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RESEARCH ARTICLE

IOT-BASED MEASURING TEMPERATURE AND HUMIDITY IN THE CATTLE DIARY

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ABSTRACT

Heat stress and imbalance of humidity causes cows to produce less milk with the same input, which effectively increases farmer's production costs and produce low economy. Around the global heat stress causes an impact on dairy productivity. In diary industry, the cattle diary temperature and humidity are measured and appropriate measures are implemented so that the impact of temperature and humidity can be maintained constant. The U.S department of agriculture estimates nearly 2.4 billion a year in losses from animal illness that lead to death can be prevented by maintaining constant temperature and humidity in cattle diary. This research paper recommends measures on sensing temperature and humidity using DHT11 sensor to maintain constant range to increase the yield with high quality of milk and prevent cattle from death. The proposed system will measure temperature and humidity and also reduce heat stress using misting systems. The results of proposed system can be viewed and stored in the web server on interfacing Wi-Fi shield.

INTRODUCTION

Dairy cows are homoeothermic animals and needed to maintain a constant body temperature. They are sensitive to factors which influence their thermal exchange within the environment. These factors include temperature of air, radiant directly influence the heat exchange ability of the animal. Humidity can decrease heat exchange and have debilitating effects on the cow.

Heat stress leads cattle to produce less milk with same nutritional intake which effectively increases farmer's costs. Heat stress provides low quality of milk as such as protein and fat content of milk. Higher temperature will also leads to death. Farmers will suffer from this situation because of costs(1). The comfort Zone or thermos neutral zone for a diary cow is between 5°C and 25° C. 5° C is called the Lower Critical Temperature (LCT) and 25° C the Upper Critical Temperature (UCT).the temperature below the LCT the cow will increase the dry matter intake to keep warm or convert feed to heat rather than produce milk. At temperature above the UCT cows have two main control strategies to maintain their thermal balance (i) increasing hest dispersion and (ii) limiting heat production-both will reduce the milk productivity. The danger occurs as the temperature range as 100° F and 50 % humidity. The lethal range for cattle is 100V F and 80 percent humidity.

The systematic electronic monitoring of cattle can be achieved with the help of connected smart internet enabled sensor objects Internet of Things (IoT). Its major contribution is its proposed innovative solution that is based on DHT11 sensor (Temperature and humidity). DHT11 sensor will sense the temperature and humidity range and give the values to the web server through Wi-Fi shield(3).

Understanding Iot For Cattle Diary

Internet Of Things

Gartner research states that the Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense interact with objects or the external environment or interact with all objects(2). IBM states that the Internet of things represents which objects are capable of interacting with other objects. Hospitals can monitor, store and regulate pacemakers long distance and also view the patients details, factories can automatically address production line issues like fir accident(5). This paper deals with the cattle diary which measure temperature and humidity and will store the values in web server.

Temperature And Humidity Sensor

DHT11 element is calibrated in the laboratory that is extremely accurate on humidity and temperature calibration(6). The calibration coefficients are stored as programmes in the sensor

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using internal signal to detect. System integration was quick and easy using single wire serial interface. It consumes low power and size is low and signal transmission is possible up to 20 meter. The component is 4-pin single row pin package and overall specification is specified. It is easy to connect to the packages of user's need

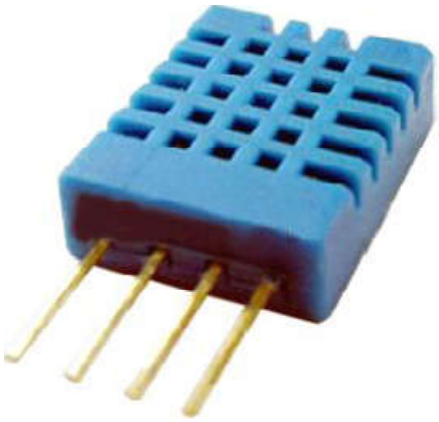

Fig 1 DHT11 Sensor

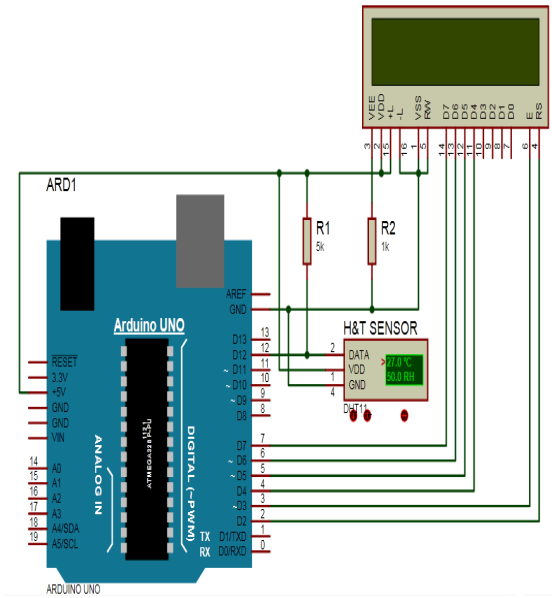

Fig 3 Circuit Diagram Of Measuring Temperature and humidity

When MCU is connected with DHT11 sensor it sends a signal, DHT11 levels are chases as changes from the low-power-consumption mode to the running-mode until MCU complete the start signal. After completion of received signal, DHT11 sends a response signal of 40-bit data that include the relative humidity and temperature (7); information data to MCU to produce wave.

unit package. Prototyping included design, manufacturing and assembly of circuit boards for a sensor, arduino, LCD display and developing software for the embedded system and LCD to display humidity and temperature values. The block diagram of the measuring humidity and temperature is illustrated. For prototyping purpose, Arduino is utilized as the core for DHT11 (temperature and humidity) (8) sensor to benefits as sensing,

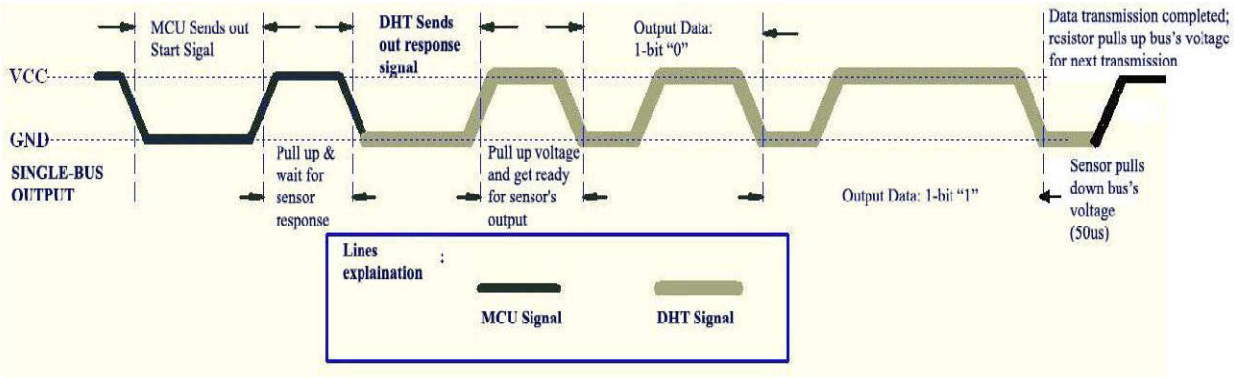

Fig 2 Overall Communication Process

System Design And Overview

Arduino

Arduino is an open source platform for electronic projects. Arduino consists of physical and logical components as programmable circuit board and software, protocols and add DHT11 library to Arduino software and upload the code. The Arduino platform was very easy to implement and become quite popular with easier program version of C, C++ and to learn program easily.

Like embedded systems, Arduino interacts with hardware and software to produce output values. Users can collect (read) some data. DHT11 will response the signal from MCU only it sends a start signal and then changes occur as to low power consumption mode whet it receives the signal. Finally, Arduino deals a standard factor that breaks the factor of micro controller

processing and communication features. The output will be displayed in 16x2 dimensions. The values are stored in the web server which is meanly called as cloud storage and can be retrieved or check the values when we needed it (9).

Software development is based with embedded systems the design are connected (10).

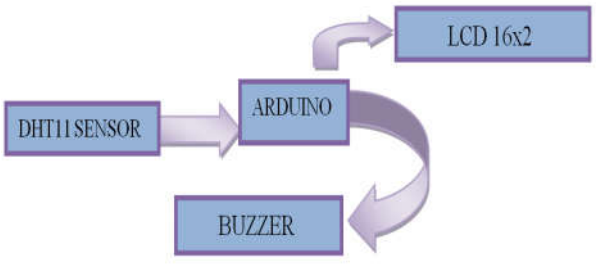

Fig 4 block diagram of displaying value of temperature and humidity

CONCLUSION AND FUTURE WORK

This paper presented an approach to deal with addressing the critical needs of dairy industry. While maintaining constant temperature and humidity dairy will yield huge operational efficiencies, cost savings. Our future work will reduce the heat stress in a diary and also prevent cattle from death. The values are stored in a web server and can be viewed at anytime.

References

1. Anitha Ilapakurti & Chandrasekar Vuppalapati, "Building an IoT Framework for Connected Dairy", In 2015 IEEE First International Conference on Big Data Computing Service and Applications (Big Data Service), pp. 275-285, 2015.
2. Hetal B. Pandya & Tushar A. Champaneria, "Internet of things: Survey and case studies." In 2015 International Conference on Electrical, Electronics, Signals, Communication and Optimization (EESCO) ,pp. 1-6. 2015.
3. Patrick Kibambe Mashoko Nkwari, S. Rimer, B. S. Paul & H. Ferreira, 'Heterogeneous wireless network based on Wi-Fi and Zig Bee for cattle monitoring", In IST-Africa Conference, pp. 1-9, 2015.
4. M. H. Ariff, I. Ismarani & N. Shamsuddin, 'RFID based systematic livestock health management system", In 2014 IEEE Conference on Systems, Process and Control (ICSPC), pp. 111-116, 2014.
5. Chao- Hsi Huang, Pin-Yin Shen & Yueh-Cheng Huang, 'IoT Based physiological And Environmental Monitoring System In Animal Shelter", In Seventh International Conference on Ubiquitous and Future Networks (ICUFN), pp. 317 – 322, 2015.
6. Adit Junchun, Yu Decharat, Marc Boers, Göran Stemme & Frank Niklaus, 'Room-temperature sealing of micro-cavities by cold metal welding', Journal of Micro-electromechanical Systems, vol 18, no. 6, pp: 1318-1325, 2009.
7. J. E. Legates, B. R. Farthing, R. B. Casady, and M. S. Barrada. "Body temperature and respiratory rate of lactating dairy cattle under field and chamber conditions." Journal of dairy science 74, no. 8, pp: 2491-2500, 1991.
8. Jon Marcus."How cows are becoming smart connected products", IEEE Micro-electrochemical systems, June 2014.
9. Abi Grogan, 'Internal smart pill to save the dairy industry', International conference on ICFUN-IEEE 2014.
10. Michael E. Porter & James E. Heppelmann, 'How smart, connected products are transforming competition', Harvard Business Review vol 92, no. 11, pp: 11-64, 2014.

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