A HYBRID MODE OF SE BASED AGROSPRAYER

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Abstract—*The principle target of the paper is to robotize the pesticide splashing in fields. Here the sprayer is exchanged by a transfer framework which is controlled by the microcontroller. The boos convertor circuits increments or boos up the voltages got from the sunlight based boards and the fuel cells. The power is then put away in the battery and utilized by the system .Renewable vitality assumes a critical part in our future .due to it is accessible bottomless in nature and furthermore it is sans contamination. The term sun based vitality is characterize as the way toward collecting of sun oriented vitality by photograph voltaic cell [1][5].Solar cell is the silicon semiconductor which is utilized to trap of the sun based vitality. Here we incorporate the another economic vitality that is power module .it is the way toward changing over of the substance vitality to electrical vitality. A power device is a gadget that utilizations hydrogen (or hydrogen rich fuel) and oxygen to make vitality by electrochemical process[7][4].Here impetus utilized is to accelerate the dissemination of particles in the energy component utilized over her*

Keywords—Solar Panel, DC Pump, Microcontroller, Sprayer, Fuel cell, battery

1. INTRODUCTION

In India at rate of (2013-2015) there are 159.9 million hectare of agrarian land .in our taking after venture we will show about an item for mix for two SE vitality based agro sprayer.[1] The blend of two SE one is (sun based and power device) these vitality are synchronized by dc transport bar . at that point the charge from the power device and sun powered are put away in the battery [3] . This framework can be utilized as a part of every single climate condition .likewise can be executed in pesticide sprayer and paint sprayer and so forth As per the hypothetical qualities streams and charging time correlation the season of charging a 12V 7A battery take full charge time of around 5-6h. The completely charged battery can splash of 200 litters of pesticide fluid approx 2-3 sections of land of horticultural land [1]. it's underlying expense is more contrast with the current framework yet the running expense is little contrasted with the current framework

The ordinary sprayer having the challenges, for example, it needs parcel of push to push the liver here and there keeping in mind the end goal to make the weight to splash. Another trouble of petrol sprayer is to need to buy the fuel which builds the running expense of the sprayer. With a specific end goal to beat these troubles, we have proposed a Multiple Power provided Fertilizer Sprayer [1]. This can be worked utilizing SE amid the nearness of sun, else it can be worked utilizing the power supply. The primary points of interest of the introduced framework are the running cost lessens to least and furthermore efficient.

2. EXISTING SYSTEM

A.Hand Pump Framework

Here the individual who are conveying the pesticide sprayer which is pumped by the individual who are conveying that. Pesticide fluid which is from the tank streams with the assistance of the pumping physically by the individual . here the outlet of the weight chamber is associated with the sprayer . This kind of sprayer which can weight most extreme upto 3 bar it might conceivable of stream of fluid more than a required sum in a specific range . builds the need of the pesticide fluid It infers of colossal measure of human work and troublesome for splashing enormous zones,expend part of time in it.

B. Fuel Worked Framework

Here with the assistance of petrol motor it has of the drive of up to 50 meter of length splash .With the assistance of the weight made by the petrol motor reasons for gigantic wind current .Side by side they will attack of the fluid stream tube where the pesticide fluid stream with the assistance of enormous stream of gaseous tension the fluid is showered in general the documented This framework which reason for immense measure of clamor contamination and required measure of fuel might be increments .To over happen to these things the accompanying procedure can be suggested.

3. BLOCK DIAGRAM

The accompanying square outline says in regards to the three units principally are:

1)energy collecting terms 2)energy capacity frameworks 3)energy usage framework 4)regulating framework

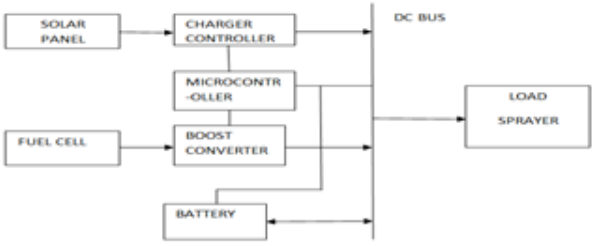

Fig 1. Block Diagram

This sorts of framework said in regards to the procedure of vitality preparing and how it is utilized over the framework utilized as a part of this sprayer. This sort 1'st gathering terms are ;pv panels,fuel cells.2'nd terms; stockpiling are battery.3'rd usage are load to be utilized 4'th are sunlight based charger control and so forth...
The units are talked about as takes after:

The vitality preservation should be possible through the sun based vitality and direct current mode .the sun oriented board which creates the force of (13v*3A=39w approx) .
Energy component in the process which produces of power(3V*0.5A=1.5w approx) in a solitary energy component here we will consolidate more than one (ie ..3 energy unit)
Here DC transport bar is utilized because of the parallel synchronization for the two reasonable vitality sources .In parallel synchronization the voltage between the two sources are stay consistent (ie..12v) and the current between the two source are included. These terms are utilized charging of the battery. the sun oriented charger controller is utilized for the controlling of force stream frame pv board .
The procedure of he microcontroller is utilized to the control of the vitality control process are atomized utilizing of atmega8 microcontroller it has 28 stick design points of interest as follows in the theme of circuit chart.

A. Photovoltaic Cell

Change of light vitality in electrical vitality depends on a wonder called photovoltaic
impact. At the point when semiconductor materials are presented to light, the a portion of the photons of light beam are consumed by the semiconductor precious stone which causes noteworthy number of free electrons in the gem. This is the fundamental reason of creating power because of photovoltaic impact. Photovoltaic cell is the fundamental unit of the framework where photovoltaic impact is used to create power from light vitality. Silicon is the most generally utilized semiconductor material for building photovoltaic cell. The silicon molecule has four valence electrons. In a strong gem, every silicon particle shares each of its four valence electrons with another closest silicon molecule subsequently making covalent bond between them. Thusly silicon precious stone gets a tetrahedral cross section structure. While light beam strikes on any materials some segment of light is mirrored, some part is transmitted through the materials and rest is consumed by the materials .The pv board have two areas are n-locale and p-district like diode.

Fig 2. Solar Array

All things considered light created openings are moved to p-district where they are caught on the grounds that once they go to the p-locale can't have the capacity to return to n-sort area because of shock of potential boundary. As the negative charge (light created electrons) is caught in one side and positive charge (light produced openings) is caught in inverse side of a cell there will be a potential contrast between these two sides of the cell. This potential contrast is regularly 0.5 V. This is the means by which a photovoltaic cells or sun oriented cells deliver potential distinction.

B. Fuel Cell

A power module is a gadget that changes over the synthetic vitality from a fuel into power through a concoction response of decidedly accused hydrogen particles of oxygen or another oxidizing agent.[1] Fuel cells are not quite the same as batteries in requiring a consistent wellspring of fuel and oxygen or air to support the substance response, while in a battery the chemicals display in the battery respond with each other to create an electromotive drive (emf). Energy components can create power ceaselessly for whatever length of time that these sources of info are provided.

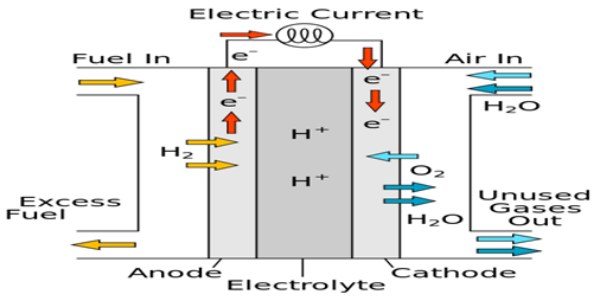

Fig 3.Fuel Cell

C. Microcontroller – Atmega8

Here we utilized of atmega8 chip which has of 28 stick description .the principle necessity of this processor is the mechanization control of the sprayer voltage of pv boards ,energy component and dc transport bar frameworks.
Give us a chance to see about of it's stick portrayal and taking after work of the processor that have specify above.
Pin Descriptions
VCC-Digital supply voltage.
GND-Ground.Port B (PB7..PB0) XTAL1/XTAL2/TOSC1/ TOSC2
Port B is a 8-bit bi-directional I/O port with interior draw up resistors (chose for each piece). The Port B yield cushions have symmetrical drive attributes with both high sink and source capacity. As data sources, Port B sticks that are remotely pulled low will source current if the draw up resistors are enacted. The Port B pins are tri-expressed when a reset condition gets to be distinctly dynamic, regardless of the possibility that the clock is not running. Contingent upon the clock determination intertwine settings, PB6 can be utilized as contribution to the altering Oscillator speaker and contribution to the interior clock working circuit. Contingent upon the clock determination intertwine settings, PB7 can be utilized as

yield from the transforming Oscillator intensifier. In the event that the Internal Calibrated RC Oscillator is utilized as chip clock source, PB7..6 is utilized as TOSC2..1input for the Asynchronous Timer/Counter2 if the AS2 bit in ASSR is set.

Port C (PC5..PC0)Port C is a 7-bit bi-directional I/O port with inside draw up resistors (chose for each piece). The Port C yield supports have symmetrical drive qualities with both high sink and source ability. As information sources, Port C sticks that are remotely pulled low will source current if the draw up resistors are initiated. The Port C pins are tri-expressed when a reset condition gets to be distinctly dynamic, regardless of the possibility that the clock is not running.

PC6/RESET If the RSTDISBL Fuse is modified, PC6 is utilized as an I/O stick. Take note of that the electrical qualities of PC6 vary from those of alternate pins of Port C. In the event that the RSTDISBL Fuse is un customized, PC6 is utilized as a Reset input. A low level on this stick for longer than the base heartbeat length will create a Reset, regardless of the possibility that the clock is not running. Shorter heartbeats are not ensured to produce a Reset.

Port D (PD7..PD0)Port D is a 8-bit bi-directional I/O port with inside draw up resistors (chose for each piece). The Port D yield supports have symmetrical drive qualities with both high sink and source capacity. As data sources, Port D sticks that are remotely pulled low will source current if the draw up resistors are actuated. The Port D pins are tri-expressed when a reset condition gets to be distinctly dynamic, regardless of the possibility that the clock is not running.

RESET

Reset input. A low level on this stick for longer than the base heartbeat length will create a reset, regardless of the possibility that the clock is not running. Shorter heartbeats are not ensured to create a reset.

AVCC

AVCC is the supply voltage stick for the A/D Converter, Port C (3..0), and ADC . It ought to be remotely associated with VCC, regardless of the possibility that the ADC is not utilized. On the off chance that the ADC is utilized, it ought to be associated with VCC through a low-pass channel. Take note of that Port C (5..4) utilize advanced supply voltage, VCC.

AREFAREF is the simple reference stick for the A/D Converter.

ADC7..6 (TQFP and QFN/MLF Package

In the TQFP and QFN/MLF bundle, ADC7..6 fill in as simple contributions to the A/D converter. These pins are fuelled from the simple supply and fill in as 10-bit ADC channels

D. Charger Controller

A charge controller, charge controller or battery controller restrains the rate at which electric current is added to or drawn from electric batteries .It forestalls cheating and may secure against overvoltage, which can diminish battery execution or life expectancy, and may represent a danger. It might likewise forestall totally depleting ("profound releasing") a battery, or perform controlled releases, contingent upon the battery innovation, to secure battery life. The expressions "charge controller" or "charge controller" may allude to either a remain solitary gadget, or to control hardware coordinated inside a battery pack, battery-fuelled gadget, or battery charger.

E. Boost converter

A boost converter (venture up converter) is a DC-to-DC control converter that means up voltage (while venturing down current) from its info (supply) to its yield (stack). It is a class of exchanged mode control supply (SMPS) containing no less than two semiconductors (a diode and a transistor) and no less than one vitality stockpiling component: a capacitor, inductor, or the two in blend. To diminish voltage swell, channels made of capacitors (now and then in blend with inductors) are regularly added to such a converter's yield (stack side channel) and info (supply-side channel).

4. WORKING

In this venture we have wanted to splash of pesticide for a predetermined range utilizing of economical vitality. In the first place iit is sun oriented vitality by simply gathering of sun oriented vitality utilizing of photovoltaic cells (pv cells) .this is procedure of changing over of light vitality to electrical vitality. This pv cells has primary material crystalline silicon and zinc sulphide (mpnocrystalline silicon cell).this framework yield voltage is given to the sunoriented charger control it comprises of force hardware gadgets (ie. buck and help convertor and so forth…).And after that we utilized here the energy unit which comprises of power module which depends on titanium .here we are going to synchronized the voltage in a dc transport bar with parallel synchronization .with the assistance of the parallel synchronization we get the required measure of output energy to run a heap engine This transport bar, power device and pv boards are controlled with the assistance of atmega 8 microcontroller .The output control from the dc transport bar is given to the du engine to create of wind current up to splash the pesticide fluid.

5. CONCLUSION

In this venture we simply rolled out an improvement that the mechanical running sprayer machine to gadgets based pesticide sprayer .With the assistance of these sprayer we lessened of the fuel utilized and the running expense of the engine even the underlying expense of the framework is minimal more than ordinary sprayer.this sprayer can splash of 200ltrs of pesticide fluid which is reasonable to shower for 2-3 sections of land of rural land (approx).the battery utilized here is 12v and 7amps which can with remain for 5-6hrs. this framework can be utilized as a part of pesticide showering and furthermore in painting and so on

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