

# Automation of Sugarcane Feeding System Using Wireless Sensor Network

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**Abstract:** To design the Automation of sugarcane feeding system (ASF) with the help of a sensor network. ASF system introduces the large-scale sugarcane stripper with automatic feeding. It contains the automatic feeding module, collecting module and control module. In this system when sugarcane is loaded to the feeder, it will start to shift the sugarcane from automatically feeder to conveyer. When the conveyer section reached maximum sugarcane weight then ASF system will automatically stop the feeder section at the same time when the conveyer section \have high amount of sugarcane, it will automatically slow down the transfer belt of the feeder section. ASF system is automatically control the feeding module and collecting module.

**Index Terms:** IR Sensor, ARM cortex, Weighing sensor, Motor, LCD Display, Alarm, Relay.

## I.INTRODUCTION

The current scenario in industries is to embrace new technologies to proceed towards automation. The same vision is exercised in Sugarcane filling plants. To meet the customer demands and accelerate the filling of Sugarcanes, all operations are nearly automated. The automation of Sugarcane filling involves use of PLC for control but it is costly. Despite of all such advance technologies small industries are still involved in manual filling of Sugarcanes. They might be discouraged to ad apt to new technology due to high cost involved in automation. The study emphasize on reduction in cost using ARM Processor. The ARM Processor is relatively cheap and widely available. In small industries Sugarcane filling operation is done manually. The manual filling process has many shortcomings like spilling of water while filling it in Sugarcane, equal quantity of water may not be filled, delay due to natural activities of human etc. This work generally emphases on small industries. It aims to eliminate problem faced by small scale Sugarcane filling system. With this system that operates automatically, every process can be smooth and the process of refilling can reduce the man power cost and operation time. The entire system is more flexible and time saving. The filling and capping operations are controlled using a programmable logic controller. This is because PLC'S are very flexible, space efficient and reduces complexity. Now industry using distributed control system method. In DCS method depend on manpower for feeding the sugarcane to the conveyer.

## EXISTING SYSTEM BLOCK DIAGRAM

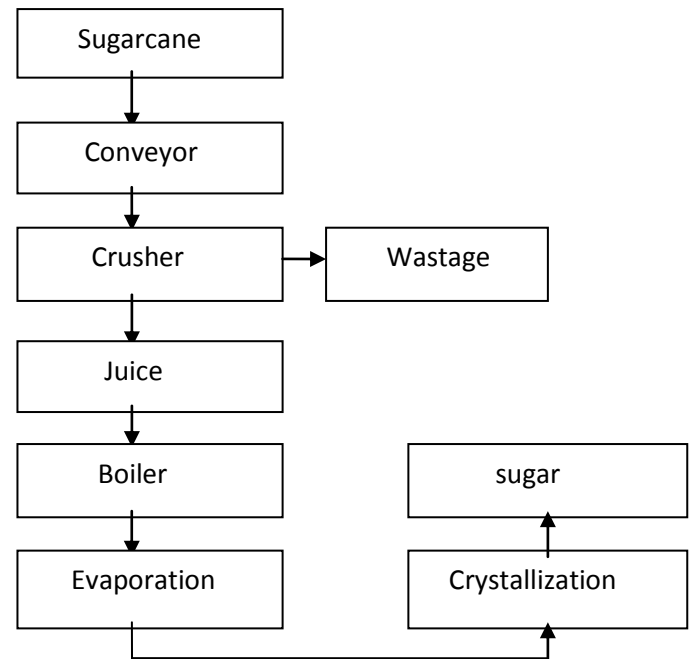


Fig: 1 Existing system block diagram.

Automation sugarcane feeding system for an industrial process using wireless sensor Network give high efficiency comparing distributed control system (DCS) method. Several components are used such as load cells, Weighing sensor, and Arm cortex.

## II.LITERATURE SURVEY

S.NO	METHODOLOGY	DISADVANTAGE
1	Microcontroller based Automation system using industrial std.SCADA	It has wire connection so, the process is complicated
2	Distributed Control System(DCS) method	Required man power, process time is high
3	Wireless sensor network in industrial automation	Power consumption is high

4	Automation of sugarcane feeding system using wireless sensor network	.....
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**III.METHODOLOGY**

The automatic feeding module use the mode of double-stage carding for the reason that the sugarcane were put together and placed out of order are disadvantage for automatic feeding. Figure 1 shows the automatic feeding equipment how to work. In short, carding wheel 5, 6 included some pieces for carding and did fixed-axis rotation that driven by the transmission mechanism. The conveyer2 do reciprocating motion to transfer the sugarcane. Sugarcane at the working platform 1, transferred to conveyer 2 after the carding wheel 6 carding. Next, the sugarcane to the limits of carding wheel 5 and carded. Then, the ordered sugarcane under the barrier plate transferred to the right region.

According the application the controller coordinates the automatic feeding module and the Conveyer module working together. The controller mainly control the feeding speed of automatic feeding unit, the rotation rate of the stripper wheel and the speed of collecting unit. We are controlling the whole system using PIC microcontroller with the help of PIC microcontroller, Weighing sensor, IR Sensor, Relay and Motor When sugarcane is loaded to the feeder it will transfer the sugarcane to conveyer section. When the conveyer section is loaded it wills automatically rotating the forward direction with the help of conveyer belt and motor.

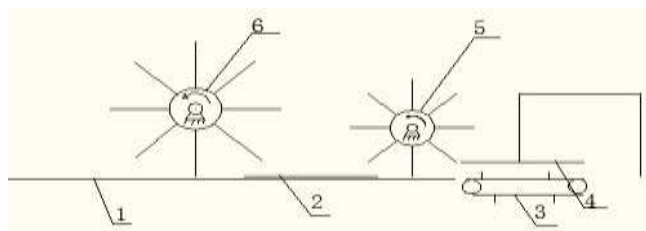
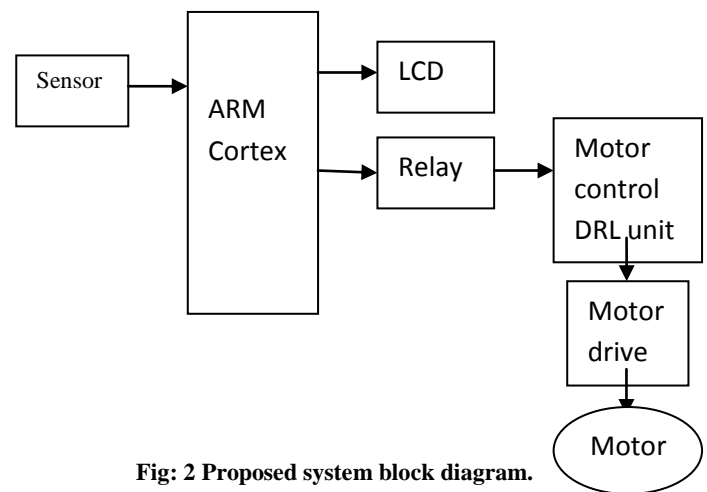


Fig. 1: The schematic diagram of the automatic feeding module, 1: Working platform; 2: Conveyer; 3: Transfer belt; 4: Barrier plate; 5: Carding wheel; 6: Carding wheel

When the weighing sensor detects the conveyer section is loaded maximum amount of weight microcontroller automatically throw the intimation Conveyer is overloaded at the same time it will slow down the feeder section also. In the conveyer section we have placed he IR sensor to find the maximum amount of sugarcane is loaded at the end of the conveyer section. When the IR Sensor detects the over loaded at the end of conveyer section it will automatically slow down the feeder section.

**Fig:2 PROPOSED SYSTEM BLOCK DIAGRAM**



**Fig: 2 Proposed system block diagram.**

Usage of weighing sensor for automatic functioning of the feeder through ARM cortex. A set of LCD's and Microcontroller are implemented to achieve automated functioning.

**IV.CONCLUSION**

This project is fully focused on the automation of process control and manufacturing industries using sensors. The sensors are having capacity of sense all kind of physical variations happening in the field. This project proposed a controlling and monitoring of cane feeding system in sugar industry in traditional manner. The demerits of classical approach has been overcome this project. The major advantages of this project are given below

- Labour safety
- Power consumption
- Minimization of process time
- Reducing cost factor
- Maximum utilization of sugar cane
- Easy trouble shooting

**REFERENCES**

- Dae-Man Han and Jae-Hyun lim, "Design and implementation of smart home energy management systems based on zigbee", IEEE Transactions on consumer Electronics, Vol.56, No.3, pp.1417-1425 August 2010.
- MA shu-guang, "construction of wireless fire Alarm system Based on ZigBee Technology", the fifth conference on performance-based fire and fire protection Engineering, Elsevier proceedings, pp.308-313, 2011
- Asutkar, Sachin More (2013), "Automated Sugarcane filling using microcontroller volume correction", International journal of engineering research and technology (IJERT). (Vol 2, Issue 3, march-2013).
- Rajesh G. Khatod, Chandrashekhar Sakhale(2012), "Design Fabrication of liquid dispensing machine using automatic control for engg. Industry", International journal of innovative technology and exploring engineering (IJITEE). (Vol I, Issue 5, October 2012).