"Review of Dynamic Wireless Sensors Networks for Real Time Safeguard of Workers"

Miss. Sneha. D. Kharade[1], Miss. Sneha. M. Patil[2]

Student -Bachelor of Engineering , Electronics & Telecommunication Engineering Department, Dr. Daulatrao Aher College of Engineering, Karad , Maharashtra, India[1]

Assistant Professor, Electronics & Telecommunication Engineering Department, Dr. Daulatrao Aher College of Engineering, Karad, Maharashtra[2]

Abstract: Now a days, difficult task for construction sites is to track workers spread out across a large construction areas. It becomes more difficult when construction site collapse. Many sites use radio system but to overcome the demerits of radio system we are using wireless technology for tracking of workers. A location and tracking system is very important for sefty in future. For accurate location information is being used these system in the construction site. We have to implement an accurate location tracking mechanism using Zigbee with providing information of changes in atmosphere. The system can be applied outdoors especially in big construction sites for avoiding accidents. Wireless sensor networks have been developed widely. Sensor networks has sensor nodes which are very small size and low cost. One of the critical wireless sensor network applications is localization and tracking mobile sensor nodes. ZigBee is a new n rising technology for low rate, low power and low range communication networks, which aims to provide long battery life for network devices. The communication of transreceiver with base stations is through Zigbee module. We also include sensors such as temperature, vibration and humidity to intimate the base station and workers when some atmosphere changes occur. We are using real time system for continuous monitoring purpose.

Keywords: Wireless sensor network, Zig.ee, Sensors, Tracking.

I. INTRODUCTION

Constructions in cities are developing rapidly but precaution for safety of workers is negligible. It is a one of the major problem on construction sites. Workers are exposed to many dangerous environmental changes which increase the risk of their life. Construction workers are the largest group of service providers in city. Majority of workers from urban area are poor which are employed in building and construction industry. Health of workers gives direct impact on their potential due to which productivity loss occur at construction sites. The people at construction site face several problem such as collapse buildings due to earthquake or some other difficulties, sometimes there should be problem due to high temperature or humidity. To prevent all these problems faced by workers in construction site. Wireless Sensor Network (WSN) used to monitor physical or ZigBee is nothing but a communication protocol for wireless networks used to transmit or receive information between two or more nodes. All information is displayed on 2X16 LCD display. Real time clock is additional feature through which system provides real time output which is main purpose of this project.

environmental conditions, such as temperature, humidity, vibration etc.We proposed a project to measure temperature, humidity, vibration by using different sensors. The data related to all workers are transmitted to PC by using ZigBee module

II. SYSTEM DESIGN

These system we are going to implement on helmet of workers this helmet called as smart helmet. System mainly consists of controller, ZigBee, battery, display and different types of sensors such as temperature Sensor, humidity sensor and vibration sensor. In this vibration sensor will be used to detect vibrations. When there are continuous vibrations on respected construction site. Temperature sensor is used to detect the level of temperature from atmosphere. Also humidity sensor will be used to detect moisture in atmosphere and humidity sensor used when there is dampness in air the sensor will sense that change.
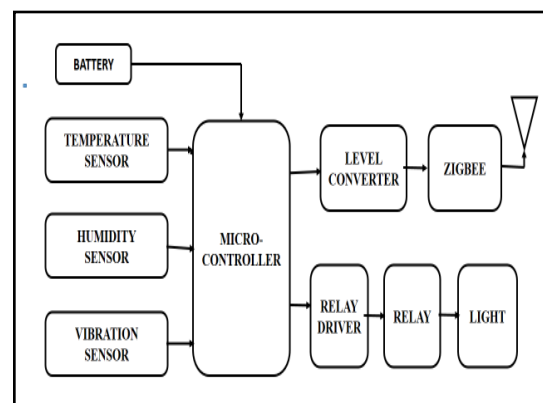

Fig 2.1 Transmitter section

Vibration sensor used to sense vibration during earthquake and other environmental changes, humidity sensor used when there is dampness in air the sensor will sense that change.
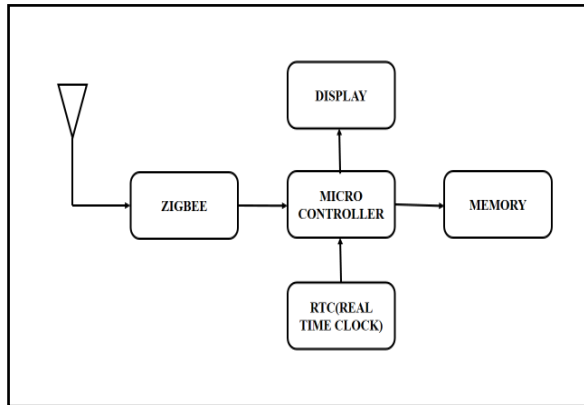

Fig 2.2 Receiver section

III. SYSTEM COMPONENT DESCRIPTION

A. Microcontroller-

We uses AT89S52 because of that features maximum speed execution of instruction per cycle is 0.5. The AT89S51 is a low-power, high-performance and most efficiency CMOS 8-bit microcontroller with 4K bytes of in-system programmable Flash memory. This device is manufactured using Atmel's high-density non-volatile memory technology and is compatible with the industry-standard 80C51 instruction set as well as pin out. The on-chip Flash allows the program memory to be reprogrammed in-system. AT89S52 has an inbuilt UART for serial communication.

B. Zigbee-

we uses Two ZigBee networks are used that is. one for transmission purpose and other ZigBee for receiving purpose. Zigbee is a low price, low power, mostly short distance wireless communication technology that is great for many advance wireless applications.

ZigBee was created in order to fill a wide in the area of wireless monitoring and control for different commercial applications. Other system like 802.11b and Bluetooth either wastes a large amount of power or are overly complicated for simple automation tasks. ZigBee allows small devices like sensors to operate efficiently while providing all necessary functionality for the specific application in which it is deployed.

Fig.3.1 Zigbee Model

C. Temperature sensor-

We use LM35 precision Centigrade Sensors. Output voltage of this sensor is linearly proportional to the Celsius (Centigrade) temperature. LM35 doesn't require any external calibration or trimming to provide typical accuracies of $\pm1/4°C$ at one room temperature and $\pm3/4°C$ over a full -55 to +150°C temperature range.

D. Humidity sensor-

The Humidity is one of the most commonly measured physical quantities and is of great importance in commercial as well as industrial applications, Humidity is defined as a measure of the water vapour present in an air. Operates at rang of 20-95%RH and temperature 0-60Celsius also operating frequency 500Hz-2 kHz.

E. Vibration Sensor-

We use vibration The vibration / shock sensor detects shock and continuous vibration due to environmental changes. The shock levels and monitoring durations can be set as for each individual sensor.

F. Real Time Clock (RTC)-

The Real time clock used in integrated circuits. RTC completely manages functions like Real-Time Clock counts seconds, minutes, hours, date of the month, month, day of the week, and year, with leap-year compensation valid up to 2100. Accuracy of the RTC is $\pm2ppm$ from 0°C to +40°C, $\pm3.5ppm$ from -40°C to +85°C. Used in device like microcontroller, PC and many devices

.G. LCD (Liquid Crystal Display)-

The LCD screen is an electronic display module and found in wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits.

IV. CONCLUSION

In this system we are going to use dynamic wireless sensors due to which we will easily track the location of workers on real time. This system not only provides security for workers but also gives information about earthquake or natural disasters, transferring the information to monitoring center by quicker communication network. Overhead temperature and continuous vibration sensing system using ZigBee based wireless sensor network will develop and successfully implement. It is reliable system with quick and easy installation.

REFERENCES

1. Kothandam A1 Suganya A2, "Monitoring and Protection of Real Time Safeguard of Workers Exposed to Physical Agents in Construction Sites through Dynamic WSN", International Journal for Scientific Research & Development| Vol. 3, Issue 04, 2015
2. Mrs.G.Bhavani, S.Shamiya, P.Santha, P.Sivaranjini,

"Safeguard of workers exposed to physical agents in construction sites using WSN", International journal of engineering sciences and research technology.[Bhavani, 4(4): April, 2015]

3. Shiksha Singh and Deependra Pandey, "Wireless Sensor Network based Resource Tracking System for the Safety of Workers Exposed to Physical Agents while constructing or demolishing any Building", International Journal of Current Engineering and Technology. Vol.6, No.1 (Feb 2016)

4. G.M. Kumari and Dr V Devi, "Real Time Automation and Monitoring System for Modernized Agriculture", International Journal of Review & Research in Applied Sciences and Engineering vol.3, March 2013.

5. Manoj Kolam & S. R. B. Shree Shree, "Zigbee Wireless Sensor Network for Better Interactive Industrial Automation", IEEE, 2011.6.

6. J. Akerberg et al, "Future Research Challenges in Wireless Sensor and Actuator Networks targeting Industrial Automation ", IEEE, 2011.

7. M. R. Reddy et al. "Touchscreen and Zigbee based Wireless Communication Assistant", International Journal of Combined Research and Development vol.1, Issue 4, August 2013.

8. Elisa Pievanelli et al, "Dynamic Wireless Sensor Networks for Real Time Safeguard of workers exposed to physical agents in construction sites", IEEE, 2013.

9. M. R. Reddy et al, "Touchscreen and Zigbee based Wireless Communication Assistant", International Journal of Combined Research and Development vol.1, Issue 4, August 2013.

10. T. Zwavashe, "A Zigbee Based Inter-Processor Communication Architecture for the Management of Bedchambers for the Physically Challenged", International Journal of Innovative Research in Computer and Communication Engineering, vol2, issue4, April 2014.

11. T. Zwavashe and R. Duri, "Integrating GSM and Zigbee Wireless Networks for Smart A2 farming Enterprises in Zimbabwe", International Journal of Science and Research, Vol3, Issue6, June 2014

12. T. Zwavashe, "Polling, Interrupts & μCOS-II: A Comparative Timing Response Simulation Model for Wireless Processor-to-Processor Communication", International Journal of Science and Research, Issue3 vol7, July 2014.