

Solar Water Distiller Using Msp Exp-430 G2 And Msp 430 Launchpad

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Abstract

Distillation is the process that eliminates rottenness and foreign substances to create unadulterated water from accessible waste water. Various methods are available to distill waste water. The sand filtration framework is examined in this paper. Sand filtration based refining arrangement is exceptionally basic. It utilizes rocks, sand and coconut scrub which are easily available. The excellence of the Solar Water Purifier lies in its simplicity. Our main objective is to automate the entire purification process. Also, we are adding a water monitoring system to monitor the quality of the purified water. The results will be displayed on a web page using IoT technologies. Scaling it into a long-term project to meet a huge institution's water needs will not require much investment considering the cost of materials utilized and the amount of energy consumed.

Key words: *IoT, Software, Hardware overhead.*

INTRODUCTION

The one in each of the ways to decontaminate the sullied water known as sand water refining frame work. Further more, it might be choice as sand still it's a framework utilized for refining of water. This extend the indeed the made each dark and white covered sand stills and confirm the covering which supplies a part of power by tests. Single-bowl sand still development is direct, mono cost and variable in refining water with a tall add up to broken down salt substance and bacterium expulsion.

Water scarceness has become a critical issue in this day and age. this situation requests the need of defensive water assets. also, there's huge load of cutting edge innovations created in sanitizing and utilize squander water made. The reused water is keep inside the tank and utilized at whatever point the need emerges. The underground water level is low and decreasing on account of helpless precipitation. the speed of regular re-energizing inside the land arrangement has become moderate on account of the low amount of precipitation. furthermore, the water inside the borehole is diminishing in a matter of moments and wish for boreholes or expanding. Subsequently, the strategy for Cleaning and use water is that the need of this. initiated carbon is logically utilized for purging water. The reused water might be utilized for various functions. The principle objective of this examination study were accomplished as an improved sand water arrangement was planned and created by rising the intensity of the sand stills that having efficiency between thirty eighth and forty seventh. the extent of unadulterated water testing has a mean pace of sixty fifth. Double bowl sand still just as depleted cylinders was made. numerous analyses have done to build up the refining yield of a sand still. The exhibition of alone twofold bowl sand actually was analyzed therewith of still just as depleted cylinders with and keeping in mind that not covering of dark. At the outcome, refining yield is overstated to 56 by adding vacuum cylinders and sixty fifth by adding vacuum cylinders and dark stone rock in a really twofold bowl sand still. The sand channel is partner degree harmless to the ecosystem squander water treatment method, that is nearly clear and modest. Its rule includes permeating water through a sand bed. Schematically talking, grains of sand kind a layer that is entered by the water and which can stop bigger particles inside the spans between grains acting kind of a clear sifter. More modest particles will be kept up by the divider result on the grain surface after they nibbled a grain as they submit to the filter. The more modest the breadths of the grains, and accordingly the more extended particles stay inside the channel, the upper the channel's halting force are going to be. Slow sand filtration is essentially utilized for profluent treatment. For sure, it had been the essential procedure used by a few urban areas inside the nineteenth century to treat conduit and stream water prior to conveying it. These channels will just dispose of the majority of the miniature creatures that cause

water-borne infections, along with protozoa, bacterium and viruses. Water goes gradually through a layer of sand sixty to 120 cm thick. since it goes through, numerous physical and natural cycles channel the water and wipe out contaminants. After a specific time, the layer of sand contains a wreck of bacterium, alga and oceanic miniature creatures. These miniature life forms encourage filtration by disposing of foreign substances. Sand that contains these living beings is claimed to be "ready," and is best perfect or supplanted. This technique will require numerous weeks or months, per the water and its temperature. The layer of sand in the long run turns out to be almost close and hinders the progression of water ; it at that point ought to be spotless, normally by switching the course of stream of water to back rinse. Sand filtration frameworks can't deal with chlorinated water because of halogen includes a biased outcome on the channel's microorganism greenery. In the event that water ought to be chlorinated, this should exclusively be possible when the filtration strategy, in reservoirs. Storage of water before treatment allows the organization to be custom-made to a variable interest, as sand filtration frameworks can't offer higher paces of stream in times of popularity ; nor so lower paces of stream in times of low demand. These channels are exclusively suitable for spring water with a periodic dimness (low cloudiness water), containing next to no alga and with no disagreeable tone in view of pollution. they're not suitable for water with a high substance of alga or earth, that will in general stop up them. Spring waters affluent in supplements, in any case, will encourage the purging activity of moderate sand channels by helpful for their natural composition. They are ordinarily of a sensibly clear style, need next to no support and have an incidental financial plan items. This project begins with a conversation on the work of profound bed filtration in squander water treatment and presents distinctive associated filtration innovations like cartridge filtration, miniature sifter, precoat filtration.

EXISTING SYSTEM

Since from the ancient times humans used several methods to produce pure water from the waste water. For most of the time people boiled the water to get away from the deadly pathogens and diseases. Then they used animal skins to purify the sea water into pure water. The process is called Osmosis. But the increase in population demands the requirement of the pure water increases. It results in the increase in the discovery of various new inventions which could help the mankind. Most of them were a great success. Even though they produce great results they came up with some disadvantages. Since we referred a lot of published papers as a reference for our project we came up with some best solutions provided by the engineers. So we would like to discuss some the existing systems.

Water distillation is a process which converts the polluted water into pure water. Of all the base papers we have referred so far we came up with best solution for our experiment. In some of the papers we came after their experiments and we looked into their problems in their project. In one such existing project they used the Halogen lamps as the source to convert the waste water into pure water. Their experiment is too simple that the waste water will be fed into a chamber and then the water will be heated to a certain limit so that it evaporates and formed into water vapour. Then the water vapour will be cooled down and then condensed into liquid form. The process produces pure drinking water. It may seem simple but the project has some disadvantages. The amount of temperature required to evaporate the water is too high, such that the power requirements are too high. Also we need to discuss about the project setup they used a v shaped system to capture the condensed water. But the cost of setting the project is too high. Also they didn't included automatic purification system. And they did not talk anything about the quality of the water they purified. So these are some of the disadvantages came across their project.

Most of the water purifiers used in the house such as RO water filters use the electrolytic process which is considered to be the best solution to produce pure drinking water. But considering the amount of water required for drinking water to the water used for other purposes such as washing, bathing etc. Required much more water than others. So RO water purifiers cannot be used for such large scale productions. And also consider the amount of water required for some big buildings such as schools, colleges and IT industries use more amount of water. In such a case most of the papers we have referred has a disadvantage to meet the large scale requirement of the water to those sectors.

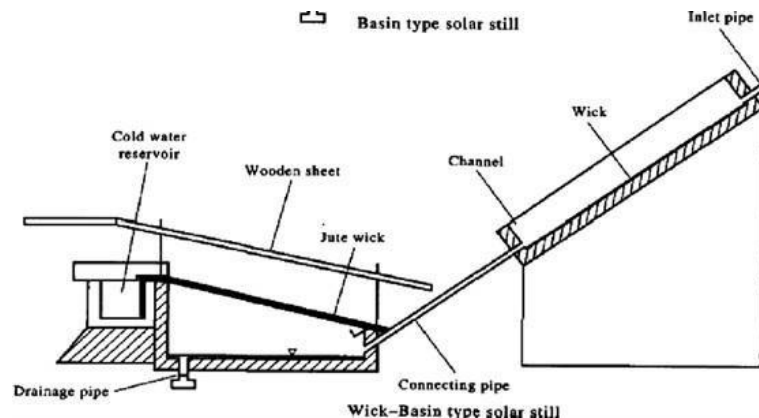


Fig.1. Block Diagram of Slanting model system

This project is sand Water producer. It uses the essential principle of distillation to purify waste product Water into Pure Potable Water. There square measure 2 PVC pipes during this project. The lower one in all the larger radius holds the dirty waste product water whereas the higher one in all the lower radius holds the recent water. The water within the lower PVC pipe is heated employing a 1000W group lamp (which acts a model of the Sun during this experiment). The rays getting into the clear sheet heat the water and therefore the convection currents cannot escape out of the model therefore making a atmospheric phenomenon, thereby increasing the temperature within. The sand on the skin includes a low heat energy capability. Therefore, it gets heat quicker and therefore the water within the lower PVC pipe is heated victimization physical phenomenon. therefore all the 3 modes of warmth transportation i.e. conduction, convection and radiation square measure wont to heat the water.

After 10-15 minutes of continuous exposure of the model to the group Lamp, the water begins to evaporate and condense on the clear Sheet on top of. The clear Sheet formed in such the simplest way that it's V in shape so the water condensed, thanks to gravity flows to directly on top of the higher PVC pipe. Then the condensation method happens and therefore the water collects within the higher pipe.

A valve is employed to regulate the recess flow into the lower pipe. Initially, the valve is open and lets the water flow in. because the water reaches the specified water level, the water sensors and send the command to the servo motor that closes the valve and therefore the water flow stops.

The group lamp heats up the water within the lower pipe and therefore the water evaporates. The water vapors condense on the clear sheet and once the dimensions of condensed water droplets increase, they get collected within the higher pipe.

Micro controller activates the pump and therefore the pure condensed water is drained out of pipe through a pipe. This producer can convert the whole emptying water from the faculty into pure drinkable free from soluble and insoluble impurities. this idea has been used by the tribe Arab living within the Sahara for hundreds of years to fulfill their water desires. This sand Water apparatus is incredibly economical because it utilizes everyday product. there's hardly any energy expenditure as most of the energy for the method is obtained from the Sun. The incident irradiation, the sand that includes a high heat energy capability will be simply heat to higher temperatures.

PROPOSED SYSTEM

The arranged framework is implemented with the help of every product bundle and equipment devices. This venture is named sand Water maker. It utilizes the key standard of refining to clean waste item Water into Unadulterated Consumable Water. A sluggish sand channel could be a sand channel specially crafted for unit use. If it's not too much trouble, note that however as a rule raised on the grounds that the Bio sand Channel language is exclusive to in any event one explicit style, and this page envelops all sluggish sand channels. The rendition most by and large implemented comprises of layers of sand and rock in an extremely concrete or plastic instrumentality near zero.9 meters tall and zero.3 meters sq.. The water level is kept up to 5-6 cm on top of the sand layer by setting the pinnacle of the power source pipe. This shallow water layer allows a bio

dynamic layer to develop on prime of the sand, that adds to the decrease of sickness causing living beings. A diffuse plate is utilized to hinder interruption of the bio layer once water is extra. To utilize the channel, clients simply empty water into the most elevated, and gather completed water out of the power source pipe into a container. After some time, especially if supply water is sloppy, the pace of stream will diminish. Clients will keep up pace of stream by progress the channel through provocative the most elevated level of sand, or by pre-treating sloppy water before filtration.

Moderate sand channel lab adequacy concentrates with a develop bio layer have shown ninety nine.98% protozoan, 90-99% microorganism, and variable incapable specialist decrease. Field adequacy contemplates have archived E. curl evacuation paces of 80-98%. 2 well being sway examines report 44-47% decrease of unconstipated disease occurrence in clients. aptitude has shown right channel upkeep is important} for best execution hence right client training and follow-up is basic to channel achievement. Since the channel is typically utilized while not coming about chlorination, instructing clients to appropriately care for and keep a protected stockpiling instrumentality is basic.

This channels gradually lose their exhibition on the grounds that the bio film thickens and subsequently decreases the speed of course through the channel. In the long run, it's important to reestablish the channel. 2 different ways square measure for the most part wont to do that. inside the underlying, the most elevated not many milli-meters of fine sand is scratched off to show a pristine layer of new sand. Water is then tapped into the channel and re-coursed for certain hours to allow a pristine bio-film to create. The channel is then packed to full volume and brought into administration. The subsequent approach, by and large known as wet difficult, includes bringing the water level down to just on top of the hypogeal layer, mixing the sand; so causative any solids order in that layer and allowing the excess water to clean through the sand. The channel section is then packed to full ability and brought into administration. Wet agonizing will empower the channel to be brought into administration extra rapidly.

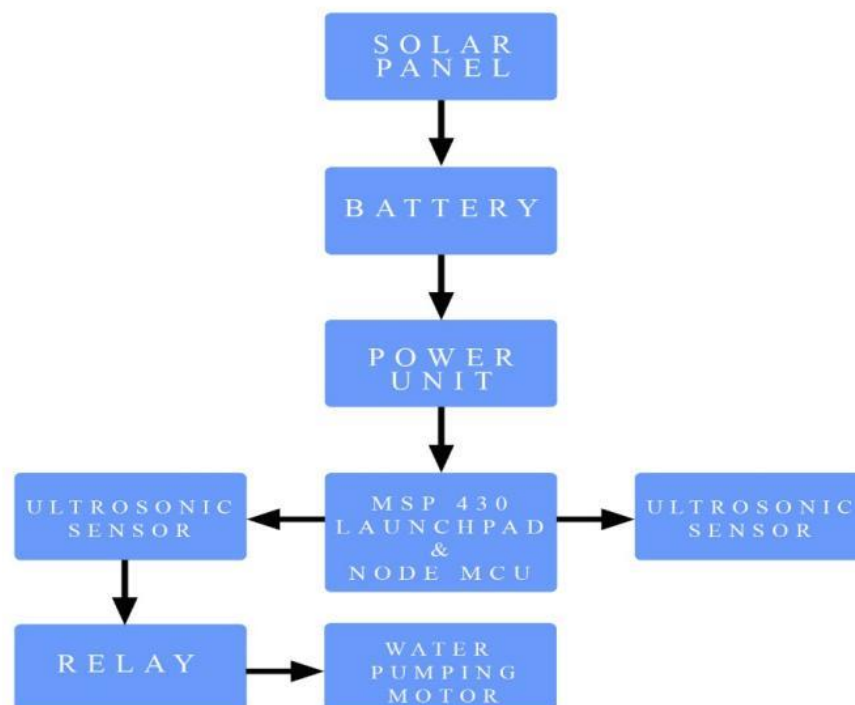


In contrast to elective filtration ways, moderate sand channels utilize natural cycles to clean the water, and territory unit non-compressed frameworks. Moderate sand channels needn't bother with synthetic substances or power to control. improvement is generally done by utilization of a mechanical hand instrument, that is commonly crashed into the channel once the bed has been dried out. In any case, some lethargic sand channel administrators utilize a route known as "wet frightening", any place the sand is scratched though still under water, and thus the water utilized for development is depleted to waste. For city frameworks there now and then could be a bound level of repetition, since it's interesting for the most extreme required out turn of water to be possible with one or a great deal of beds unavailable. Moderate sand channels need similarly low sloppiness levels to control with effectiveness. In summer conditions with high microorganism movement and in conditions once the crude water is sloppy, display of the channels due to bio obstructing happens a great deal of rapidly and pre-treatment is suggested. This sand Water arrangement is amazingly affordable on the grounds that it uses regular item. there's not really any energy use as the vast majority of the energy for the strategy is gotten from the Sun. so this task is totally machine-constrained by IoT device. The components utilized like Stones, sand, charcoal and coconut scour region unit normally available and it's without contamination and suitable for large scope purging technique. of these components territory unit set inside an instrumentation each holding a ten centimeters height. The aftereffects of the sublimate water and thus the

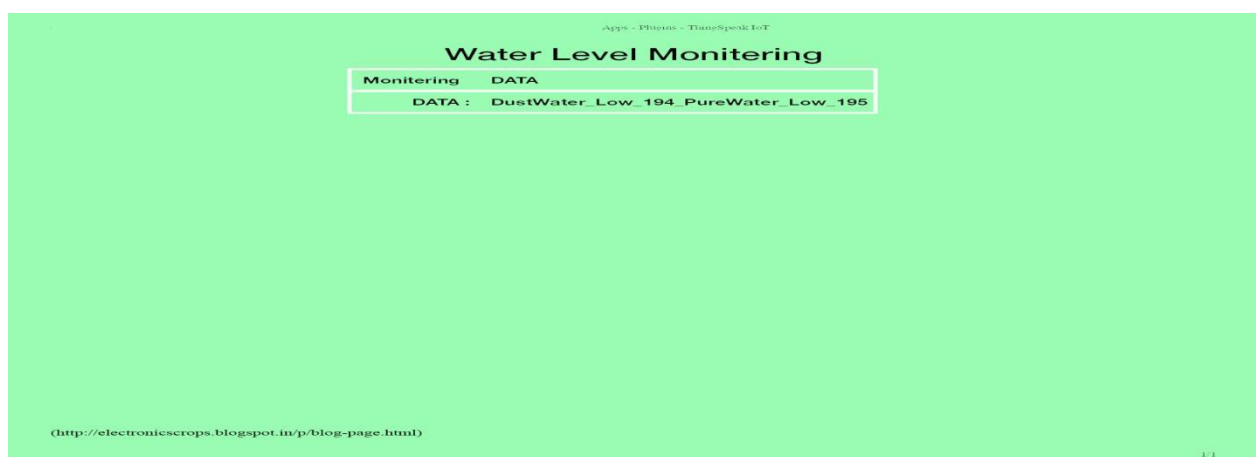
amount of water sublimates from the waste water zone unit showed inside the site exploitation IoT innovations. With the help of components like Hub MCU we will essentially be ready to move the information. conjointly adding hypertext increase language code gives fundamental subtleties to the site page.

Advantages:

- Demonstrated decrease of protozoa and most microbes.
- High stream pace of up to 0.6 liters each moment.
- Effortlessness of utilization and worthiness.
- Visual improvement of the water.
- Creation of adequate amounts of water for all family employments.
- Nearby creation (assuming perfect, fitting sand is available) One-time establishment with low support prerequisites).



4.1 OUTPUT ANALYSIS



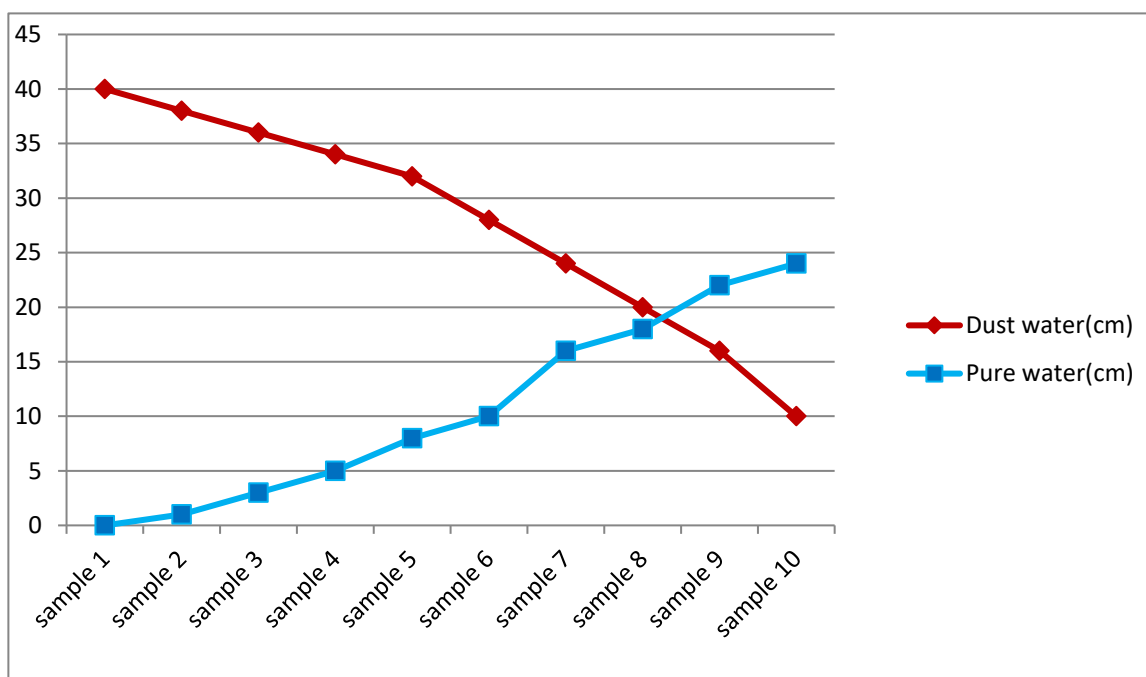


Fig 4 Result Display

Fig shows the level monitoring system. It displays the level of both dust and pure water in cm automatically for every 5 seconds. Fig shows the comparative analysis of dust and pure water. For example, we have taken 10 samples. For every sample, the level of dust and pure water has been analyzed. The graph shows that when the level of dust water reduces, the amount of pure water level gets increases.

CONCLUSION AND FUTURE WORK

This project offers automation and radio-controlled management in water purification by using MSP 430 G2 and IoT technology based mostly invention. Mostly in all our homes Reverse Osmosis technique is used for water purification. But when we use RO system, it filters all the minerals in water and gives only the purified water. So we are using natural filtration process, which provides purified water with minerals and nutrition's. The planned system is financially reasonable and power effective organization. The planned system reduces the person power and reduces the possibility of errors. The model is simple to implement and use.

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