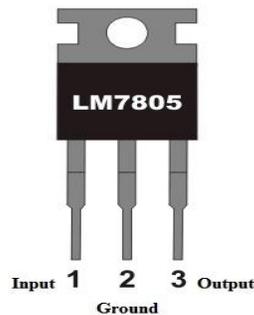
The ATmega328 is an Advanced Virtual RISC (AVR) microcontroller. It upholds 8-bit information handling. ATmega-328 has 32KB inside streak memory.

ATmega328 has 1KB Electrically Erasable Programmable Read-Only Memory (EEPROM). This property shows on the off chance that the electric stock provided to the miniature regulator is taken out, even it can store the information and can furnish results subsequent to furnishing it with the electric inventory. Besides, ATmega-328 has 2KB Static Random Access Memory (SRAM). Different qualities will be made sense of later. ATmega 328 has a few unique highlights which make it the most well known gadget in the present market. These highlights comprise of cutting edge RISC engineering, great execution, low power utilization, genuine clock counter having separate oscillator, 6 PWM pins, programmable Serial USART, programming lock for programming security, throughput up to 20 MIPS and so on. Further insights concerning ATmega 328 will be given later in this segment.



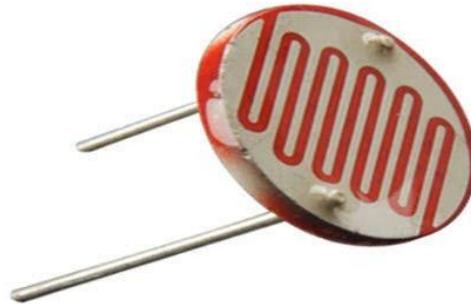
5. Voltage Regulator

A voltage controller (additionally called a 'controller') with just three terminals has all the earmarks of being a traight forward gadget, however it is as a matter of fact an exceptionally perplexing coordinated circuit. It changes over a shifting information voltage into a consistent 'controlled' yield voltage. Voltage Regulators are accessible in an assortment of results like 5V, 6V, 9V, 12V and 15V. The LM7805 series of voltage controllers are intended for positive information. For applications requiring negative info, the LM7805 series is utilized. Utilizing a couple of 'voltage divider' resistors can build the result voltage of a controller circuit.



6. LDR Sensor

The LDR Sensor Module is utilized to identify the presence of light/estimating the power of light. The result of the module goes high within the sight of light and it turns out to be low without light. The awareness of the sign location can be changed utilizing potentiometer.



7.L293D

L293D is a double H-bridge engine driver coordinated circuit (IC). Engine drivers go about as ebb and flow intensifiers since they take a low-momentum control signal and give a higher-momentum signal. This higher current sign is utilized to drive the engines.

L293D contains two inbuilt H-bridge driver circuits. In its not unexpected method of activity, two DC engines can be driven at the same time, both in forward and switch bearing. The engine activities of two engines can be constrained by input rationale at pins 2 and 7 and 10 and 15. Input rationale 00 or 11 will stop the relating engine. Rationale 01 and 10 will turn it in clockwise and anticlockwise bearings, separately.

8.Oscillator

An digital oscillator is an electronic circuit that produces a repetitive Electronic sign, frequently a sine wave or a rectangular wave. PIC micro controller internally having 4mhz clock frequency. We are giving the 16Mhz clock frequency as an outside source for growing the device performance.



9.LED Indicators

LED (Light Emitting Diode) is a semiconductor mild source used as an indicator. In the challenge, LED signs are used to show the Microcontroller health Status and indications for numerous operations LED s used in the undertaking works with 2V, 10Ma

WORKING :

The schematic chart makes sense of the communicating portion of each and every part with miniature regulator, The precious stone oscillator is associated with ninth and tenth of the microcontroller ATmega 328.

The capacitor is associated with the gem oscillators in equal. The pin seventh is associated with the voltage controller of 5v. Coming to the pin 1, it is associated with the 10k ohm resistor and pin eighth is grounded.

The pin seventeenth is associated with the DC Gear Motor to pivot the sunlight powered charger. Crafted by the DC Motor is to pivot the sun powered charger. The pin twentieth and 21st is associated with the 5v Dc Regulator.

Pin 22nd is grounded.

The LDR Sensors are associated with 10k ohm resistor is associated with 27th. What's more, one more LDR is associated with pin 28th of ATmega328.

The ' daylight following sensor' is introduced on the sun oriented gadget, and as per the place of the sun, the engine is headed to the mechanical revolution to continuously follow the sun's situation. At the point when the sun redirects by a certain point ,the regulator gives a guidance, the pivoting instrument turns for a couple of moments, and stops when it arrives at the place of the sun, sitting tight for the following sun diversion and continues to move like this. Stop the activity when the sun is shady or around evening time.

Advantages

- 1.Solar energy is liberated from contamination.
- 2.The plant requires little support or help after arrangement.
- 3.It is affordable.
- 4.When it is associated with the lattice, sun based energy can surpass the greatest expense power at top interest and can likewise lessen framework stacking, aside from disposing of the requirement for nearby battery power in dimness.

Applications

- 1.Can be used to all loads to improve the power factor.
- 2.Can be used in commercial and residential loads
3. It can be majorly used in street lights

CONCLUSION

In spite of the fact that ASTS is a model towards a genuine framework, yet at the same time its product and equipment can be utilized to drive a genuine and exceptionally tremendous sunlight based charger. A little compact battery can drive its control hardware. In this manner simply by supplanting the detecting instrument, its calculation and control framework can be utilized in RADAR and moveable Dish Antennas

REFERENCES

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