

An Involuntary Feeding and Health Monitoring System for Dairy Farms

J. Thilagavathy¹, D. Frijit Raja Shunmathi², S. Janaki³, I. Jenifer⁴, M. Jeslin Mary⁵

Assistant Professor, Department of ECE, Dr. Sivanthi Aditanar College of Engineering, Tiruchendur, India¹

UG Final Year Students, Department of ECE, Dr. Sivanthi Aditanar College of Engineering, Tiruchendur, India^{2,3,4,5}

Abstract: The Involuntary feeding and health monitoring system for dairy farms ensures that there is always enough fresh feed with rich content of fat and protein along with good health condition and environment for animals. In large cattle farm provision of food is necessary. Nearly 80% of milk composition depends on feed. More research results that more frequent feeding results higher feed intake and higher production. The feeding system could not take care by workers all the time. The carelessness of the workers will makes the cattles to be hungry for a long time. So this can be prevented by implementing the involuntary feeding system as it provides the food at right time in a periodic manner and proper environmental and health management to preserve the animals. Quality of milk is necessary for every cattle. If the room/body temperature varied, the milk contents (fat & protein) gets changed. To maintain the constant temperature (39°C), temperature control system is used. The health monitoring system consists of RTC, GSM module which helps to remind the dairy farm owner about the periodical checkup of the cattles.

Keywords: Feeding System, Health monitoring system, GSM module, PIC Microcontroller, PIR sensor, LM35, Real Time clock.

I. INTRODUCTION

Today, more people around the world live in cities than in rural areas. The World Health Organisation estimates that by 2030, 6 out of every 10 people will live in a city, and by 2050, this proportion will increase to 7 out of 10 people. The explosive growth of cities and the rapid formation of a large global middle class mean that the consumption of value-added products such as dairy is set to increase dramatically over the next few decades.

Now a days the population of cattle get decreasing due to improper care and maintains by the human beings. As the dairy products plays an important role to our economy, we are going for involuntary feeding and health monitoring system for dairy farms to increase the productivity. More intake of carbohydrate leads to rich protein and fat level which will be of 0.2 - 0.3%. Since the frequent feeding increase the weight of cattles.

Feeding system is used to feed the food through the feed pump. For this system, stepper motor is used to feed the food and temperature control system is used to maintain the temperature at the range of 39 degree celsius. Automatic lighting system is turned on when PIR sensor detects the human interruption.

The health of the cattle should be maintained periodically for gaining quality milk. Thus, the health monitoring system is required for proper monitoring the dairy farms which is one of the most important system in our project that contains GSM module. The purpose of GSM module is to notify the dairy farm owner to remind the regular checkup of the cattles.

II. BLOCK DIAGRAM EXPLANATION

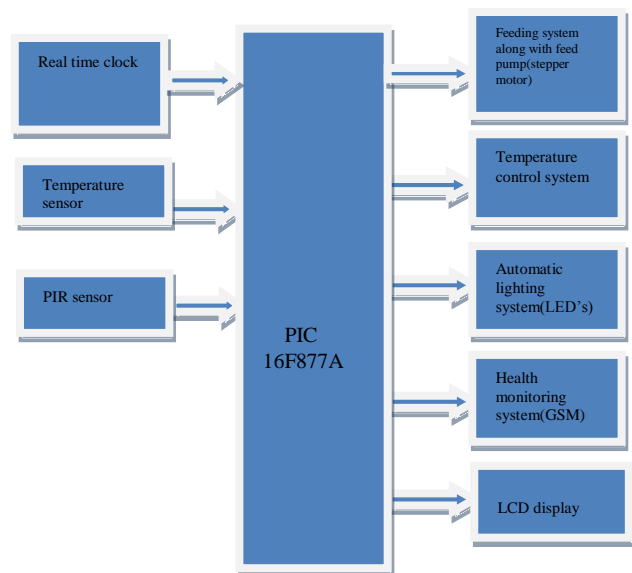


Fig 1: Block diagram

We are going for involuntary feeding system, in which feeding takes place through feeding pump which will contain both liquid and solid composition. During summer season most of the cattles suffer from low milk fat syndrome, in which the percentage of fat and protein composition get decreases and it result in poor production. To overcome this problem, a proper temperature should be maintained, that it should not exceed beyond 39°C, if it exceeds then the motor will start automatically and spray water to attain the desired



temperature. If there is any human presence in the cattle farm, PIR sensor will sense the human then the LED will glow in the automatic lighting system. The health of the cattle should be maintained periodically for gaining quality milk. Certain types of vaccines are given to the cattle during specific interval of time for preventing certain diseases, this can be automatically implemented by using GSM in which message will be sent to the owner and according to that vaccines are given to the cattle periodically.

III. FLOW CHART EXPLANATION

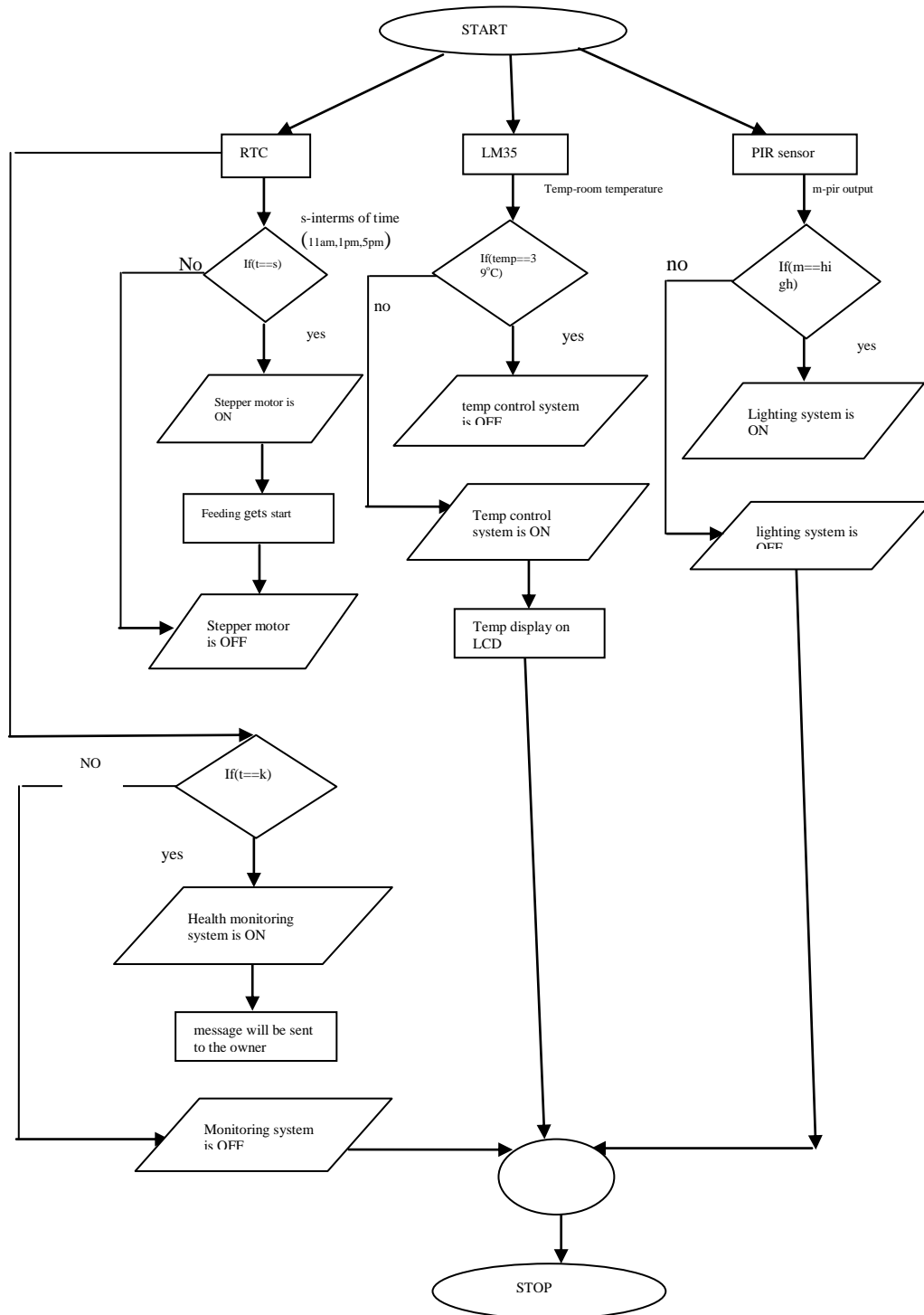


Fig 2: Flow chart



This flow chart shows the whole working of our project. The stepper motor will ON when the time $t = s$ (s-set time) and the feeding gets start. Health monitoring system gets ON and message will be sent to the owner when the date become same as the predefined date. The temperature should not exceed beyond 39°C , if it exceeds then the temperature control system gets ON. When the output of PIR sensor becomes high the lighting system will ON.

The LCD will display the output for current process. Here is the software simulation for LCD in proteus and it is used to display the time, temperature and date.

IV. CIRCUIT DIAGRAM

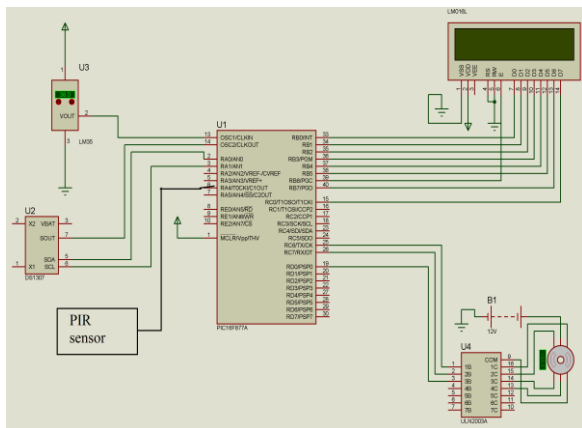


Fig 3: Circuit diagram of proposed system

V. PROJECT DESCRIPTION

The feeding get started in the dairy farms according to the time set by the real time clock system with the help of stepper motor through feeding pump. If there is any human interruption the PIR sensor senses and the LED will glow in the automatic lighting system. By implementing the temperature control system, a constant temperature will get maintained. For maintaining proper health and hygienic conditions, health monitoring system is implemented by GSM module.

VI. SOFTWARE IMPLEMENTATION

The software simulation is done in proteus, in which the program was run by mikro C software and the hex file was created and finally dumped to the PIC controller.

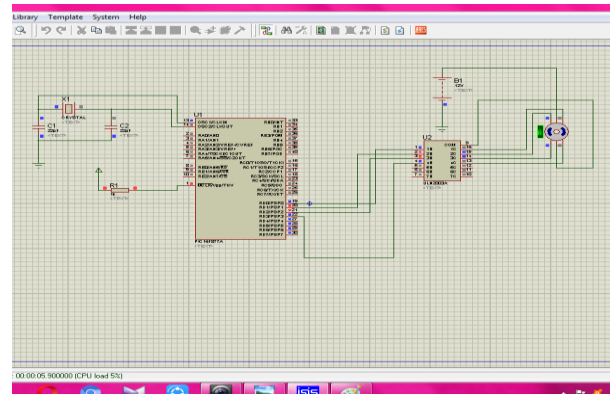


Fig 5: Simulation of stepper motor

A stepper motor is a brushless DC electric motor that divides a full rotation into a number of equal steps. By using a RTC, specific time is set and accordingly feeding process carried down using stepper motor control.

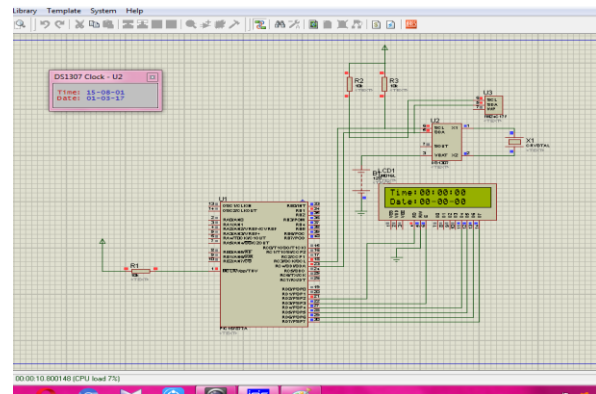


Fig 6: Simulation of RTC

A real time clock is a computer clock, usually in the form of an integrated circuit that is solely built for keeping time. Naturally, it counts hours, minutes, seconds, months, days and even years. According to the RTC, food feeding and health monitoring system is implemented.

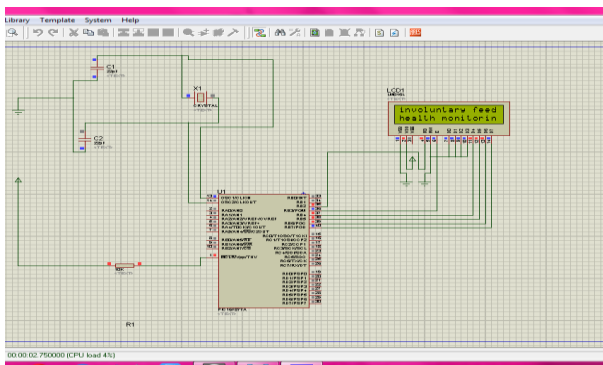


Fig 4: Simulation of LCD display

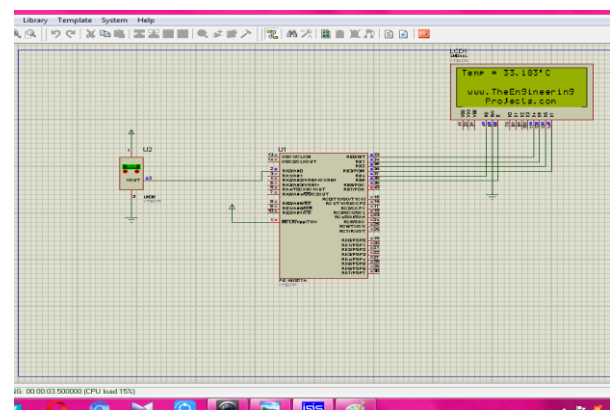


Fig 7: Simulation of LM35



IX. CONCLUSION

This proposed system provides an efficient way of maintaining the dairy farms. It provides an automatic feeding mechanism and health monitoring system for dairy farms and prevent the cattle from various diseases. It also helps us to provide the rich quality of milk with high portion and fats. Thus maintaining the purity of milk, which helps our nation to maintain highest place in milk production. This system is easy to handle, it also reduce the manual work, enhance the life of the farmer and provide health care for cattle.

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