



Development of Grain Moisture meter with Moisture and Price Display

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ABSTRACT

Moisture content of grain is one of the important parameters always considered when deciding the quality and price of grain, at the stage of harvesting, storage, processing and marketing. Grain having excess moisture content, if stored for long duration, will spoil due to insect/fungus infestation. Portable, field usable and easy-to-use direct moisture (%) & price display Grain Moisture Meter is necessity for the benefit of farmers. The types of Grain Moisture Meters available in the market with Look up tables, which cause inconvenience when carrying out measurements. This system provide the moisture of grain but in this system we got the problem, from which the moisture percentage commodities have to be obtained due to which we get the less accuracy and it is somewhat complicated. So to overcome this problem we have developed Grain Moisture Meter which due to its novel design, eliminate this problem and gives moisture (%) and price directly on a LCD display.

Keywords: Moisture sensor, DHT sensor, Arduino Uno, LCD Display

INTRODUCTION:

The quality of grain is influenced by its moisture content. Knowledge of the moisture content of food grains is required for various reasons such as the need to know the optimum stage of harvesting, whether the grains, could be stored for extended period of time, to decide the price of grains, and for research and development purposes. Conventional methods of moisture measurements in grains like oven-dry

method, distillation method, drying with desiccants etc., are time-consuming laboratory methods.

Fast as well as field usable portable Grain Moisture Meter is a necessity to meet the requirements of farmers, grain storage personnel, and agricultural products marketing corporations. In this project we are going to use moisture sensor to sense the moisture (%) level of grain in container. The basic concept of an moisture sensor based on capacitance to measure dielectric permittivity of the of the grain where dielectric permittivity is a function of the water content. The sensor creates a voltage proportional to the dielectric permittivity. They can be very to use, just insert it into the grain and then read it, with the help of this sensor. This moisture sensor uses the two probes to pass current through the grain, and then it reads that capacitance to get the moisture level. These items have low power consumption, and high sensitivity, which are the biggest characteristics of this module.

The sensor is used in this system is DHT sensor to detect the humidity present in the grain and surrounding temperature. By using the exclusive digital-signal-acquisition technique and temperature & 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.

The establishment of project is beneficial to the agricultural products marketing corporations where they want to measure the level of moisture content and observe it on display to provide accurate method to know the amount of moisture in the grain.

LITERATURE SURVEY

The existing system is not secure as compared with proposed system because the proposed system provide the moisture content of grain directly into the display and according to that it shows the cost of that grain. Also it shows its storage period and how much loss will be occur is predicted.

This method permits moisture measurement over a wider range than conductance method, and properly calibrated capacitance type grain moisture meters work satisfactorily within $\pm 1\%$ accuracy, which serves almost all practical purposes in agriculture. The paper explains the development of grain moisture meter based on the capacitance principle.

Grain is unique among the world's major crop because of its many uses and its capability to adapt to climatic, agricultural, and cultural conditions. [1]

PROPOSED SYSTEM

The block diagram for proposed system is as shown in the fig. The major components used in the system are Arduino, moisture sensor, DHT sensor, LCD display.

The moisture sensor and DHT sensor is connected to the arduino UNO board. The moisture sensor uses the

Two probes to pass current through the grain, and then it reads that capacitance to get the moisture level. It will be helpful to remind you to check the moisture of grain or to monitor the grain moisture in the area where grain is stored. The IO expansion shield is the perfect shield to connect this sensor to arduino. The sensor creates a voltage proportional to the dielectric permittivity and the measured moisture (%) will be display on the LCD display.



Fig. Moisture Sensor

The sensor is used in this system is DHT sensor to detect the humidity present in the grain and surrounding temperature. By detecting the amount of moisture and humidity present in the grain and surrounding temperature the moisture level and price has been displayed on LCD.

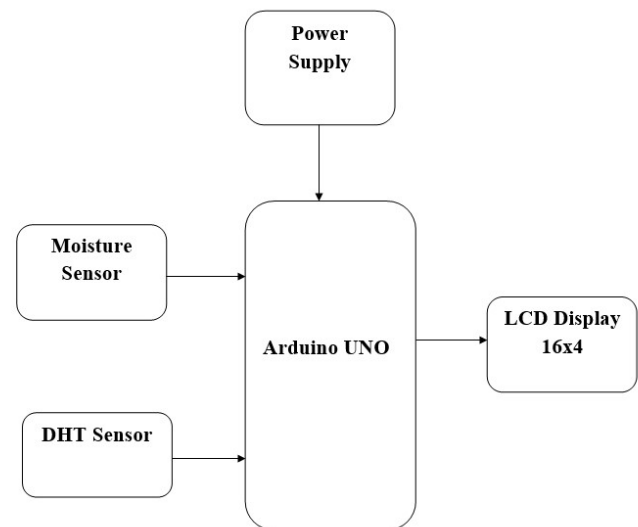


Fig. Block Diagram

The electronic circuit of the system is depicted in above fig high frequency square wave oscillator excited the sensor. The voltage regulator is used to provide the constant supply to the component that are used in the hardware by using IC.

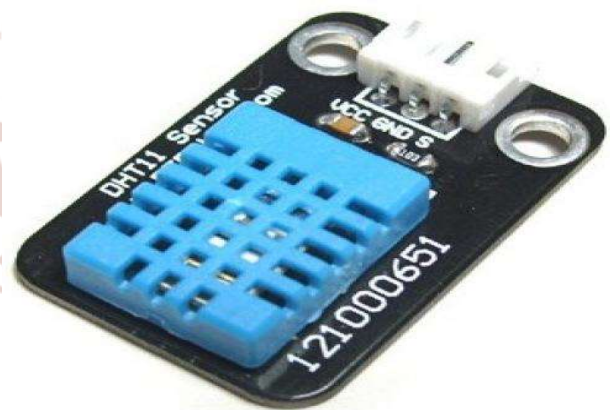


Fig. Dht Sensor

The sensors i.e rice moisture sensor and DHT sensors collect the data according to moisture of the rice and the display the condition of rice whether its quality is good, medium or bad on a LCD display. Using that data the user can take the correct action to avoid the wastage.

CONCLUSION

A portable, a field usable digital Grain Moisture Meter and operating with single 5V battery has been developed. Whereas Grain Moisture Meter using capacitor type of sensors are available in the market, all such systems provide printed look-up tables along with their instruments, from which the moisture percentage of diverse commodities have to be obtained. Our systems because of the direct display of moisture (%) and price of different a commodities using simple techniques explained above. Since the sensor of our system is based on moisture and the grain is acting as dielectric medium of the sensor, temperature and humidity variations in grain introduced by using DHT sensor. However the developed instrument is working satisfactorily for all practical purposes and grain moisture with an accuracy.

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