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Design and Development of Security System for Generic Parameters in Coal Mine

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Abstract: ***Using embedded Systems this paper monitors the presence of human beings in the coal mines. The method utilizes sensors, microcontrollers, Bluetooth to realize the operational parameter and intelligent monitored management of entire mining area. Embedded systems are controlled by one or more main processing cores that are microcontrollers. The key characteristic, however, is being dedicated to handle a particular task, which may require very powerful processing systems. If the presence of any human being is detected, then the micro controller transfers the signal to the PC (Control room).***

Keywords: ARM (Advanced RISC machine), Bluetooth Module (HC-05), gas sensor (MQ2), light sensor (LDR), temperature sensor (LM35), Fire sensor (DR25).

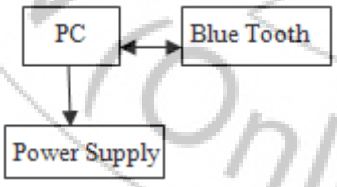
1. Introduction

In coal mine, Security system is needed for human beings and for improving production because a coal enterprise is a high risk profession and technique, The Embedded systems is dedicated to specific tasks, design engineers can optimize it to reduce the size and cost of the product and increase the reliability and performance. This is the project which has been developed to detect the human in the restricted places, leakage of any hazardous gases, low light, fire detection and temperature sensor

1.1 Sending Messages

The most important functionality of a wireless node is to communicate, or send and receive data used by Bluetooth Module (HC-05). All protocols have reserved buffers for the data transfer.

1.2 Receiver



2. Hardware Module

2.1 About Embedded Technology

Each day, our lives become more dependent. *On Embedded Systems,[1] digital information technology that is embedded in our environment. It includes not only safety- critical applications such as automotive devices and control, railways, aircraft, aerospace and medical devices[4].*

3. Software Module

The use of C language to program microcontrollers is becoming too common. And most of the time it's not easy to build an application is assembly which instead you can make easily in C. So it's important that you know C language for Arm which commonly know n as Embedded C.

Microcontrollers Architecture support every level of software developer from the professional applications engineer to the student just learning about embedded software development. The industry-standard Keil C Compilers, macro assemblers, debuggers, Real-Time Kernels, Single board Computers, and Emulators support all Arm derivatives and help you get your projects completed on schedule.

4. Sensor Algorithm

STEP1:
Start the Program

STEP2:
Assign the values for read, write, Enable ports.

STEP3:
If enable =1 and set=0, condition satisfied, sensor operators for 100 seconds.

STEP4:
After 100 seconds reset occurs when enable=1 and set=1

STEP5:
If enable=1 and set=0, condition is satisfied, at second temperature sensor operates for 100 seconds

STEP6:
After 100 seconds reset occurs when enable=1 and set=1
STEP7:

If enable=1 and set=0, condition is satisfied, at third light sensor operates for 100 seconds. It can sense for a distance of 5 to 6 meters.

STEP8:
After 100 seconds reset occurs when enable=1 and set=1

STEP9:
If enable=1 and set=0, condition satisfied, at last fire sensor operates for 100 seconds

STEP10:
After 100 seconds reset occurs when enable=1 and set=1

STEP11:
In while loop statements will be called i.e., initial, abnormal, and normal.

STEP12:
If anyone of the four sensors reaches the abnormal value, information will be sent to PC

STEP13:
The sensors again start their operation after a delay of 100 seconds by reset simultaneously after one another.

5. System Summarization

Coal mine detection using embedded system mainly monitors the parameters in coal mine like gas, temperature as well as human beings. The author [5]as also proposed about the human count, location and track. Some major units involved are

1. Hardware part of the system comprises sensors, Arm-7
2. Software part of the system MC lab and Keil C.

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