

Armed Robot for Bomb, Smoke, Temperature Detection

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Abstract— Everyone knows that being a soldier is a dangerous job, but some of the tasks that soldiers are required to do are more dangerous than others. Walking through minefields, deactivating unexploded bombs or clearing out hostile buildings, for example, are some of the most dangerous tasks a person is asked to perform in the line of duty.

What if we could send robots to do these jobs instead of humans? Then, if something went wrong, we'd only lose the money it cost to build the robot instead of losing a human life. And we could always build more robots. Today's modern military forces are using different kinds of robots for different applications ranging from mine detection, surveillance, logistics and rescue operations. In the future they will be used for reconnaissance and surveillance, logistics and support, communications infrastructure, forward-deployed offensive operations, and as tactical decoys to conceal maneuver by manned assets. In order to make robots for the unpredicted cluttered environment of the battlefield, research on different aspects of robots is under investigation in laboratories to be able to do its job autonomously, as efficiently as a human operated machine can do.

Keywords:-zigbee module(pro); bomb detector kit; surveillance; micro-controller unit.

1. INTRODUCTION

In today's world robotics is the vast developing field as it reduces the manual work and as well as manual errors. Robotics technology has gained a high value in market because of its accuracy, precision and adaptability many countries are trying hard to utilize the full benefit of this technology with the increase in need to monitor one's surroundings owing to ever increasing security needs as a result of rise of threats at various levels such as terrorism, cross border infiltration or unauthorized access to private premises surveillance has become an important field of technological development .To that end several technologies have been developed over the years. This project aims to present microcontroller based surveillance platform that is effective as a surveillance tool as well equipped with sensor to detect faults and take automatic preventive actions.Military robotics isn't about creating an army of humanoids but utilization of robotics technology for fighting terror and defending the nation. Thus, military robots need not be humanoids or they not necessarily need to carry weapons, they are just those robots that can help the armed forces. The opportunities offered by these technologies are boundless. The vision of robot army isn't a present day concept. The introduction of military robots is dated back from 1898 by the introduction of radio boats by Nicola Tesla.The military is unquestionably the first user of new technologies and developments, in technique, and is also, very often, the booster for new developments, when it becomes necessary to invent new technologies for military systems. Many basic technologies, which were used in the military for the

first time, have become part of the industrial robot

today. However, the definition of military robotics and industrial robotics is still very different. The military has specific, robotized equipment, whereas, in industrial terms, the robot is more of an intelligent, flexible, mass production machine. In the future, the use of industrial robots for military applications will become ever more possible. Price and development of the technical abilities of the modern robot will increase the interest of military users. In the following article, the author will indicate

that the motivation for the use of robots, within the military and within industry, is the replacement of humans. The reasons for this replacement are, as follows: quality, cost and humanization; however, using a different approach in each field, of course.

2. RELATED WORK

Broadly defined, military robots date back to World War II and the Cold War in the form of the German Goliath tracked mines and the Soviet teletanks. The MQ-1 Predator drone was when "CIA officers began to see the first practical returns on their decade-old fantasy of using aerial robots to collect intelligence".Theuse of robots in warfare, although traditionally a topic for science fiction, is being researched as a possible future means of fighting wars. Already several military robots have been developed by various armies. Some believe the future of modern warfare will be fought by automated weapons systems. The U.S. Military is investing

heavily in research and development towards testing and deploying increasingly automated systems. The most prominent system currently in use is the unmanned aerial vehicle (IAI Pioneer & RQ-1 Predator) which can be armed with Air-to-ground. Sunny Roy & Micheal Fernandes developed this project in 2008. Aim of that project is to develop a Robot that can be controlled by using a PC through (wireless) Zigbee protocol. By which we can control the directions of movement and also the capturing the images. But it did not have any sensors and was only used for controlling.

3. EXPLANATION USING BLOCK DIAGRAM

In this, PC or Remote is used to operate the ROBOT by giving instructions. When the instruction is given, it passes through the ZIGBEE model which is a serial port used for communication between PC and Micro-Controller. RS 232 Logic is used in this ZIGBEE model. As serial communication is to be done it is used for short distance communication. MAX 232 is used to connect ZIGBEE model and MICRO-Controller. MAX 232 is used as a DATA CONVERTOR for Micro-Controller. We have taken out 4 sensors: -Temperature (Heat) Detector, Smoke Detector, Poisonous Gas Detector, Metal Bomb Detector. A buzzer is connected to the Micro-Controller so that if the above sensors sense any of the particular material (Heat, smoke, metal, poisonous gas) it will start ringing. Two motors are taken which are used as Water Motor and Machine Gun. If excessive Heat is detected or sensed, then according to given instruction the Water motor will start. Here the Water Motor will convert the heat in Voltage and Control it.

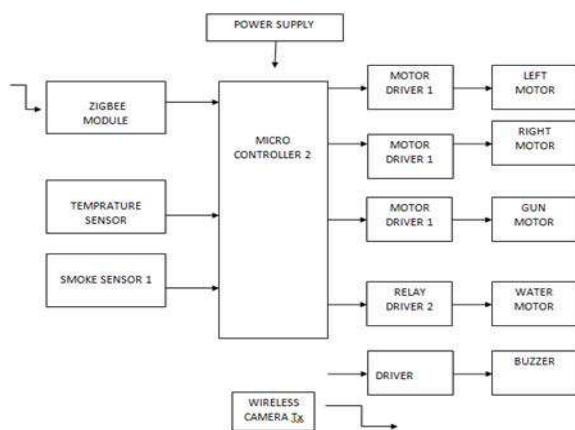


Fig1. Block diagram of armed robot

(i) **Microcontroller**: -The AT89C2051 is a low-voltage, high performance CMOS 8-bit microcomputer with 2K

Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set. By combining versatile 8-bit CPU with Flash on a monolithic chip, the AT89C2051 is a powerful microcomputer which provides a highly flexible and cost-effective solution to many embedded control applications. The AT89C2051 provides the following standard Features: 2K bytes of Flash, 128 bytes of RAM, 15 I/O lines, two 16-bit timer/counters, a five vector two-level interrupt architecture, a full duplex serial port, a precision analog comparator, on-chip oscillator and clock circuitry. In addition, the AT89C2051 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port and interrupt system to continue functioning. The power-down mode saves the RAM contents but freezes the oscillator disabling all other chip functions until the next hardware reset.

(ii) **Zigbee module**: -Zigbee is the wireless technology which can be used for long range data transfer. It requires very small power in order to function and hence can be used for long time. As it operates on a low power consumption, it is highly used in various industries like automobile, manufacturing, furnace controlled industries.

(iii) **Temperature (LM35)**: -It will sense the temperature change in the specified area and accordingly produce the output voltage. The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature.

(iv) **Smoke-Sensor**: -It is used to measure the amount of CO2 present in the air, the sensor's output voltage varies in proportion to the CO2 in air.

(v) **Metal Bomb Detector**: -It is a portable electronic instrument which detects the presence of metal nearby. They are useful for hidden metal objects or metal objects buried underground. If the sensor comes near the piece of metal, it is indicated by a change in tone in earphones or a needle moving on the indicator. The simplest form of Metal Detector consists of an oscillator producing an AC that passes through a coil of alternating magnetic field. If the piece of conductive metal is placed near the coil, eddy currents will be induced in the metals and this produces magnetic fields of its own.

(vi) **Buzzer**: -The SR buzzer will generate loud ringing from dry contact closure or analog ringing line. Loudness can be easily adjusted with a volume control knob and test button. The SR unique

sounding ring is useful for employees that often work away from the desk, allowing them to instantly recognize when buzzer is ringing. It is easy to install and comes with complete power supply and connections for an optional external speaker.

It is used to control the movement and actions of robot. By writing instructions in micro-controller and thus give appropriate command from PC or Remote we can control movement of robot such as F=forward, B= Backward, R=right, and so on. It is also used to control the machine gun by observing the picture on TV screen. It can be placed 50m away from the robot.

4. EXPERIMENTATION

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(v)**PC or Remote** :-It is used to control the movement and actions of robot. By writing instructions in micro-controller and thus give appropriate command from PC or Remote we can control movement of robot such as F=forward, B= Backward, R=right, and so on. It is also used to control the machine gun by observing the picture on TV screen. It can be placed 50m away from the robot.

(vi)**Motor Driver**:-Ld293 motor driver IC which drives two motors m1 and m2. These two motors are vehicle driver motors. Another driver IC which drives gun and camera Motors in two angles.

SOFTWARES:

Embedded C

Keil IDE

Uc-Flash

Orcad

ii. HARDWARE

Microcontroller

Zigbee Module

Wireless Camera

DC Motor & Relay

5. RESULT

We are still working on this project. In this report we have written the Theory. Results will be given in the next report.

6. CONCLUSION

In order to strengthen the security and defense of our country we desperately require robotic system which will forearm our defense system. In the recent past our world has witnessed plethora of terrorist activities and in them we had encountered tragic loss of life and property. Such humongous loss would have been avoided if we would have strong life saving robotic system in place. Hence in order to make this world a beautiful place to live we desperately require robot which will assist us in our endeavor.

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