

# **Zigbee Based Health Monitoring & Feedback System in Animal Health Care**

Rajshree S. Thakre, Prof. Vidya Bodhe

M.E (Wireless Communication and Computing), ABHA Gaikwad-Patil College of Engineering, Nagpur,  
Maharashtra, India

Assistant Professor, Dept. CSE-IT, ABHA Gaikwad-Patil College of Engineering, Nagpur, Maharashtra, India

**ABSTRACT:** Care of critically ill Animal, requires spontaneous & accurate decisions so that life protecting & lifesaving therapy can be properly applied. Statistics reveal that every minute a human is losing his/her life across the globe. More close in India, everyday many lives are affected by heart attacks and more importantly because the Animals did not get timely and proper help .This paper is based on monitoring of Animals. We have designed and developed a reliable, energy efficient Animal monitoring system. It is able to send parameters of Animal in real time. It enables the doctors to monitor Animal health parameters in real time. Here the parameters of Animal are measured continuously and wirelessly transmitted using Zigbee. The project provides a solution for enhancing the reliability and flexibility by improving the performance and Animal monitoring system. In the current proposed system the Animal health is continuously monitored and the acquired data is analyzed at a centralized system. If a particular Animal health parameter falls below the threshold value, an automated SMS is sent to the prefigured mobile number using a standard GSM module interfaced to the System. Here, we are using Zigbee for wireless transmission. The Doctor can get are cord of a particular information by just accessing the database of the Animal on his PC which is continuously updated through Zigbee receiver module.

**KEYWORDS:** Automated SMS, Wirelessly Transmitted, Zigbee.

## **I. INTRODUCTION**

In recently, wireless sensor networks are used to structure Remote care system in many researches. Wireless sensor networks application for physiological signals communication transmission has many technologies. Such as the ZigBee, used for physiological signal transmission. Although ZigBee has lower power consumption. Hence, ZigBee is used for 24 hours monitor of communication transmission systems. ZigBee provides higher network flexibility and a larger number of nodes, and a better transmission range with low power consumption. Large number of nodes enables the expansion of such systems. Recently, ZigBee based wireless networks were check in various applications. The proposed Animal monitoring system would be beneficial for medical practitioners to do proper and treatment; also it would be useful for health care providers to improve disease management. The Animal is monitored the data transferred to the PC is wired. Recent work [1,2] includes using Bluetooth technology coupled with the GSM technology to report signs to PDAs held by the Animal or his doctor.

# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 6, Special Issue 11, May 2017

## II. DESCRIPTION OF THE PROPOSED WORK

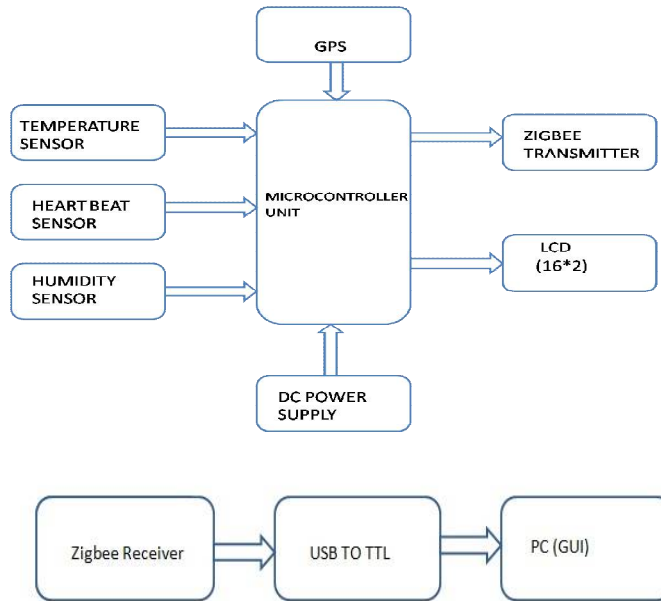


Fig: Block diagram of proposed system

## III. CIRCUIT DIAGRAM

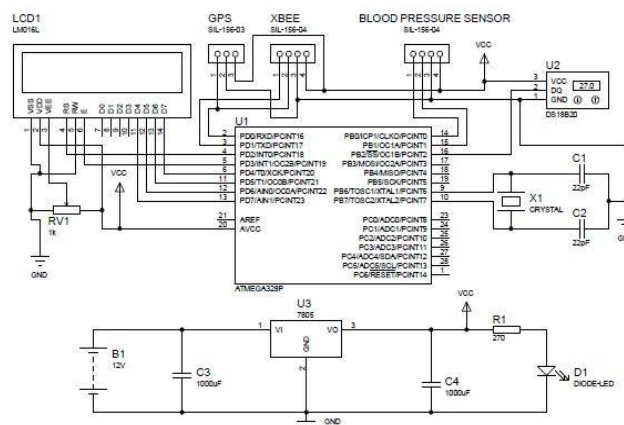


Fig: Circuit Diagram

## IV. WORKING

The surrounding temperature and relative humidity based real time calculation of temperature humidity index (THI) and also has been classify the stress level of the animal. The output signal of the developed sensor modules are sent to a host computer through zigbee module. The values of body

## International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 6, Special Issue 11, May 2017

Temperature, surrounding humidity, surrounding temperature, rumination, heart rate, stress level, and THI index (THI) can be displayed on the GUI PC. The design of system is an autonomous device, if you need the monitoring of other health parameter which makes it comparatively easy to add extra sensor modules.

The sink module is used to collect data from different sensor modules. The developed sink module consists of zigbee coordinator and graphical user interface running on PC. The transceiver unit is the main device of the zigbee coordinator and the transceiver unit is serially interfaced to the microcontroller. The microcontroller is serially interfaced to the PC through USB. The serial data converses depend on the UART.

The front panel of the system handles functions of themeasuring parameters such as settings the time interval, startbutton (ON), OFF, data saves for the access memory of the PCor in the data base, and a digital and a graphical output. Herethe developed GUI module can perform for four sensingmodule and display the seven valuable physiological andbehavioral parameters. The USB slot of the PC is present the100mA at 5V and it does not require any external powersource in the sink module during the experiments. The powerconsumptions in the AHM system is depend only on thewireless sensing modules. During experiment, the 11.1Vbattery (rated 350mAh) is used. The system has been developed ergonomically with thereference of the animal, the veterinary staff and primary userof the device. The following points are followedby thedesigning of the system in terms of the reduction ofenvironmental factors, such as, the module is protectivecovering of PVC (Polyvinyl chloride) to shield it from rainand insects as well as the design of the casing for the collar tobe threaded through, minimum noise is achieved in the case ofthe developed multilayer circuit board which includes a ground plane, and sensor and its associated Circuitry areconnected through wires with grounding Connection.

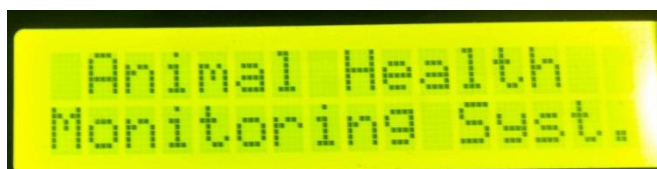
### V. RESULTS

Setup of project is shown below which allow us to take the final results for this research work,



**Fig: Project Setup**

At the start of the system, the display glows and displays as follows,



**Fig: LCD at Start up**

After connecting the sensors on the cattle's body it will give the body temperature, respiration, heart Beat and blood pressure. Using this values we can observe the body issues of the cattle and we can detect by which disease cattle's are suffering. The screenshots of graphs are shown below.

## International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 6, Special Issue 11, May 2017



**Fig: Result Window**



**Fig: Results on LCD**

The results are fully satisfied and give completely correct results when compare with the conventional systems.

### VI. CONCLUSIONS

In order to overcome various health issues and problem related to animal, we have proposed a smart animal health monitoring system. This system consists of various sensor modules which will help to improve the animal health and their various problems. The system will be useful for testing real time monitoring of body temperature, rumination and heart rate as well as surrounding temperature. This system also uses Zigbee for the implementation of animal's health.

### REFERENCES

- [1] Anushka Patii, Chetana Pawar Neha Patii, Rohini Tambe Smart Health Monitoring System for Animals by in 978-1-4673-7910-6/15/\$31.00 ©2015 IEEE
- [2] A. Kumar and G.P. Hancke, Senior Member, IEEE A Zigbee-Based Animal Health Monitoring System 10.1109/JSEN.2015.2349073, IEEE 2015.
- [3] Ankit Bhavsar, and Harshal Arolkar ZigBee Based Network Architecture for Animal Health Monitoring in 2015 1st International Conference on Next Generation Computing Technologies (NGCT-2015) Dehradun, India, 4-5 2015
- [4] Congguo MA, Yeqin WANG, Genwang YING The Pig Breeding Management System Based on RFID and WSN in 2011 Fourth International Conference on Information and Computing
- [5] Kevin Smith, Angel Martinez, Roland Craddolph, Howard Erickson, Daniel Andresen, and Steve Warren An Integrated Cattle Health Monitoring System in Proceedings of the 28th IEEE EMBS Annual International Conference New York City, USA, Aug 30-Sept 3, 2006
- [6] T. K. Hamrita, E. W. Tollner, and R. L. Schafer, "Towards fulfilling the robotic farming vision: advances in sensor and controllers for agriculture applications," IEEE Trans. Industry Appl., vol. 36, no. 4, pp. 1026-1032, 2000.
- [7] Y. Kim, R. G. Evans, and W. M. Iversen, "Remote sensing and control of an irrigation system using a distributed wireless sensor network," IEEE Trans. Instrum. Meas., vol. 57, No. 7, pp. 1379-1387, 2008.
- [8] K. Smith, A. Martinez, R. Craddolph, H. Erickson, D. Andersen, and S. Warren, "An integrated cattle health monitoring system," IEEE Proceedings of EMBS Annual Int. Conf., New York, USA, Aug. 30-Sep. 3, pp. 4659-4662, 2006.
- [9] T. T. Mottram and N. J. Bell, "A novel method of monitoring mobility of dairy cows," The First North American Conf. on Precision Dairy management 2010, Minnesota, USA.

## International Journal of Innovative Research in Science, Engineering and Technology

*(An ISO 3297: 2007 Certified Organization)*

**Vol. 6, Special Issue 11, May 2017**

- [10] M. Janzekovic, P. Vindis, D. Stajko, and M. Brus, "Polar sport tester for cattle heart rate measurements," *Advanced Knowledge Application in Practice*, Ch-9, pp. 157-172, Edited by Lgor Fuerstner, Publisher –Sciyo, Nov. 2010. (ISBN:978-953-307-141-1)
- [11] B. Wietrzyk and M. Radenkovic, "Enabling large scale ad hoc animal welfare monitoring," in *5 th Int. Conf. on Wireless and Mobile Communication (ICWMC 2009)*, Cannes/La Bocca, French Riviera, France, IEEE Computer Society, 2009.
- [12] B. Wietrzyk, M. Radenkovic, and I. Kostadinov, "practical MANETs for pervasive cattle monitoring," in *Proc. of the 7 th Int. Conf. on Networking*, Cancun, Mexico, 2008.
- [13] M. Radenkovic and T. Lodge, "Engaging the public through mass scale multimedia networks," *IEEE Multimedia*, vol. 13, no. 3, pp. 12-15, 2006.
- [14] H. Hopster and H. J. Blokhuis, "Validation of a heart-rate monitor for measuring a stress response in dairy cows," *Canadian J. of Animal Sci.*, pp. 465-474, 1994.
- [15] Y. Guo, P. Corke, G. Poulton, T. Wark, G. B. Hurley, and D. Swain, "Animal behavior understanding using wireless sensor networks," *IEEE Int. Conf.*, ISBN:1-4244-0419-3, pp. 607-614, 2006.
- [16] E. S. Nadimi, R. N. Jorgensen, V.B. Vidal, and S. Christensen, "Monitoring and classifying animal behavior using zigbee based mobile ad hoc wireless sensor networks and artificial neural networks," *Computers and Electronics in Agriculture*, vol. 82, pp. 44-54, 2012.
- [17] E. S. Nadimi, H. T. Sogaard, T. Bak, and F. W. Oudshoorn, "Zigbeebased wireless sensor networks for monitoring animal presence and pasture time in a strip of new grass," *Computers and Electronics in Agriculture*, vol. 61, pp. 79-87, 2008.