PARAMETER MONITORING AND CONTROL OF BANK RECORD ROOM USING EMBEDDED SYSTEM

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ABSTRACT

Bank is a one of the example of institute that using information technology in its daily task to fulfill the organization and customers need. Thus bank has its own system to insure their transaction works the way it is and prevent any activity that could cause lost to the organization and its clients and all customers. System used sensors which are used in daily applications in order to reduce the human need in banks. In our paper some sensors are used to satisfy the human needs. Bank record room weather monitoring plays an essential role, so the collection of information about the temporal dynamics of weather changes is very essential. In any bank record room during certain hazards it is very essential to monitor weather. This paper proposes a GSM module; it is a very effective and accurate technique to transmit useful information. That Information contains the parameters such as temperature and humidity of the medium. The system use wireless sensor network.

Keywords: Information Technology; Sensors; GSM Module; Temperature; Humidity; Wireless Sensor Network

I. INTRODUCTION

With the latest technological advancements in the 21st Century human beings are more concerned with security, convenience and comfort. As technology rapidly changes so has crime. Also with people leading a busy lifestyle there is a necessity of controlling bank appliances and performing bank surveillance remotely in bank record room. Most of the bank appliance and security systems currently in the market are limited in terms of area of coverage and number of electronic devices to be controlled.

The goal of the project is to design and implement a smart system for controlling the bank record room. Appliances manage remotely with the help of a mobile device and getting alerts on intrusion. The major factors which have been put into consideration are an ability and scalability. The system will have features that can enable automatic monitoring and control, detection and switching functionality for bank record room.

The advancement in the technology enabling the faster rates of communication and better parameter sensing devices allows both convenience and the fidelity while transmitting information from one side to another. The proposed device will be packed along with the product. Initially depending upon the type of product the owner will set upper and lower threshold values of parameters i.e. temperature, relative humidity etc. Once initialized, the device will continuously measure these parameter values and compare it with the threshold value. If in case any of these parameter values goes above or below the threshold value, an SMS alert will be sent to the owner/user. There will be a motion sensor for controlling a security of records. IR flame sensor used for detection of fire. Fire detection technology combined with wireless communication networks is a new and important

direction, which can actualize no wiring requirement. With the GSM module incorporated into the system, user is capable to see the status of parameters. Hence owner will be able to take a quick action to preserve the record room.

II. LITERATURE SURVEY

The literature related to the research topic has been reviewed for last twenty years in order to find out work carried out by various researchers. There are many systems for remote monitoring and control designed as commercial products or experimental research platforms.

Liu Shixing, Xie Wujun , Applied advanced wireless sensor network technology and Internet technology they designed wireless fire monitoring network which can detect two fire parameters the temperature and concentration of smoke 2010[1].

Fabian Höflinger, Rui Zhang their preliminary data showed, that motion caption via motion sensor is a feasible tool to study animal behavior in normal condition. The active sensor worked effectively for a limited time due to its battery lifetime 2015[2].

Meer Soheil Abolghasemi proposed the basic problem of the SMS-based system is that practically there is no encryption on the short messages. In GSM networks, different versions of the "A5" encryption is used 2013[3].

Pouya Bolourchi and Sener Uysal, in this paper the main focus is to make an intelligent decision using a fuzzy logic system in wireless sensor networks for forest fire detection. With means of fuzzy logic toolbox in MATLAB we are able to find the probability of fire 2013[4].

Vandana, Wasim G. Madiwale proposed a hybrid data logger, to automatically monitor and predict the changes of temperature, relative humidity and CO level in the cargo environment. This data logger uses PIC microcontroller to control the hardware for recording and monitoring of general purpose measurements [5].

Exhaustive research has been carried out based on Monitoring scheme with various protocols and systems providing detailed description of remote process states to the authorized users. Many remote monitoring systems have been designed and experimented by using GSM-SMS which normally involved the use of GSM modem for carrying sensing and control of devices in the system by users having cellular coverage. Numerous systems have been developed using Wireless Sensor Networks which consists of several sensor nodes in proximity and having data transmission and reception capability between nodes and central base station for wide range of applications.

III. PAPER AIM & OBJECTIVE

The Project aim is to overcome the Problems faced in bank record room like manual monitoring, No indication of fault occurring, automatically power off switch, So the project aim is monitoring parameters by sensing temperature and humidity through sensors and transmitting this data to control station with use of PIC micro controller and GSM technology.

The objectives of the paper were threefold:

- Making an inventory of the available condition monitoring techniques and selecting a set which has added value for Bank Record Room;
- To instrument a Record Room and demonstrate some of the selected condition monitoring techniques;

- Identifying areas for further development, e.g. new sensors, algorithms for data analysis, or integration of the systems in the Record Room.
- To control fire using short message service.

IV. METHODOLOGY

The methodology used in this project is that the system is an embedded system which will monitor and control the parameters of a Bank record room on a regular basis round the clock for records and to eliminate the difficulties involved in the system by reducing human efforts to the best possible extent. This method ensures 100% yield with record room whose parameters are monitor and controlled. This system uses PIC 18F4520 controller and GSM system.

Transmitter and receiver sections are as shown above respectively. Transmitter section named as system for record room and receiver circuit is system for office. The PIC18F4520 microcontroller is interfaced with 16*2 LCD.LCD is used to display the readings of parameters which are being monitored. For transmission and reception of the signal RF module is used. In system four sensors are used that are interface with PIC microcontroller. Temperature sensor used to measure the temperature. PIR sensor indicates the motion.
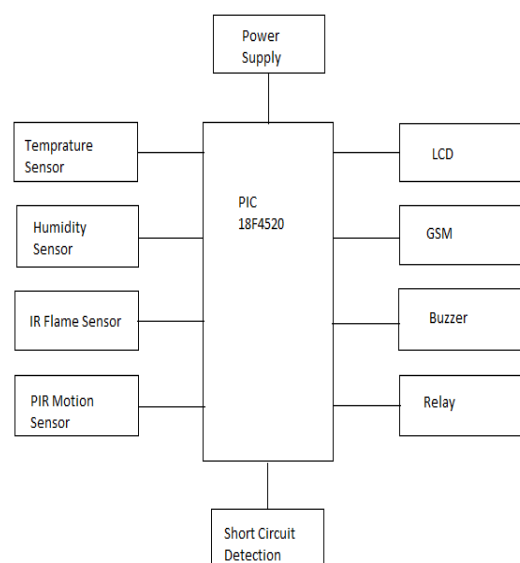
Fig. 1.Block Diagram for system of record Room(Transmitter)
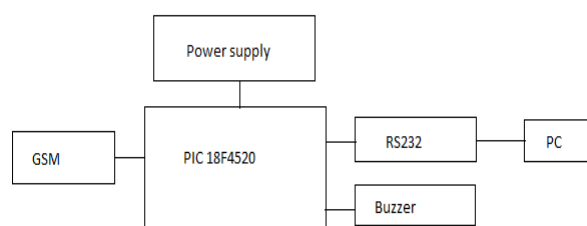
Fig.2. Block Diagram for system of office (Receiver)

Humidity sensor is an analog sensor and this sensor gives the value of change in humidity in the atmosphere as per the application. Message will be send to owner through the GSM module. Flame sensor indicates live fire and smoke. Buzzers are used in a system to grab the attention regarding an emergency situation is occurred. Relay is used for security purpose for valid person entry and for operation of door.

System consists person detection sensor i.e. PIR sensor, Fire sensor, Temperature Sensor, Humidity sensor, RS232 protocol, Buzzer, GSM module and display units. When the power supply is ON the complete system will be activated. Sensors being connected to the PIC microcontroller they sense the data i.e. (Presence sensing and fire detection) and provide it to the controller. Controller then processes the analog data and converts it to the digital form and transmits it to the RF transceiver via RS232 to the personal computer (PC).

The transmitters take input from controllers serial transmission pin and send the output to RS232's receiver. The receivers, on the other hand, take input from transmission pin of RS232 serial port and give serial output to microcontroller's receiver pin and GSM also used for wireless communication .Processing node then gives this data to LCD display in order to display the values sensed by the sensor. Processing node also has a buzzer, which comes into action only when the pre-defined values of the parameters exceed the limit. As soon as the values are exceeded the buzzer starts ringing. Our propose model also has a provision in which if the parameter's value again gets normalized after shooting up, the system starts working normally.

4.1 A. GSM-SMS Based Monitoring

With the wide spread use of cellular networks, this approach is also popular when small amount of data is to be transferred through the network. Extensive work has been carried out by researchers using this approach especially in bank field. To describe a remote monitoring system based on SMS of GSM the system includes two parts which are the monitoring center and the remote monitoring station. The monitoring center consists of a computer and a TC35 GSM communication module. The computer and TC35 are connected by RS232.

The remote monitoring station includes a TC35 GSM communication module, a MSP430F149 MCU, a display unit, various sensors, data gathering and processing unit. Mobility is measured by an accelerometer-based portable unit, worn by each monitored subject. The portable unit houses the Analog Devices ADuC812S microcontroller board, Falcon A2D-1 GSM modem, and a battery-based power supply.

4.2 Remote Monitoring using Wireless Sensor Networks (WSN)

Many Wireless Technologies like RF, Wi-Fi, Bluetooth and Zigbee have been developed and remote monitoring systems using these technologies are popular due to flexibility, low operating charges, etc. Today Wireless Sensor Network is used into an increasing number of commercial solutions.

V. RESULT DISCUSSION

If fire is detected in the room through the GSM module the message should be sent to fire Bridget & to the owner. For informing this to an owner that fire has been detected, it will ring the buzzer. If person or any animal is in Record room the PIR sensor will detects its motions and according to this it will turn ON Buzzer in the room. Temperature and humidity will be sense by sensors.

After sensing all the parameters, send the status to the central station through an RF transceiver. Read the message coming from central station & display the message on LCD. Read the status of various sensors & display it. If no message then it will start execution from the initial stage & if message is present it will go to the room terminal control

VI. CONCLUSION

This system can be beneficial to the bank as it is cost effective and can be accessed remotely. This system will help the bank to implement the system to regulate the environmental parameters such as temperature and humidity and other parameters. An overview of the GSM network and a brief discussion on positioning techniques in cellular networks were also presented.

In order to monitor and control the parameters of bank record room, this project is implemented on PIC, the sensors which are used to detect the status of various parameters and monitoring them.

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