

Header section- used to synchronize to the beginning of the packet. This consists of a row of 20 bit one's followed by a single bit zero. The long sequence of one's gives the receiver time to settle and the decoding software to synchronize.

Address- consists of 8 bit data in the byte followed by a single bit one and single bit zero. Receiver checks these bytes to make sure its intended for this receiver.

Data- this is same as address, 8 bits followed by a single bit one and a single bit zero.

Checksum- consists of 8 bits followed by a single bit one and a single bit zero. This byte makes sure that data the data is received correctly. If it fails data should be discarding.

Total of 52 bits to send just a 8 bits data byte. Two bytes will take 62 bits or four bytes will take 82 bits.

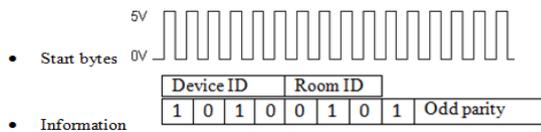


Fig. 7. RF transmission

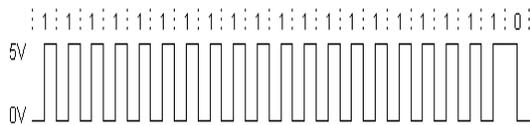


Fig. 8. Header bits

XI. SYSTEM OVERVIEW OF SENDING SMS

Block diagram of figure (9) shows the system overview of sending sms. It consists of wireless control smoke and fire detection module [8], computer, GSM module and a receiving mobile station.

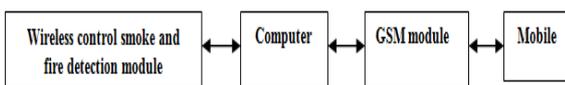


Fig. 9. Block diagram of sending SMS

Command	Description
AT	Check if the serial interface and GSM module working
ATE0	Turn echo off, less traffic on signal line
AT+CNMI	Display of new
AT+CPMS	Selection of sms memory
AT+CMGF	sms starting point, how they are compressed
AT+CMGR	Read new message from a given memory location
AT+CMGS	Send message to a given recipient
AT+CMGD	Delete message

Fig. 10. AT command set

After detecting smoke or fire the detector module will activate a relay by the help of the PIC microcontroller connected to the module. The relay is connected to the PC via parallel port. The incoming signal is read by the parallel port status register address. The programme then sends a specified

message to a particular mobile station via the GSM module connected to the computer's com port. The protocol used by the GSM modules for set up and control is based on the Hayes AT-Command set. Since the main objective for this application note is to show how to send and receive text messages, only a subset of AT-Command set needs to be implemented.

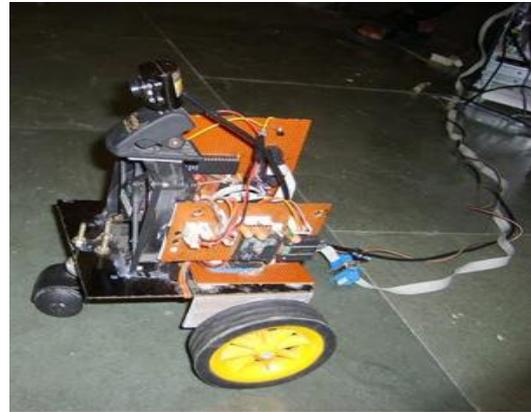


Fig. 11. Fire extinguishing vehicle

XII. FIRE EXTINGUISHING VEHICLE

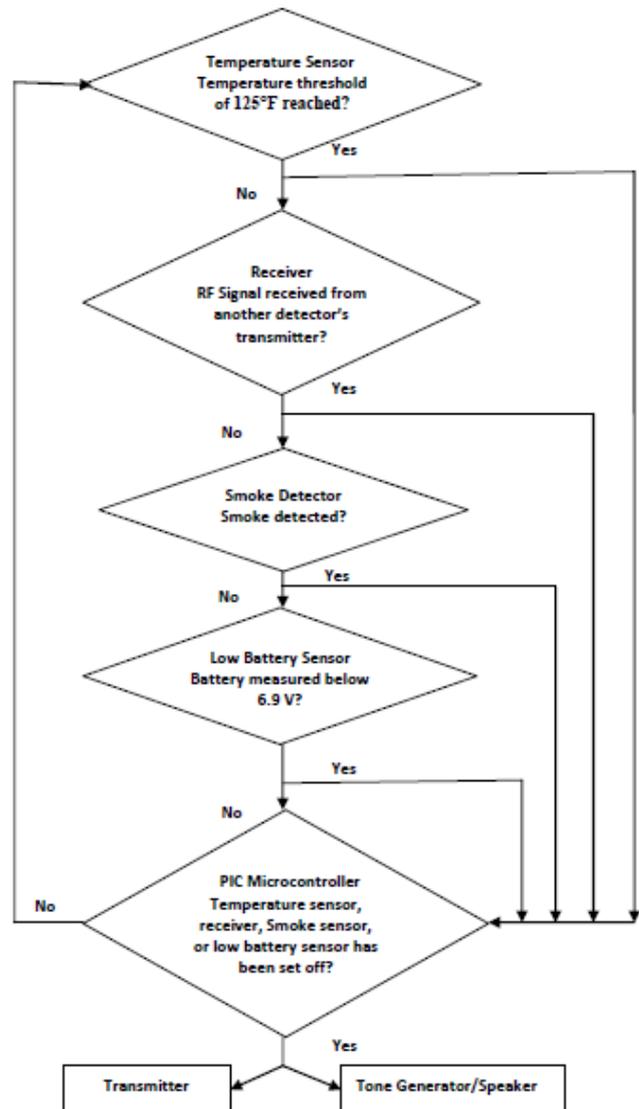


Fig. 12. Flowchart for the PIC microcontroller

A microcontroller (atmega 16) based fire extinguishing vehicle can be used to extinguish the fire. Someone can also operate and control the vehicle. This vehicle has different features and it will operate after the smoke detector network detects smoke or fire. Different features of the fire extinguishing vehicle and their functions are given below.

Fire Extinguisher- The vehicle carrying the fire extinguisher locates the fire and extinguishes it. It follows the predefined path to find out the origin of the fire.

Manual Remote Control- A manual remote control can navigate the vehicle and do the assigned purposes.

Obstacle Detection- It emits an infrared light. If there is any obstacle, the light will be reflected and detector will sense it.

Temperature Sensor- By using a temperature sensor the vehicle can sense the temperature around it. By using this facility it can find out the distance of the fire and safety move from the endangered place.

Image Processing- A webcam can be fitted at the top of the vehicle to take the image of the location and further processing can be done to find out the location and distance of the origin of the fire.

XIII. CONCLUSION

This paper enhanced the smoke and fire detection technology to save lives of people and property more and more. The heart of the system is a PIC microcontroller which is very cheap now a day. The fire extinguishing vehicle is controlled by an atmega 16 microcontroller which is also very cheap and easily programmable. The sms sending feature make the system more reliable and more sophisticated in terms of life safety as it is done by the help of a gsm module. The use of photoelectric smoke detector in the design makes the system more reliable for detecting smouldering fire. In addition one can use ionized smoke detector instead of optical smoke detector for more fast operation and sensitivity. Enhancement work can be done on point out the origin of fire .We have introduced the webcam facility. So better image processing methods can be included to find out the exact point from where fire has been originated.

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Toufiqul Islam was born in the city Lalmonirhat, Bangladesh in the year 1988. He received his B.Sc. Degree in Electrical and Electronic Engineering (EEE) from the department of EEE of Islamic University of Technology (IUT), Gazipur, Bangladesh in the year 2010.

He is now working as a Lecturer of EEE at Atish Dipankar University of Science and Technology (ADUST). He is also working as an Adjunct Faculty of EEE at Ahsanullah University of Science and Technology (AUST). His research area includes Microcontroller based system design and Renewable energy arena.



Syed Asif Abdullah was born in Dhaka, Bangladesh in the year 1988. He received his B.Sc. Degree in Electrical and Electronic Engineering (EEE) from the department of EEE of Islamic University of Technology (IUT), Gazipur, Bangladesh in the year 2010.

He is working as an Aircraft Maintenance Engineer (AME) at GMG Airlines Ltd. Along with this he is engaged in teaching at different Aeronautical institute. His research area includes Microcontroller based system design and Biomedical Signal processing.



Golam Sarowar was born in the city Dhaka, Bangladesh in the year 1984. He received his B.Sc. Degree in Electrical and Electronic Engineering (EEE) from the department of EEE of Islamic University of Technology (IUT), Gazipur, Bangladesh in the year 2005. He has completed his M.Sc. in EEE from Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh in the year 2009.

He is working as an Assistant Professor at Islamic university of Technology (IUT). His research area includes Microcontroller based system design and Power System Protection.