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"Solar Water pumping System and Dryer using IoT"

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Abstract – *A solar-powered pump is a pump running on electricity generated by photovoltaic panels or the radiated thermal energy available from collected sunlight as opposed to grid electricity or diesel run water pump. Here excess amount of heat is generated at back side of solar panel due to which the efficiency of solar panel will decrease, to avoid this the heat is utilized for another agricultural application called as Dryer. This paper investigates a remote monitoring system using Zigbee and GSM module. Zigbee send data wirelessly to a central server, which collects the data, stores it and will be transferred to cloud cloud through GSM module. And also data can be seen at client mobile through App.*

Keywords: Photovoltic panel, Zigbee, IOT

1. INTRODUCTION

Photovoltaic (PV) panels are often used for agricultural operations, especially in remote areas or where the use of an alternative energy source is desired. In particular, they have been demonstrated time and time again to reliably produce sufficient electricity directly from solar radiation (sunlight) to power livestock and irrigation watering systems. A benefit of using solar energy to power agricultural water pump systems is that increased water requirements for livestock and irrigation tend to coincide with the seasonal increase of incoming solar energy. When properly designed, these PV systems can also result in significant long-term cost savings and a smaller environmental footprint compared to conventional power systems. The volume of water pumped by a solar powered system in a given interval depends on the total amount of solar energy available in that time period. Specifically, the flow rate of the water pumped is determined by both the intensity of the solar energy available and the size of the PV array used to convert that solar energy into direct current (DC) electricity. The principle components in a solar-powered water pump system is the Internet of Things (IOT).

2. PROPOSED SYSTEM

A solar-powered pump is a pump running on electricity generated by solar panels or the radiated thermal energy available from collected sunlight. The operation of solar powered pumps is more economical mainly due to the lower operation and maintenance costs and has less environmental impact than pumps powered by internal Combustion engine (ICE).

Drying is one of the methods used to preserve food products for longer periods. It has been established as the most efficient preservation technique for most tropical crops. This project presents the design, construction and performance of a solar dryer for food preservation. In the dryer, the heated air from a separate solar collector is passed through a glass, and at the same time, the drying cabinet absorbs solar energy directly through glass arrangement.

The energy is very much important concept in the next few years. There are many more energy sources that are almost near to die. So that using the solar energy in our day to day life is quite improving and energy saving concept. Solar power is a life time energy source it will not going to be shortage at any time. Soth at, the main focus to design model water motor pump which will be work on solar energy.

3. ANDROID MOBILE APP:

Here we are developing an android app. This is a user node, which is used to upload as well as download the data from server. The user can upload information such as Temperature and humidity etc. Along with time and his name via SMS. The server has software with a access Database. The software will update the database sent by the user via Android APP. When someone sends an enquiry, SMS he just has to type the name and he will get all the info uploaded to the server.

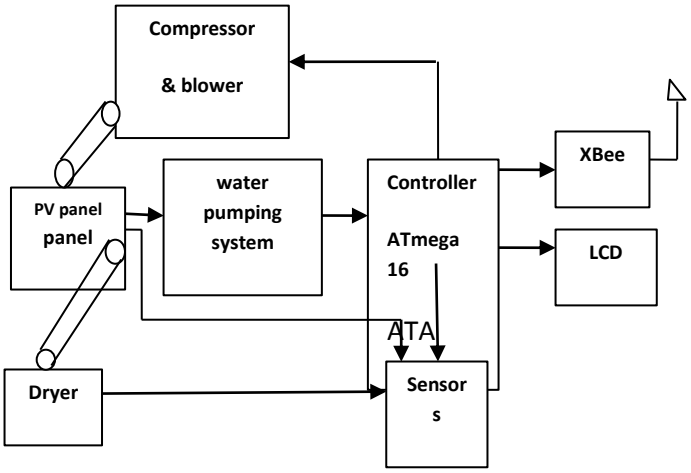


Fig.1 Block diagram of Transmitter

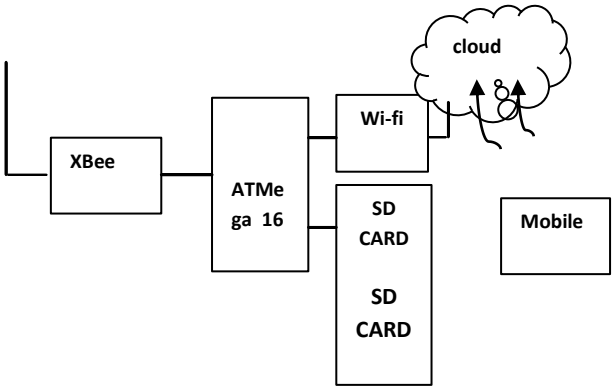


Fig. 2 Block diagram of Receiver

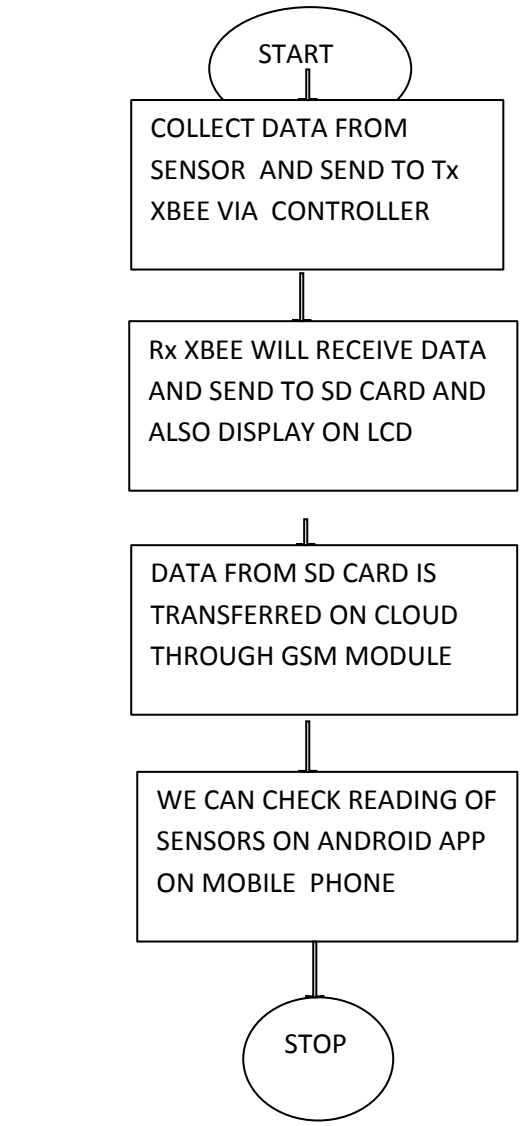
Solar panel will generate electricity and is used for operating pump and excess amount of heat will bring down efficiency of solar panel hence heat is utilized for drying agricultural products. Different types of sensor such as Temp., Humidity, Irradiation, Weight, voltage, current, Water flow and Air flow are used for monitoring and controlling of dryer and water pumping system by use of term " Internet of Things". These various sensors will measure their according parameters send information to controller to take necessary control action convenient for these parameters .Also this information is transferred to SD card for storage for further analysis. At the same time the information will be displayed on LCD display. Now the stored information on SD card is transferred over internet through Wi-Fi which will be globally available for person anywhere in the world so that remote controlling of system will be possible.

Solar panel will convert sunlight into electrical signal and thus whole system will be operated on this supply. It will give high output in the afternoon and low in the evening. The irradiation sensor pyranometer will measure the irradiance of sun which will be high in afternoon and low in the evening. Hence accordingly the speed of blower can be changed to blow hot air into the cabinet. Water level sensor will detect water level in the tank and accordingly on/off of the motor is achieved remotely through application.

4. SYSTEM REQUIREMENT ANALYSIS

The main aim of the proposed system is to save the environment. System is based on IoT. In IoT implements various ideas and applications. All those various ideas and application built in single app. This app is useful for every citizens and government authority. This purpose system mobile app is maintain all data like temperature and humidity etc. In Fig. shows, the exact flow of the system .When system is starts initialization of the system is started then data is collected from different sensors .This collected data. When range changes database is updates and informs to respective authorized person and the also requesting citizens through android app.

5. FLOWCHART:



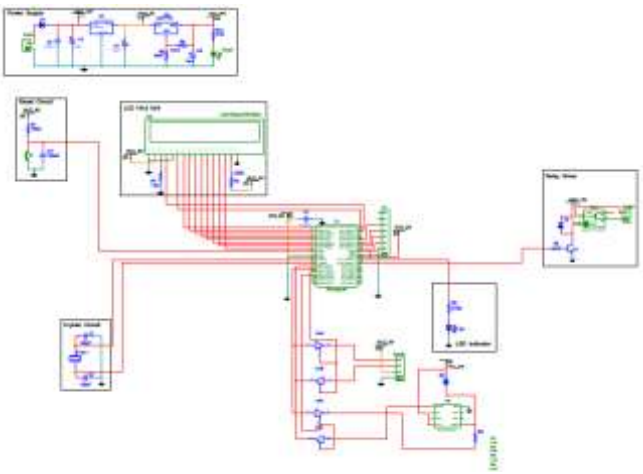


Fig. 3 Circuit diagram

6. Results:

7. ADVANTAGES:

1) Solar powered pump will provide efficient use of freely available solar energy.
2) Efficiency of solar panel is improved due to Dryer

8. APPLICATION:

1) Useful for supplying water in the area where sufficient source of energy is unavailable.
2) Can be used for drying Dry fruits by removing moisture content.

9. CONCLUSION

IOT based water pumping system will allow the user to remotely control operation and Dryer will maintain accurate conditions as required.

10. ACKNOWLEDGMENT

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