

Safety Coalmine Results on Web application using Zig Bee

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Abstract: With continuous enlarging of exploiting areas and extension of depth in coal mine, many laneways become monitoring blind areas, where are lots of hidden dangers. Moreover, it is inconvenient to lay cables which are expensive and consume time. In order to solve the problems, we designed a coal mine safety monitoring system based on wireless sensor network, which can improve the level of monitoring production safety and reduce accident in the coal mine. Zigbee technology provides a direction for scientists who commit to solve the safety monitoring problems of coal mine. In this Paper we use CAN Bus along with Zigbee technology to reduce the cost and increase improve the speed of communication between base station and sync nodes?

Keywords: Zigbee, Mine Safety, CAN

1. INTRODUCTION

Underground mining operations prove to be a risky venture as far as the safety and health of workers are concerned. These risks are due to different techniques used for extracting different minerals. The deeper the mine, the greater is the risk. These safety issues are of grave concern especially in case of coal industries. Thus, safety of workers should always be of major consideration in any form of mining, whether it is coal or any other minerals. Underground coal mining involves a higher risk than open pit mining due to the problems of ventilation and potential for

collapse. However, the utilization of heavy machinery and the methods performed during excavations result into safety risks in all types of mining. Modern mines often implement several safety procedures, education and training for workers, health and safety standards, which lead to substantial changes and improvements and safety level both in opencast and underground mining Coal has always been the primary resource of energy in India, which has significantly contributed to the rapid industrial development of the country. About 70% of the power generation is dependent on it thus, the importance of coal

in energy sector is indispensable. But the production brings with it the other byproducts, which proves to be a potential threat to the environment and the people associated with it. In lieu of that the present work is a sincere attempt in analyzing the graveness and designing a real time monitoring system of detection by using the ZigBee technology.

2. RELATED WORK

In the hazardous environment, industrialized accident occurs. Due to which consequence may be very serious and it causes loss of environment, property and life. For moral, legal, & financial reasons hazardous environmental safety & security is more important wireless sensor network in industrial site, the deployment of distributed point source where the dangerous parameters used, produced and stored is described seven characteristics, fundamental aspects for estimating and emission method were identified. For measurement of temperature using Virtual Instrumentation is by Automatic Process Control in many industries. This paper shows agricultural environment monitoring system for monitoring information related to the outdoors production of agriculture environment using WSN technology. This research shows survey study of need related with long term stewardship & environment

monitoring. The aim of this paper is consideration of design for monitoring of the detection of hazardous parameter using system on chip. In the wireless communication during emergencies is important for survival for example during accident traditional wired communication system is not reliable which needed wireless radio system is. The field of electronics gives a very good performance and this is realized using zigbee technology guided by 802.15.4 PAN. WSN replaces existing non standard technologies. The Zigbee operates in 868MHz band at a data rate of 20kbps in Europe, 2.4GHz ISM band worldwide at a 250kbps, 914MHz band at 40Kbps in USA.

3. IMPLEMENTATION

ZigBee wireless sensor nodes mainly consist the sensor unit, signal conditioning circuitry, microcontroller (MCU), RF modules MC13193, timers, memory and power management module and other components shown in Fig.4. Micro-controller is responsible for collecting environmental information (such as temperature, carbon monoxide, methane, wind speed, etc.) and do some data conversion, responsible for controlling and managing the entire nodes; RF module MC13193 is responsible for the communication between nodes by a certain protocol ; the power module provides the

necessary power for the nodes separately to run the various parts.

Sensor nodes are the basis unit of wireless sensor network; node stable running ensures the reliability of the whole network. Sensor node is comprised of data acquisition module, data processing module, wireless communication module, alarm module and the power module. Node hardware connection is shown in Fig.4. The data acquisition module is used for sensing, collecting information and converting to digital signals. According to the need for monitoring parameters of coal mine, the

processor module is connected to gas sensor, pressure sensor, temperature sensor, and other kinds of sensor module, which is in charge of processing the data and coordinating the whole system. The wireless communication module is mainly responsible for communicating with other nodes. In addition, the energy problem is the key problem, because once nodes exhaust the energy of the battery, which will drop out of the wireless sensor network, so power consumption of the wireless sensor network should be low as far as possible.

4. EXPERIMENTAL RESULTS

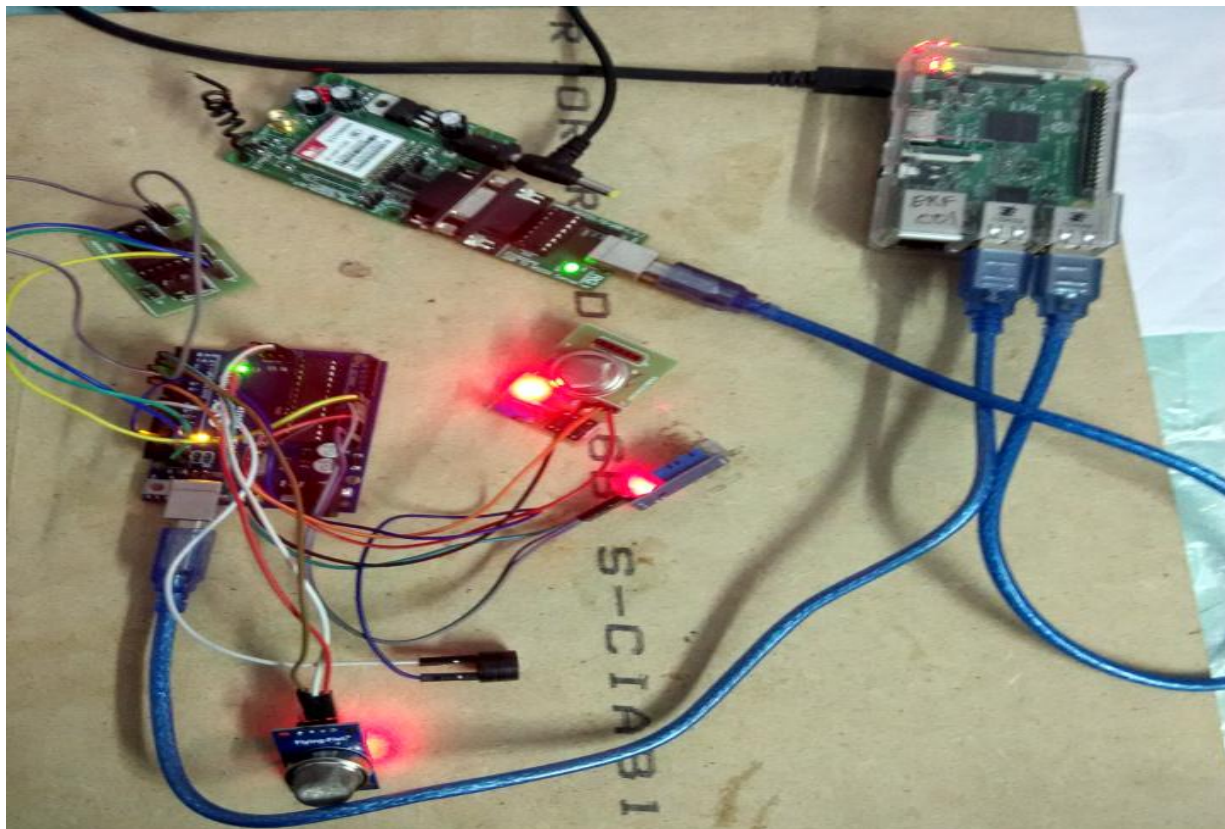


Fig:-1 Kit for Project

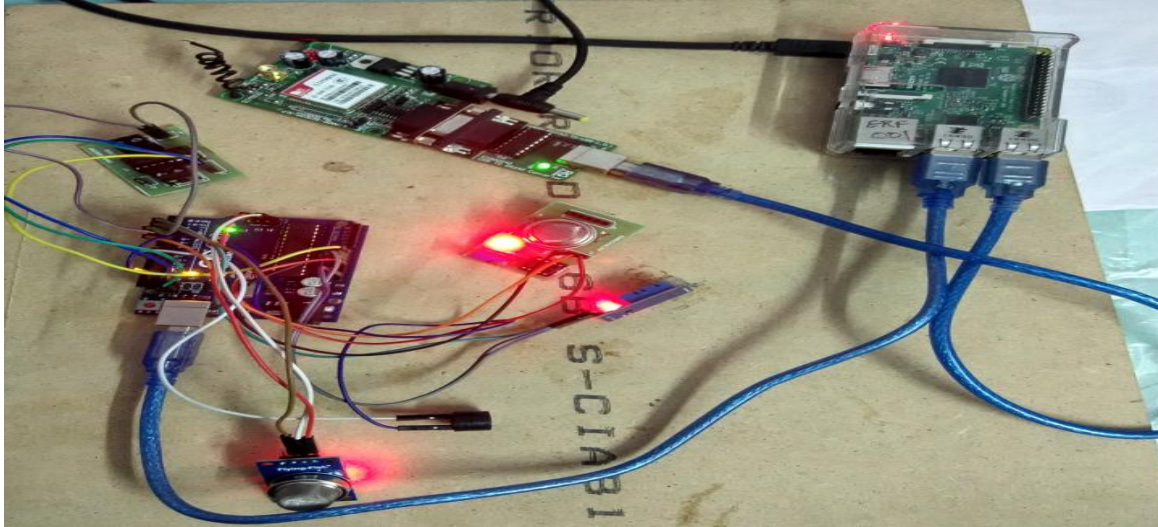


Fig:-2 Running Status of Kit



Fig:-3 Coalmine on Web application

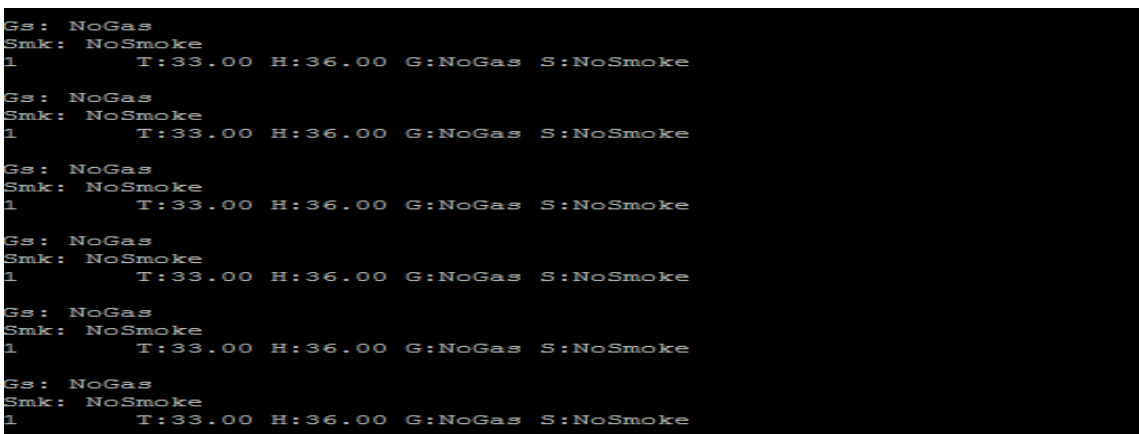


Fig:-4 Results on Kit

5. CONCLUSION

For Demonstration purpose we used the sensor. The gas sensor is more sensitive to the carbon monoxide but can sense methane, butane, LPG, hydrogen, smoke etc. We found more heating of sensor if operated for long time. The ZigBee communication is noise free. ZigBee and LPC2148 provides low power platform. More advanced version of controller like cortex-M3 can be used for more speed of execution and extreme low power consumption. With the use of sophisticated sensors, the system can work with more accuracy in real time. It can be modified in industrial monitoring as well.

6. REFERENCES

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