

SMART AGRIBOT

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Abstract: This paper presentation and approach for smart agribot to integrate with computer vision web server and cross platform mobile services this project aim to increase the agricultural sector after a large extent it focus on during pharmacy technology that they can approach and increase the productivity we normally used microcontroller and tiny computer subsystem into this project this cloud platform and open source design will help farmers to grow for a prosperous country Particular given technology is already being used in some advanced sectors it is time to be used in in India An Atmospheric Water Generator is an appliance that employs dehumidification/condensing technology that extracts water from the humidity in the air. The water is then filtered and purified through several filters including carbon, and reverse osmosis, and UV sterilization lights. The result is pure drinking water from the air. An Atmospheric Water Generator Works on the same principle as a refrigerators and air conditioners i.e. on the principle of cooling through evaporation. The Atmospheric water generator works by converting atmospheric air to pressurized air using a Compressor and then this air is then passed through Condenser pipes which decreases it's temperature to dew point. The air condenses to liquid and is passed through a filtration system and it is then stored in a tank. The major aim or objective of our project is to provide safe and clean drinking water to those areas which are facing water shortage problems or where water transportation through regular means is expensive (especially rural areas). Our project hopes to reduce this problem by providing an atmospheric water generator that will run via bicycle-gear arrangement stand-alone renewable source of energy i.e. either solar or wind.

Keywords: Water condensation, Thermoelectric peltier, Dew condensation (latent heat), Wireless communication.

I. INTRODUCTION

The Atmosphere contains water in the form of water vapor, moisture etc. Within that amount almost 35% is wasted. This amount of water can be used with the help of a Atmospheric Water Generator. This device is capable of converting atmospheric moisture directly into usable and even drinking water. The device uses the principle of latent heat to convert water vapor molecules into water droplets. In many countries like India, there are many places which are situated in temperate region; there are desert, rain forest areas and even flooded areas where atmospheric humidity is eminent. But resources of water are limited. In the past few years some project have already been done to establish the concept of air condensation as well as generation of water. So, this project

will be helping to extend the applications of such devices further in the near future. According to previous knowledge, we know that the temperature require to condense water is known as dew point temperature. Here, the goal is to obtain that specific temperature practically or experimentally to condense water with the help of some electronics devices. This project consists of a bicycle gear arrangement for running a condenser which is used to create the environment of water condensing temperature or dew point, indeed conventional compressor and evaporator system could also be used to condense water by simply exchanging the latent heat of coolant inside the evaporator. The condensed water will be collected to use for drinking purpose and various other uses

II. PURPOSE

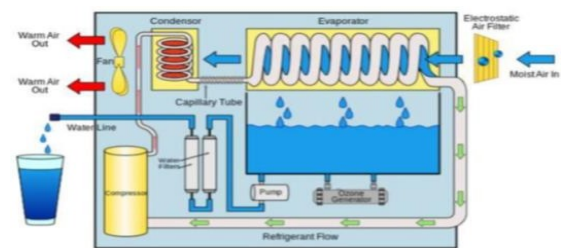
This paper addresses an Autonomous Agricultural Robot An agricultural robot is a robot deployed for agricultural purposes. The main area of application of robots in agriculture today is at the harvesting stage. Emerging applications of robots or drones in agriculture include weed control, cloud seeding, planting seeds, harvesting, environmental monitoring and soil analysis. According to Market Research Engine, the agricultural robots market is expected to reach 75 billion by 2025, and maximizing safety and security of homes.

2.1 Future Scope

The robots can become independent to carry the water throughout the field. Also the robots can plant the seed. Also in the harvesting season we can use robots to harvest this through out the field. Can be used to easily regulate the fruits and the farming equipment

III. IMPLEMENTED SOLUTIONS

Block Diagram and Working



BLOCK-DIAGRAM

The Atmospheric Water Generator works on the same principle as a Refrigerator and Air Conditioner. So, how does a refrigerator work? Refrigerators and air conditioners both work on the principle of cooling through evaporation. The refrigeration process begins with the compressor. Ammonia gas is compressed until it becomes very hot from the increased pressure. This heated gas flows through the coils behind the refrigerator, which allow excess heat to be released into the surrounding air. Eventually the ammonia cools down to the point where it becomes a liquid. This liquid form of ammonia is then forced through a device called an expansion valve.

Since this evaporation occurs at -27 degrees F (-32 degrees Celsius), the ammonia draws heat from the surrounding area. Cold material, such as the evaporating ammonia gas, tends to take heat from warmer materials. As the evaporating ammonia gas absorbs more heat, its temperature rises. Coils surrounding the lower refrigerator compartment are not as compact. The cool ammonia still draws heat from the warmer objects in the fridge, but not as much as the freezer section. The ammonia gas is drawn back into the compressor, where the entire cycle of pressurization, cooling and evaporation begins.

In a cooling atmospheric water generator, a compressor circulates refrigerant through a condenser and then an evaporator coil which cools the air surrounding it. This lowers the air temperature to its dew point, causing water to condense. A controlled-speed fan pushes filtered air over the coil. The resulting water is then passed into a holding tank with purification and filtration system to help keep the water pure and reduce the risk posed by viruses and bacteria which may be collected from the ambient air on the evaporator coil by the condensing water. The rate at which water can be produced depends on relative humidity and ambient air temperature and size of the compressor. Atmospheric water generators become more effective as relative humidity and air temperature increase. As a rule of thumb, cooling condensation atmospheric water generators do not work efficiently when the temperature falls below 18.3 C (65 F) or the relative humidity drops below 30 percent. This means they are relatively inefficient when located inside air-conditioned offices. The cost-effectiveness of an AWG depends on the capacity of the machine, local humidity and temperature conditions and the cost to power the unit. Water is often condensed from the air in the air conditioners when the ambient air is humid and hot in coastal tropical regions. This water can be conveniently used for drinking purpose. The amount of water vapor at any time is usually less than that required to saturate air. The Relative Humidity is a percent of saturation humidity, generally calculated in relation to saturation vapor density. The relative humidity is expressed as a percentage, so the maximum is 100 Percent. The formula for relative humidity is: $\text{Relative humidity percent} = \frac{\text{Moisture in the air now}}{\text{Maximum possible moisture air can hold at the current}}$

temperature (x100) Hence more the humidity in air and cooler the surrounding temperature, the more will be the water output. In systems involving heat transfer, a condenser is a device or unit used to condense a substance from its gaseous to its liquid state, by cooling it. In so doing, the latent heat is given up by the substance, and will transfer to the condenser coolant. Condensers are typically heat exchangers which have various designs and come in many sizes

Hardware Description, Circuit diagrams

1. Atmega 328p Micro Controller kit

The atmega 328p microcontrollers are based on a 32-bit CPU with real-time emulation that combines the microcontroller with or 32 kB of embedded high speed flash memory 32-bit microcontroller in a tiny LQFP48 package. 2 kB of on-chip static RAM and 32 kb on-chip flash program memory. 128-bit wide interface / accelerator enables high-speed 70MHz operation. In-System. In-Application Programming (ISP/IAP) via on-chip boot loader software. Single flash sector or full chip erase in 100 ms and programming of 256 bytes in 1 ms.

2. DHT 11 Humidity and Temperature Sensor

DHT11 Temperature and Humidity Sensor features a temperature and humidity sensor complex with a calibrated digital signal output. By using the exclusive digital signal acquisition technique and humidity sensing technology, it ensures high reliability and excellent long-term stability. This sensor includes a resistive type humidity measurement component and an NTC temperature measurement component, and connects to a high performance 8-bit microcontroller, offering excellent quality, fast response, anti-interference ability and cost-effectiveness.

3. LCD Display

It is a basic 16 x 2 LCD monitor in order to display the condition of the connected devices and hence in this manner we will be able to detect all the on and off devices that a particular location the information will be displayed on the LCD display in on and off manner

4. RF Module

The TX is an ASK transmitter module. The result is excellent performance in a simple-to-use. The TX is designed specifically for remote-control, wireless mouse and car alarm system operating at 315/433.92 MHz. The RX is a miniature receiver module that receives On-off keyed modulation signal and demodulated to digital signal for the next decoder stage. The result is excellent performance in a simple-to-use, with a low external component count. The RX is designed specifically for remote-control and wireless security receiver operating at 315/434MHz.

5. Relay

Relay is a device used to on and off the high voltage devices

however the microcontroller can't be directly communicated to the high voltage devices hence the relay circuit is used in order to communicate between 250 volt and 5 volt in this manner we receive the proper operation of the high voltage devices hence relay circuit is very important in this kind of projects

6. Power supplies

The power supplies the most important part of the average circuit in this given type of circuit there are three basic type of power supply first 5 volt for the microcontroller second 12 volt for the relay circuit 3rd 250 volt for the whole system on and off that is the devices Has power supply is considered as the one of the important part of the iot based device controller circuit

7. Soil Moisture Sensor

This sensor can be used to test the moisture of soil, when the soil is having water shortage, the module output is at high level, else the output is at low level. By using this sensor one can automatically water the flower plant, or any other plants requiring automatic watering technique. Module triple output mode, digital output is simple, analog output more accurate, serial output with exact readings.

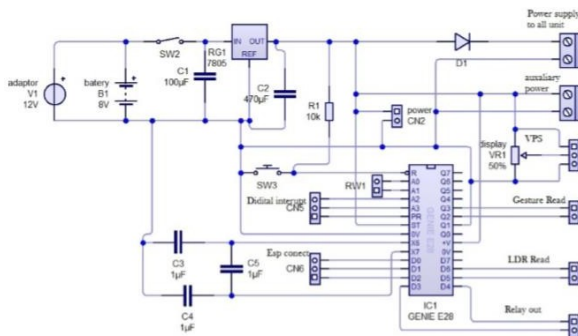


Figure: CIRCUIT

The given architecture provides the base circuit for the aggregate production model the circuit diagram will vary accordingly while implementing the project this is the easiest and the base circuit diagram which will be modified according to the project requirement what's the actual implementation and the programming order digitization parts start the circuit diagram will varying the final circuit diagram will come up once the project is been completely implemented into the circuit diagram drawing software hence we can change the GPS and GSM in form of RF and ESP 8266 because every system works on a seven working model hens serial communication is ok with GPS GSM ESP 8266 and RF model

The actual implementation project works alongside by side of the circuit building as well as testing continuously and be perfect circuit diagram will evolve at the time of making the project this circuit

diagram usually gets divided into two parts the base project and the robot project both of the project will be requiring a different circuit diagram with a separate microcontroller control unit and also the different communication channel base base and the robot will communicate between each other with the Rs RF signal also the system will communicate using ESP 8266 WiFi model which will be web based interface and hence can be communicated with any of the Wi-Fi devices or from the internet.

In the given circuit diagram all the sensors are connected to the analogue pin and the GPS system is connected to the digital pin GPS system communicate using the serial port and also the GSM system also using the serial communication between the microcontroller and GSM module all the sensors are analogue hence they are connected to the analogue pin where as the clock is also provided to the microcontroller using 16 megahertz crystal and the power supply uses 7805 to rectify the 12 volt input this 12 volt is given with the battery of 12 volt and also directly through the ad activities at a point directly change the battery whenever connected

IV. RESULTS

The solar cell unit is to be installed in this system, rated as output of 12 V with the maximum output power of 120 W, evidently which is able to supply enough power to keep running three 40 W (3.5 A) Peltier coolers (TEC1) connected in parallel. The Peltier device has a dimension of 4x4x0.8 cm. The maximum temperature difference i.e. ΔT of 87°C. A 3000rpm, 15x15cm (size of TEC1) fan that is capable of producing airflow of at most 500 cfm is used for circulation of the air. The heat sinks are made of aluminium and anodized. Activated carbon filter are used for water filtration. Two temperature sensors and ATmega328 series microcontroller can be used for temperature control.

V. DISCUSSION

The device uses the principle of latent heat to convert water vapour molecules into water droplets. In many countries like India, there are many places which are situated in temperate region; there are desert, rain forest areas and even flooded areas where atmospheric humidity is eminent. But resources of water are limited. In the past few years some projects have already been done to establish the concept of air condensation as well as generation of water with the help of peltier devices, such as harvesting water for young trees using Peltier plates. So, this project will be helping to extend the applications of such devices further in the near future. According to previous knowledge, we know that the temperature require to condense water is known as dew point temperature. Here, the goal is to obtain that specific temperature practically or experimentally to condense water with the help of some electronics devices. This project consists of a thermoelectric peltier (TEC) couple , which is used to create the environment of water condensing

temperature or dew point, indeed conventional compressor and evaporator system could also be used to condense water by simply exchanging the latent heat of coolant inside the evaporator. The condensed water will be collected to use for drinking purpose and agricultural purposes.

VI. CONCLUSION

Hence in this project we concluded that the old age traditional farming technology and the new age engineering systems can collaborate with each other and form a glorious tomorrow for the human being hence we will be looking forward to develop subsystems which will be helpful for the farmers as well as the 60 percent of the Indian farming people we concluded that the farming system needs to be upgraded with the latest engineering subsystem and most important the water problem can be solved using the technology

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