Special Issue - 2018

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Confcall - 2018 Conference Proceedings

Design and Implementation of Invisible Border Alert System in Military Field

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Abstract:The tank's hull is attached with highly sophisticated electronic sensors which will project images of the surrounding environment back onto the outside of the vehicle enabling it to merge into the landscape and evade attack. The electronic camouflage will enable the vehicle to blend into the surrounding countryside ,the same way as the squid uses ink as disguise. Unlike the conventional forms of camouflage , the images on the hull would change based on the changing environment always ensuring that the vehicle remains disguised.

Keywords:Electronic camouflage, PIC microcontroller ,electronic sensors, MPLAB, relay.

I. INTRODUCTION

We design a tanker that will change the color pattern of its external part depending upon the environment. Every process will be handled and controlled by microcontroller-PIC series. The existing system uses EEG based monitoring in military field which is visible and difficult to find out the problems. There may be chances of accidents due to manual control and possibility of misbehaving may occur.

While this advanced system. has field instruments such as ultrasonic sensor which is used to find object movement and range. The servo motor depends on the feedback of ultrasonic sensor to turn the launching tube towards the target. Metal sensor is used to find the landmine and selection switch will design the mode to be operated.

II. BLOCK DIAGRAM
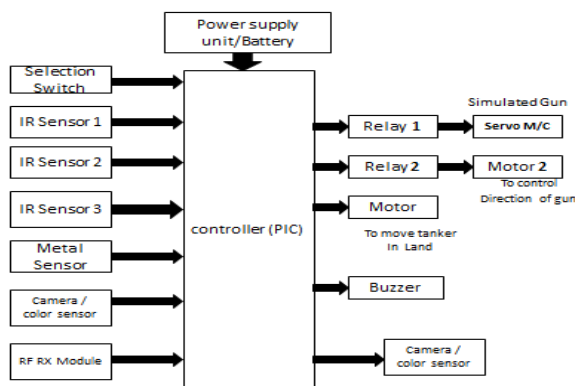
III. HARDWARE USED:

Power supply unit, PIC microcontroller.IR sensor, Servo Motor, Relay, Metal Sensor, Buzzer.

IV. POWER SUPPLY UNIT:

The power supply supplies electric energy to an electrical load. The primary function of a power supply is to convert one form of electrical energy to another and, as a result, power supplies are sometimes referred to as electric power converters. Some power supplies are discrete, stand-alone devices, whereas others are built into larger devices along with their loads.The regulated power supply accepts unregulated intputs from 9V to 15V AC or DC and gives regulated Output of 5V and 3.3V suitable for microcontroller projects which needs precise voltage to work . The input can come from power transformer or wall mount DC adapter. Since board has diode bridge input polarity does not matter .

V. PIC MICROCONTROLLER
VI.

PIC is a family of modified Harvard architecture microcontrollers made by Microchip Technology. Every PIC microcontroller has a set of registers that also function as RAM (random access memory). Special purpose control registers for on-chip hardware resources are also mapped into the data space.

IR SENSOR:

An infrared sensor is an electronic device that emits and/or detects infrared radiation in order to sense some aspect of its surroundings. Infrared sensors can measure the heat of an object, as well as detect motion. Infrared waves are invisible to human eyes. The wavelength region of 0.75µm to 3 µm is called near infrared, the region from 3 µm to 6 µm is called mid infrared and the region higher than 6 µm is called far infrarred.

VII. SERVO MOTOR

A **servomotor** is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration.**Servo motor** is a special type of motor which is automatically operated up to certain limit for a given command with help of error-sensing feedback to correct the performance.A servomotor is a rotary actuator that allows

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for precise control of angular position. It consists of a motor coupled to a sensor for position feedback. It also requires a servo drive to complete the system. The drive uses the feedback sensor to precisely control the rotary position of the motor.

VIII.   SCHEMATIC DIAGRAM
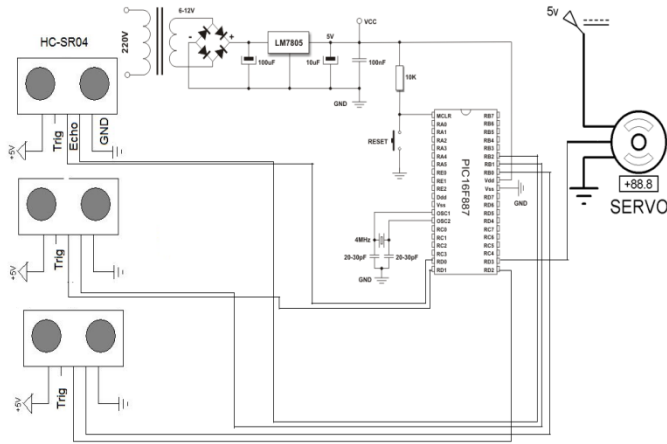
RELAY:A relay is an electrically operated switch. Relays are electromechanical devices that use an electromagnet to operate a pair of movable contacts from an open position to a closed position. The advantage of relays is that it takes a relatively small amount of power to operate the relay coil, but the relay itself can be used to control motors, heaters, lamps or AC circuits which themselves can draw a lot more electrical power   **Single channel relay**: Used to interface microcontroller with output field instruments.Operating voltage 5vdc. It leads to Electromagnetic principle. **Double channel relay**:Operating voltage 5v dc.Used to drive the motor in 2direction.

INDUCTIVE PROXIMITY(METAL SENSOR):

A **proximity sensor** is a sensor able to detect the presence of nearby objects without any physical contact. A proximity sensor often emits an electromagnetic field or a beam of electromagnetic radiation (infrared, for instance), and looks for changes in the field or return signal. The object being sensed is often referred to as the proximity sensor's target. Different proximity sensor targets demand different sensors

PUMPING MOTOR(SIMULATOR):

An electric motor is an electrical machine that converts electrical energy into mechanical energy.This is a mini submersible type water pump that works on 6V DC.This motor is small, compact and light. It can be controlled from a micro controller using our DC Motor Drivers or one of our Relay Boards. You may use our 5V SMPS Power Supply Adapter to run this pump

GEAR MOTOR:A **gear motor** is a specific type of electrical motor that is designed to produce high torque while maintaining a low horsepower, or low speed, motor output.Gear motors are commonly used in devices such as can openers, garage door openers, washing machine time control knobs and even electric alarm clocks.Gear motors are

primarily used to reduce speed in a series of gears, which in turn creates more torque

SOFTWARE   USED:MPLAB   is   a   free   integrated development environment for the development of embedded applications on PIC and dsPIC microcontrollers, and is developed by Microchip Technology.

IX.   ADVANTAGES:

Automatic decision making.
 Less man power.
 Prevents loss of human in battle field..
Online Monitoring .
Quick installation.

X.   APPLICATIONS:

Battle Field. Risky Environment. Fit for Remote mode Industry. Landmine Detector

FUTURE ENHANCEMENT: The following are the future scope of our system. Our proposed system can be further improved   and   developed   for   following   uses: The uses of devices can be further improved and the cost of the   system   can   be   further   reduced. By the improvement of technology, the system can also be made   useful   for   the   various   application   fields. This system can be improved and designed in order to decrease the human loss in war field.   This system can be further improved in design to detect chemical explosives.

XI.   CONCLUSION:

Sophisticated tanker system have many advantages over the traditional way of targeting in military tanker. Some of these advantages are lesser cost, fast tabulation of results, improved accessibility, greater accuracy, and lower risk of human and mechanical errors. We tried our level best to introduce a new tanker system that will be invisible, accurate, transparent, fast and will ensure a safe military system

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