



## Bagasse Level Monitoring System

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### ABSTRACT

As industrial revolution approaching towards automation they need to upgrade their manufacturing process. We were visited to Siddhanath sugar factory, in boiler section, we found a problem with bagasse silo that it doesn't indicate how much bagasse is in silo. Hence the workers don't know how much amount bagasse in the silo? In all sugar industries the cane after processing is left with the waste product called "Bagasse". The Bagasse produced in the mills is used as a fuel to boilers and the generation of steam. The steam thus produced is expanded in turbines and the power is generated. As the bagasse used for boiler to heat up and it is as per their requirement the bagasse will be used. They are used glass on middle of silo to know the amount of bagasse. But it requires a human being to observe it. Hence to reduce the human errors, we are making a system which will show amount of bagasse in silo.

**Keywords:** Bagasse, Ultrasonic sensor, Arduino Uno, LCD Display, DC Motor.

### INTRODUCTION

Bagasse is the material obtained after extraction of juice from sugarcane stalk. It is used as fuel in co-generation plant of sugar mills but is burnt directly in furnaces. Accurate, affordable and reliable level measuring technology is of great importance for industrial, domestic and other varieties of applications. Level measurement control sensors used in many industries fall into two main types: Point level measurement sensors and Continuous level sensors.

Continuous level sensor unlike unlike point level measurement sensors measure fluid level within a

range, rather than at a one point. In this project we are going to use ultrasonic sensor to sense the level of bagasse in silo. The ultrasonic sensor have transmitter and receiver to detect the level of bagasse. The basic concept of an Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object. That sensed signal will be showing on a display it will show a percentage of amount of bagasse from the silo.

The level measurement unit which will depend on ultrasonic sensor and it showing on display through microcontroller. The digital indication of the level of bagasse which is present in the bagasse silo.

When the silo will be filled up by bagasse to the maximum level the door will be closed and when the bagasse at the minimum level the door will be open automatically. The door mechanism will be controlled by the arduino UNO controller.

This system will be used to reduce the man power that required with the current process. To provide accurate method to know the amount of bagasse in silo. The establishment of project is beneficial to the all the industries where they want to measure the level of solid content and observe it on display. . It will be mostly useful in complex industrial instrumentation process.

## LITERATURE SURVEY

Distance Sensing with Ultrasonic Sensor and Arduino. N. Anju Latha, B. Rama Murthy, K. Bharat Kumar Department of Instrumentation, Sri Krishnadevaraya University, Anantapur, A.P., India. Bats are wonderful creatures. Blind from the eyes but the vision is sharper than humans, Ultrasonic ranging is the technique used by bats. Ultrasonic sensor provides an easy way in distance measurement. The sensor is perfect for distance measurements between moving or stationary objects. Ultrasonic Sensor measure the distance of the objects in air through non-contact technique. They measure distance without damage and are easy to use and reliable.

Ultrasonic level measuring Marko Ilijanić, Mato Fruk, Goran Malčić, Zagreb Polytechnic, Ivana Lučića 5, Zagreb, Hrvatska. This paper describes the device for measuring the level with contactless method by an ultrasonic sensor. The advantages of the ultrasonic level measuring are low price of transducers, simplification of processing the information and the fact that changes in pressure, temperature or type of materials in container do not affect measuring.

A Multi-Level Storage Tank Gauging And Monitoring System Using A Nanosecond Pulse. Salah I. Yahya Software Engineering Department, Faculty of Engineering, Koya University University Park, Danielle Mitterrand Boulevard, Koya KOY45 Kurdistan Region - F.R. Iraq, International Journal of Engineering Trends and Technology (IJETT) – Volume 5 number 1- Nov 2013 ISSN: 2231-5381 <http://www.ijettjournal.org> Page 17.

## PROPOSED SYSTEM

The block diagram for proposed system is as shown in the fig. This system eliminates the human involvement from the existing system. The major components used in the system are Arduino, ultrasonic sensor, LCD Buzzer and DC motor. The ultrasonic sensor will measure the level of bagasse from the silo. The ultrasonic sensor is connected to the arduino board and the measured level will be display on the LCD display. The motor will be used for the door mechanism [2].

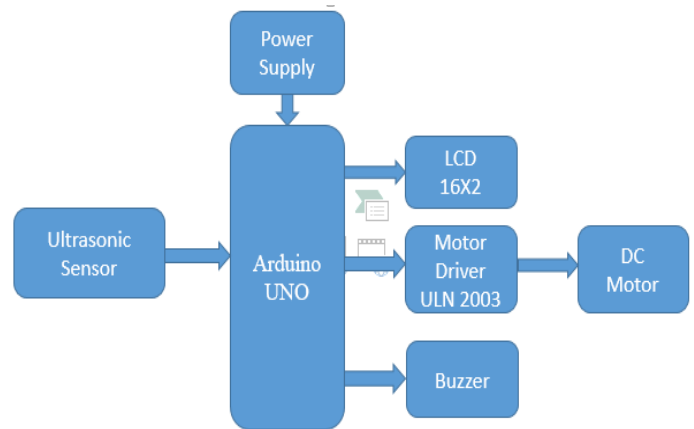


FIG. BLOCK DIAGRAM

Ultrasonic sensor emits an ultrasound at 40 KHz which travels through the air and if there is an object or obstacle on its path. It will bounce back to the module. Considering the travel time and the speed of the sound you can calculate the distance.

$$\text{distance} = \frac{\text{speed of sound} \times \text{time taken}}{2}$$

This distance will be converted into equivalent percentage and it will be displayed on LCD display. In order to generate the ultrasound you need to set the Trig on a High State for 10 μs. That will send out an 8 cycle sonic burst which will travel at the speed sound and it will be received in the Echo pin. The Echo pin will output the time in microseconds the sound wave traveled.

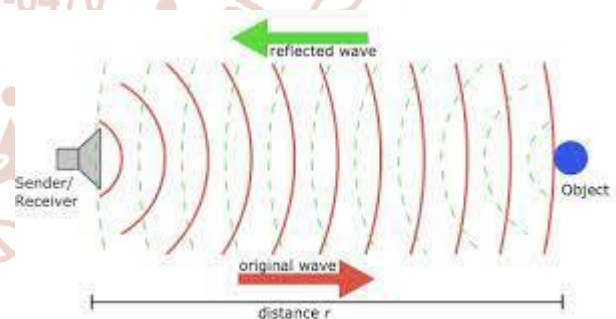


FIG. Operation of ultrasonic sensor

This is the basic operation of ultrasonic sensor which will transmit the input signal from it and receive the reflected signal.

## CONCLUSION

Considering all the design parameters, real-time calculations, safety norms, cost efficiency, material life time and labour availability, it can be concluded that the Mechanism that is suggested is the most

appropriate for detecting the level of bagasse in the silo. There are different methods of implementing level measuring processes among which are mechanical, capacitive, inductive, ultrasonic, acoustic, or optical. While mechanical and ultrasonic methods are mainly applied in level of solid materials. That most of these sensors exhibit some drawbacks such as low sensitivity, limited range, long-term instability, limited resolution, high cost and complicated manufacturing. Considering all these limitations of sensors we decided to use the ultrasonic sensor which very suitable and meets our requirement. Observing the current difficulties of bagasse level observation we overcome with our proposed work.

## REFERENCES

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- 2) IoT Based Smart Energy Meter from (IJTSRD).
- 3) Maintaining Pulp Consistency and Level in the Silo T.E. Ananthakumar 1, K.Aneshkumar 2, E.Sudhagar 3, S. Sundaramoorthi4. UG Scholar1, 2, 3, Assistant Professor4 Department of EIE Panimalar Engineering College, Chennai, India.

