

Feasibility of energy harvesting methodology for wearable devices in health monitoring system

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Abstract—These days, Sensors are playing very important role in the world with combination of Wireless Technology. Wireless Sensor System makes the human life simpler and smarter. This emerging Technology helps in Industrial Applications .Safety and Security standards to employee position observation and industrial premises monitoring is also important towards safety Industrials. In this paper we are introducing advanced sensor system called Wearable Wireless Sensor System. It is the combination of Wireless Sensors and Wearable Technology for significant safety enhancement in Industrials. We built up a wearable wireless sensor framework which is appended in a consistent wearable format & utilized to work environment observation. Wireless Sensors are temperature, smoke sensor and LPG Gas sensor. The fundamental element of designed framework is likelihood could be actuated wirelessly through a

RF module with radio signal at a frequency of 850MHz to 865MHz .It performs different wearable sensing module framework, for example, changing the framework from rest, estimation, and information transmission modes when outside RF sign is accessible. The exploratory information exhibit that the actuation separation distance is 2.8 m to a RF module with an intensity of 28 dBm. Advanced Wearable System framework can signalize about worker nearness in connection to offices. If any alert through high temperature, smoke or gas leakage RF wireless module alert us through buzzer and we control the same thing through Wireless Technology. All info and out modules are interfaced to ARDUINO Microcontroller with procedure input information and furnish yield with assistance of 5V controlled power supply. In this task we utilized Arduino ide programming to compose c program and accumulating.

Index Term: Arduino, LPG, Smoke, RF, Wearable Wireless Sensor.

I. INTRODUCTION

Present day level of hardware and datainnovation permits fusing electronic parts

legitimately into work garbs or regular citizen garments without carrying a bodily distress towards the wear. The wireless

innovation furnishes dressable gadgets with RF association, additionally this is an association with significant system administrations for capacity and handling information of each wearer. This innovation additionally gives remote observing element, the information of dressable could be detected by equipped staff distantly and connection to elements of dressable gadgets is done. There are great deals of calling in industry and administration parts which are influenced by various risks. Simultaneously, the security benchmarks for modern plants become harder as for representative state observing and checking of working ecological conditions. Along these lines, it is important to give ongoing wireless observing of both worker state and working environment natural conditions. Different kinds of Wireless Sensor Networks(WSN) have been grown as of late. These systems comprises of little hubs and are furnished with handsets, chip and sensors. They can be utilized in various everyday issues such as ecological , human checking, home computerization and so on. With the help of proposed system, advanced safety and security in Industrial Applications is new era in present and also the employee safety and monitor is observed wirelessly through this system.

2. LITERATURE OVERVIEW

Writing Survey to neutralize the perilous impacts of gas spillage, critical endeavors was completed in manipulative and scaling down the gas break locating procedure. The events of gas release related occurrences are contemplated by a few analysts and have distributed factual information episodes. In 2012, Some vital detailed "Vitality Aware Gas Sensing Using Wireless Sensor Networks" concentrating on a sensor hub, hand-off hub, remote sensor system and a system organizer [1]. System organizer is a principle element of WSN. Bolsters a system activity correspondence dependent on the IEEE 802.15.4 standard and the ZigBee determinations. The system organizer is additionally in charge of alarming a system administrator or a crisis administration utilizing the internet system or alerting a SMS using GSM modem. Indeed, after accepting the alarm with the sensor hub, a system facilitator be able to carry out the primary oppose activity by switching off harmful gas emanation by means of the remote sensors.

Similar creators have additionally added to the additional vehicle security through a truck lodge , air excellence screen utilizing CO & O₂ gas modules , framework structured is created and on-street tried. The consistent observing gases of CO

& O₂ gives included vehicle wellbeing acaution and can be put off perilous gas focuses, driver's weariness / sleepiness and Fumes hazardous gas result suicides. CO groupings of 30 ppm & O₂ gas levels less than 19% practiced when driving. A "GSM Based Gas spillage Detection System" by Srivastava and Prabhukar gives a practical and profoundly precise framework, which distinguishes the gas spillage as well as caution , mood killer the main power and gas supplies and sends a SMS. Ramada and Palaniappen detailed an "Implanted System for Hazardous Gas Detection and Alerting". The cautioning of gas spillage is through buzzer and SMS. A "WSN based Smart System for Detection of LPG and Combustible Gases" has been proposed by Hemiactal [2], which distinguishes possibly unsafe gas spill inside a zone by methods for different sensors based electronic frameworks. These frameworks additionally utilize a discernible caution to alarm the individuals at whatever point a perilous gas is distinguished. These gas has10 identification framework which is enormous helpful , these frameworks are able to utilized to distinguish a broad scope of burnable, combustible & poisonous gases which effectively affect human wellbeing . "Plan Implementation of an Economic Gas Leakage Detector" [3] by

Mahalingam gave the financially savvy broad media answer for LPG spillage discovery in homes and business environment and perceptibly alert the clients in the event of a perilous circumstance & give cautioning signal (blares).

3. PROPOSED SYSTEM

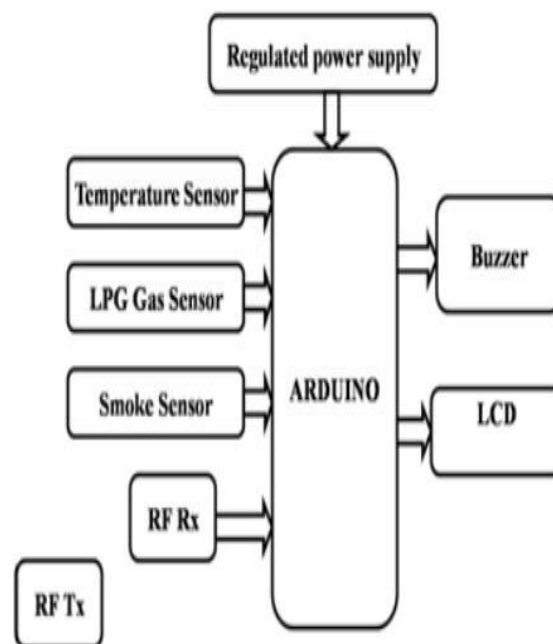


Fig. 1. Block diagram

In the proposed system we introduced a wearable sensor framework which is assigned for checking natural consideration and giving representatives to wellbeing unsafe enterprises, for industrials. In this present wearable framework we are utilizing Temperature, LPG Gas and Smoke sensors which constantly screen the information and if any crisis condition occur it offer alarm to verify worker and work place. In this paper

we are utilizing RF framework by which we can control gadgets remotely to screen the nearness of the worker. The wearable framework proposed in this work, gives information gathering and guarantees staff security. If there should arise alerts in the remote initiation area, association with WSN set up. With this framework time utilization, Power utilization is low and because recently more harm happening to maintain a strategic distance from and secure worker and work place we are presenting Wireless Sensors which are savvy, low power and quick. The proposed framework expands the security of representatives at mechanical offices by giving an ongoing checking of gas fixation, which for our situation is methane.

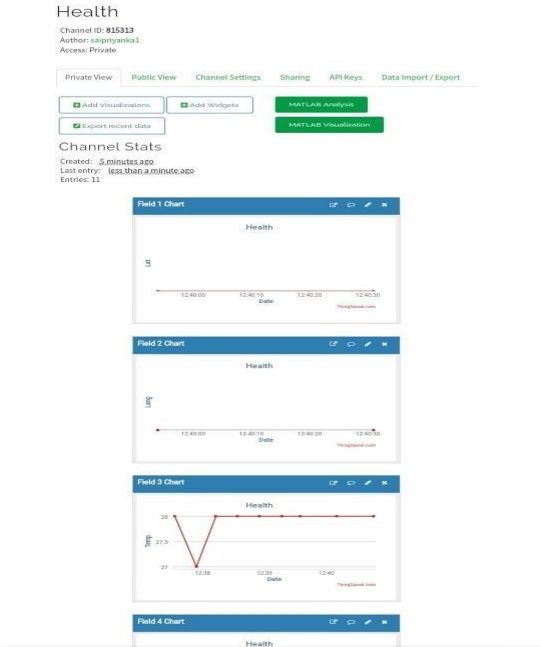
The proposed framework is design for Industrial Applications. This framework comprising of Wireless Sensors such as temperature sensor, smoke sensor and LPG Gas sensor. RF Modules are RF Tx and RF Rx, LCD, Buzzer. Temperature sensor, Smoke Sensor, Gas Sensor detects the information and screen in LCD, if in case temperature or gas or smoke builds it ought to illuminate naturally caution give by the buzzer module. RF module is utilized to control the devices remotely. At the point when the individual went into the RF zone it will give the status of the worker present. By

utilizing RF module we can control WSN sensors enactment from rest mode.

Embedded system deals with both Software and Hardware. Software is very important module to develop programming code. To implement proposed methodology we used ARDUINO IDE Software for Embedded C language editing, compiling and dumping. Simulation is very important tool to design project virtually, before hardware implementation. We used Proteus Software for simulation of complete project. Express SCH software used to design schematic diagram of project.

4. RESULT AND DISCUSSION

We successfully interfaced all input and output modules to microcontroller. Controller performed and execute results as per the requirement. We obtained auto alerts of gas, smoke leakage and temperature high alerts. We controlled the wireless devices using RF successfully.



5. CONCLUSION AND FUTURE WORK

We designed a Wearable Wireless Sensor System with RF Remote Industrial Activation for Industrial Applications for safe and security of employee state and industrial environment. In this paper, we have created and effectively actualized a Remote Sensor framework designed in a uniform which is inclined to Wireless Sensors such as temperature sensor , smoke sensor and LPG Gas sensor .The system is monitored and controlled by RF module wirelessly which is implemented andexecuted successfully. In future we use IoT module with Wireless Sensor Framework to

screen and control the information and sensor modules wirelessly. Likewise we can send information and screen all through the world.

REFERENCES

- 1 Lee, E.A.; Seshia, S.A. Introduction to Embedded Systems, A Cyber-Physical Systems Approach, 2nd ed.; MIT Press: Cambridge, MA, USA, 2017.
- 2 Security governs in coal mineshafts PB 05-618-07, Standard GOST (in Russian), 30.07.2003.
- 3 S. Matteo, A. Charleroi, "Wearable hardware and keen materials: a basic audit", Sens., vol. 14, no. 7, pp. 11957-11992, Jul. 2014, DOI: 10.3390/s140711957.
- 4 M. Chan, D. Estève, J.Y. Fourniols, C. Escriba, E. Campo, "Shrewd wearable frameworks: Current status and future difficulties", Artificial knowledge in drug, vol. 56, no. 3, pp. 137-156, Nov. 2012, DOI: 10.1016/j.artmed.2012.09.003.
- 5 S. Nabil, "Intelligent contemplations on the potential and difficulties of wearable innovation for medicinal services arrangement and restorative training", International J. of Information Management, vol. 35, no. 5, pp. 521-526, Oct. 2015, DOI: 10.1016/j.ijinfomgt.2015.04.010.
- 6 S. Scataglini, G. Andreoni, J. Chivalrous, "A Review of Smart Clothing in Military" in Proc. 2015 Workshop on Wearable Systems and Applications WearSys '15, Florence, Italy, 2015, pp. 53-54, DOI: 10.1145/2753509.2753520.
- 7 G. Ahmed Zeeshan " Design and Implementation of Child Activity Recognition Using Multi Sensors on Arm Processor " IJESC Vol. 6 ISSUE 8 August 2016.
- 8 G. Ahmed Zeeshan " IoT based Mining Workers Safety Monitoring and Alerting System by using Raspberry Pi " IJRECE Vol.6 ISSUE 3 July 2018.