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PORTABLE WIRELESSSYSTEM FOR MONITORING WILDFIRE

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Abstract: *The main objective of this project is to design and implement a portable System for monitoring the forest fire. A simple prototype with sensors hasbeen designed and implemented to scan and monitor the parameters in the forest environment . PIR sensors senses human mobility and temperature sensors monitors the surrounding temperature. All these values are sent to the control section using GSM modem. In reply to the message control unit GSM sends the message to the Pre-defined forest authoritarian .The proposed system enables the user to send commands to the remote station and received sensor values from the forest through the mobile communication..*

KEYWORDS*: Time Division Multiplexing(TDM), pulse width modulation(PWM) ,Global System for Mobile Communication(GSM),Passive Infrared Sensor(PIR), Motor Driver.*

I. INTRODUCTION

Forest fire monitoring can be done in several ways such as: by using people and tower for observationcombined with the actual inspection, satellite images, video surveillance and image processing. Considering the methods individually, the forestfire monitoring system using people is more accurate than other methods, but there is a problem of human fatigue. The system using satellite images is non-real-time and of high budget. The monitoring system of image processinghas received more and more attention from researchers because it is of low cost and real-time detection. Research has proposed many techniques for detecting forest with images from video surveillance by the analysis of many characteristics offers such as colour of the flame, moving direction and colour of smoke. Also fire detection using dynamic characteristics with artificial neural networks proposed to analyse various fires in order to classify objects and substances similar to fire. This project deals with the detection of forest fire at its initial stage by detecting the smoke produced during a fire.

1.1 EXISTING SYSTEM: At present ,traditional forest fire monitoring measures include watching tower,longdistance video monitoring and satellitemonitoring .Even though these methods are efficient but there are still lot of drawbacks in this system**.**

1.2. DRAWBACKS

1. Man power is needed to monitor.
2. Difficult to trace the areas which are affected by fire.
3. Time consumption

1.3 PROPOSED SYSTEM: Here the wireless sensors are used to monitor the environmental conditions and transmit that monitored information to the collecting section using GSM.We are using various wireless sensors such as temperature sensor,PIR sensor etc..In proposed system we can design a new system to monitor the forest areas.This system decides whether the environmental status leads to forest fire or not and it updates the value in the GSM through the modem

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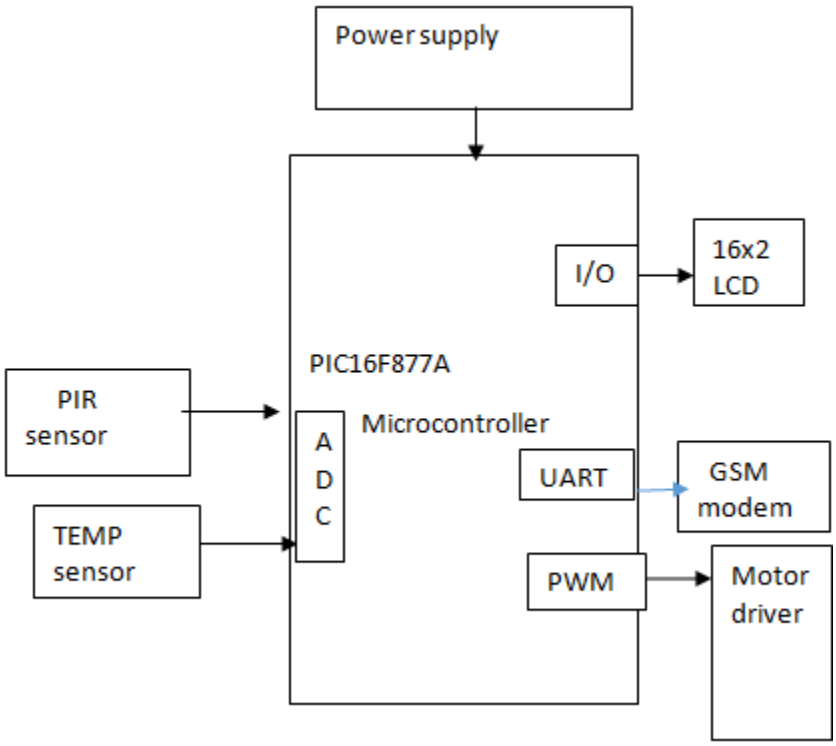

FIGURE 1. BLOCK DIAGRAM

In this block diagram we have totally 7 blocks. The first block is PIC microcontroller. It has totally 2 sensor input. The first sensor input is PIR Sensor. A typical system for detecting infrared radiation using infrared sensors includes the infrared source such as black body radiators, tungsten lamps and silicon carbide. It is widely used in tracking, thermograph, communication etc..LM35 is precision IC temperature sensor with its output proportional to the temperature (in degree celsius). At present PIC microcontrollers are widely used for industrial purposes due to its high performance ability at low power consumption. It is also very famous among hobbyists due to moderate cost and easy availability of its supporting software and hardware tools like compilers, simulators, debuggers etc**..**

II. PIR SENSORS

A passive infrared sensor is an electronic sensor that measures infrared light radiating from objects in its field of view. They are most often used in PIR based motion detectors.

2.1 INTRODUCTION:

Compact and complete, easy to use PIR Sensor Module for human body detection. Incorporating a Fresnel lens and motion detection IC, suitable for a wide range of supply voltages and with low current drain. Adjustable delay time with high sensitivity and low noise. Output is a standard TTL output signal .

2.2 FEATURES: Complete with PIR, Motion Detection IC and Fresnel LensDual Element Sensor with Low Noise and High Sensitivity.Supply Voltage: 5-20Vdc

1. Delay Time Adjustable: 5 seconds to 18 Minutes
2. Standard TTL Output
3. Module Dimensions: 28mm Length, 38mm Width, 40mm Height

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Figure 2. PIR SENSOR

SB0061 is a pyroelectric sensor module which developed for human body detection. A PIR detector combined with a fresnel lens are mounted on a compact size PCB together with an analog IC, SB0061, and limited components to form the module. High level output of variable width is provided

Features and Electrical Specification

1. Compact size (28 x 38 mm)
2. Supply current: DC5V-20V (can design DC3V-24V)
3. Current drain :< 50uA
4. (Other choice: DC0.8V-4.5V; Current drain: 1.5mA-0.1mA)
5. Voltage Output: High/Low level signal ： 3.3V
6. (Other choice: Open-Collector Output)
7. TTL output
8. High sensitivity
9. Delay time： 5s-18 minute
10. Blockade time： 0.5s-50s (acquiescently 0 seconds)
11. Operation Temperature: -15oC -70Oc
12. Infrared sensor: dual element, low noise, high sensitivity
13. Light sensor: CDS photocell (can be add as customer requirement)

2.3 LENS INFORMATION

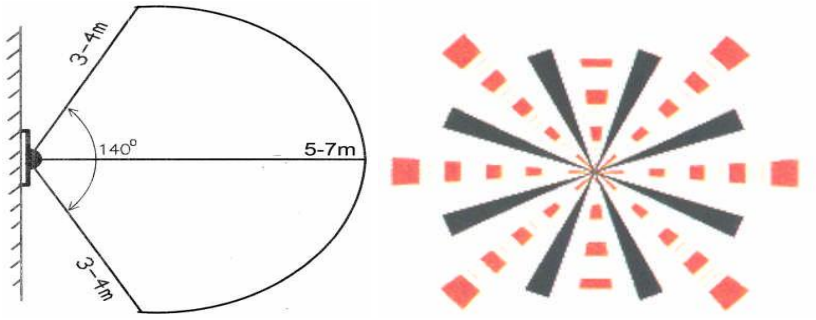

FIGURE 3 LENS INFORMATION

1. Power anode
2. Output: High level signal
3. Power cathode

H: Can be spring repeatedly
L: Can not be spring repeatedly
CDS: Photocell

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2.4 APPLICATIONS

1. Tracking and art history
2. Climatology, meteorology and astronomy
3. Heating ,hyper spectral imaging and night vision

III. GSM ARCHITECTURE

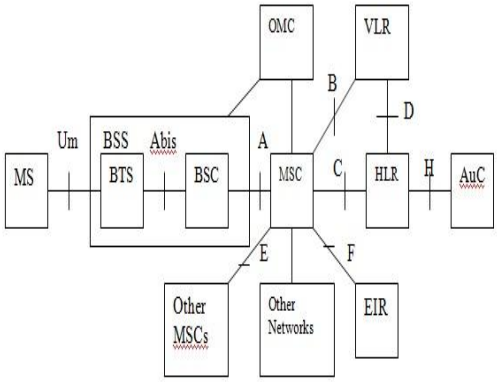

FIGURE 4 .GSM ARCHITECTURE

The GSM makes use of narrowband Time Division Multiple Access (TDMA) technique for transmitting signals. The GSM was developed using digital technology. It has an ability to carry 64 kbps to 120 Mbps of data rates. Presently GSM support more than one billion mobile subscribers in more than 210 countries throughout of the world. The GSM provides basic to advanced voice and data services including Roaming service. Roaming is the ability to use your GSM phone number in another GSM network. A GSM digitizes and compresses data, then sends it down through a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band.

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