ISSN: 2582 - 6379
Orange Publications
International Journal for Interdisciplinary Sciences and Engineering Applications
IJISEA - An International Peer- Reviewed Journal
2024, March, Volume 5 Issue 1
www.ijisea.org

Coal Safety and Security System for monitoring the Environment with Driver less vehicle

Kistamsetti Rama Devi[1], Abdul Azeez[2]
PG Scholar[1], Assistant Professor[2]
Department of Electronics and Communication Engineering, Amrita Sai Institute of Science and Technology, Paritala, Knachikacherla, NTR District, Andhrapradesh, India
ramadevikistamsetti98@gmail.com[1]

ABSTRACT

The safety of coal mine is an important link in coal mine production, Gas disaster is the most harmful for the safety of coal mine production. During the process of mine development, it is very important to measure the gas, temperature and fire concentration in mines to safe the human life. Based on continuous revolution of coal mining technology, to forward this project about safety monitoring system of coal mine using Bluetooth technology. A system is designed using group of sensors which monitors the different environmental condition in underground mines and if value exceeds from threshold value, then the Miners are informed through buzzer. Another module is 16*2 LCD displays which is used to show the results of sensor condition in project. The system is flexible in the architecture of software and hardware, and can easily extend to other mine safety production fields.
Keywords: Sensors, Bluetooth Technology, coal mine, underground mines

I.INTRODUCTION

An embedded system can be thought of as a computer hardware system having software embedded in it. An embedded system can be an independent system or it can be a part of a large system. An embedded system is a microcontroller or microprocessor-based system which is designed to perform a specific task. For example, a fire alarm is an embedded system; it will sense only smoke. An embedded system has three components −It has hardware. It has application software. It has a Real-Time Operating system (RTOS) that supervises the application software and provides a mechanism to let the processor run a process as per schedule by following a plan to control the latencies. RTOS defines the way the system works. It sets the rules during the execution of the application program. A small-scale embedded system may not have RTOS.

So we can define an embedded system Microcontroller based, a software-driven, reliable, real-time control system. Characteristics of an Embedded System Single-functioned − An embedded system usually performs a specialized operation and does the same repeatedly. For example: A pager always functions as a pager. Tightly constrained − All computing systems have constraints on design metrics, but those on an embedded system can be especially tight. Design metrics a measure of an implementation's features such as its cost, size, power, and performance. It must before sizeto fit on a single chip, must perform fast enough to process data in real-time and time and time, and consume minimum power to extend battery life. Reactive and Real time−Many embedded systems must continually react to changes in the system's environment and must compute certain results in real-time without any delay. Consider an example of a car cruise controller; it continually monitors and reacts to speed and brake sensors. It must compute acceleration or de-accelerations repeatedly within a limited time; a delayed computation can result in failure to control the car. Microprocessor-based based − It must be microprocessor or microcontrollerbased. Memory − It must have a memory, as its software usually embeds in ROM. It does not need any secondary memories in the computer. Connected − It must have connected peripherals to connect input and output devices.HW-SW systems − Software is used for more features and flexibility. Hardware is used for performance and security.

Types of Processors can be of the following categories −General Purpose Processor (GPP) o Microprocessor o Microcontroller o Embedded Processor o Digital Signal Processor o Media Processor Application Specific System Processor (ASSP) Application Specific Instruction Processors (ASIPs).

ISSN: 2582 - 6379
Orange Publications
International Journal for Interdisciplinary Sciences and Engineering Applications
IJISEA - An International Peer- Reviewed Journal
2024, March, Volume 5 Issue 1
www.ijisea.org

II.PROPOSED METHOD

The Atmel ATmega328/P is a low-power CMOS 8-bit microcontroller based on the AVR-enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328/P achieves throughputs close to 1MIPS per MHz. This empowers system designer to optimize the device for power consumption versus processing speed.

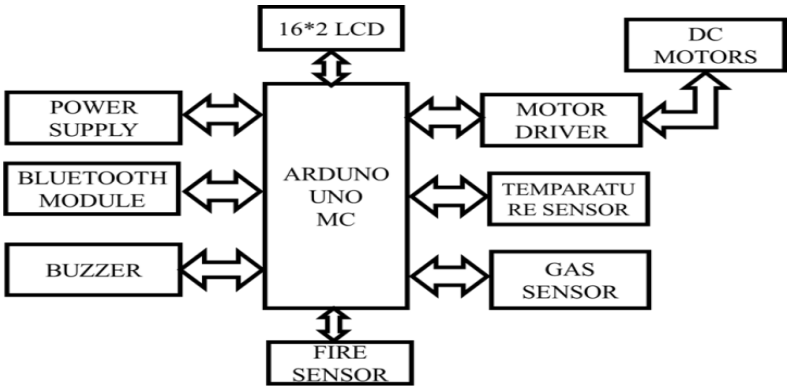


Figure 1: Shows the Block Diagram of Proposed method

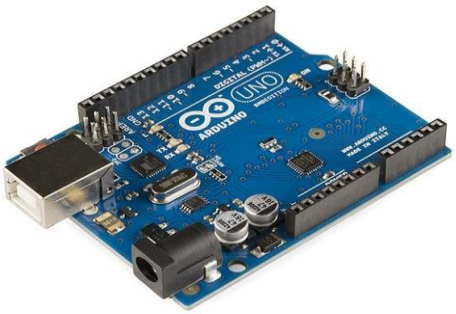


Figure 2: Shows the physical view of the Arduino Board

An Arduino board is a type of microcontroller-based kit. The first Arduino technology was developed in the year 2005 by David Cuartielles and Massimo Banzi. The designers thought to provide easy and low-cost boards for students, hobbyists, and professionals to build devices. Arduino board can be purchased from the seller or directly we can make it at home using various basic components. The best examples of Arduino for beginners and hobbyists include motor detectors thermostats, and simple robots. In the year 2011, Adafruit Industries expected that over 3lakhs Arduino boards had been produced. But, 7lakh boards were in the user's hands in the year 2013. Arduino technology is used in many operating devices like communication or controlling.

Link : https://forum.arduino.cc/t/getting-file-from-google-drive-and-downloading-it-to-arduino/564541

IV. RESULTS AND DISCUSSION

To overcome the above-mentioned day-to-day problem faced by the mine management, installation of wireless information and safety systems is a vital need for the mining industry. The wirelesses are more flexible and can avoid the trouble of rewiring because wireless networks can meet the moving and changing of topology.

It can use the fire gas and temperature sensors to sense the situation in mining area before the workers entering into the mines. the data can be transferred by the Bluetooth module (HC05)

ISSN: 2582 - 6379
Orange Publications
International Journal for Interdisciplinary Sciences and Engineering Applications
IJISEA - An International Peer- Reviewed Journal
2024, March, Volume 5 Issue 1
www.ijisea.org

In this application monitoring of the underground coal mine system based on wireless communication network. In case of disaster, the system will help to locate the miners who are trapped inside under ground coal mines. This will solve the time taken for rescue work since it is automated increasing the life safety of rescuers and coal mine workers.



Figure 3: Shows the Physical view of the Project

REFERENCES:

[1] Yu Haibin, Zeng Pinging, "Intelligent wireless sensor network system" Beijing: Science Press, 2006.289.
[2] Microchip ZigbeespecificationVersion1.0,US:MicrochipTechnologylnc,2005.
[3] QIN Tinghao, DOU Xiaoqian, "Application of Zigbee Technology in W ireless Sensor Network," Instrumentation Technology, 2007, pp.57-59.
[4] He Hogjiang, Wang Shuang you., "The Application of armand Zigbee Technology Wireless Networks in Monitoring Mine Safety System," Proceedings of the International Colloquium on Computing, Control, and Management, 2008, pp 430-433.
[5] Mohammad reza Akhondi, Alex, Simon Carlsen, Stig Petersen. Applications of Wireless Sensor Network sin the Oil, GasandResourcesIndustries,24thIEEEInternationalConferenceon Advanced Information Networking and Applications, 2010.
[6] H. Martín H, A.M. Bernard's, Bergeson, L.Tarrio. P, "Analysis of key aspects to manage Wireless Sensor Networks in Ambient Assisted Living environments, "International