

Hybrid Self Powered Vehicle for Border Surveillance

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ABSTRACT

The Idea Deals With The Surveillance Of Borders So As To Detect And Defend If any Attack Was Initiated . The Modern War Fields Are More Susceptible To Toxic Gases Than Destructive explosions .So, A Robot Is Employed To Detect The Presence Of Any Toxic Gases, Using Gas sensors And Smoke Sensors With A Camera To Monitor Without Being directly Affected By Such Gases So That Necessary Steps Can Be Taken To Face the Problem As Well As Preventive Measures For Future Is Planned. The Hybrid Vehicle Doesn't Have Any Need of Recharging As It Uses Solar energy And Wind Energy For Automatically Charging In The Field When Possible.

Keywords : Border Surveillance, Self Powered Vehicle, Toxic Gases

I. INTRODUCTION

Pollution Problems And Their Effects On The Environment In The Long Term With The Increasing Of Climate Like Global Warming, Continue To Worry Vehicle Manufacturers .

Nowadays, Much Research Has Been Focused On Minimizing The Exhaust Of Carbon Dioxide .

Solar Vehicle Usage Is A Promising Solution Because Of Its Economical And environmental Benefits.

The Solar Vehicle Combines, In Addition To Its Main Energy Source (Photovoltaic), Reversible Energy Storage Devices Iike Supercapacitors, And Batteries.

The Obtaining Of The Above Mentioned Features Guarantee A Great Efficiency, Good Improvement Of Acceleration And A High Throughput In Charge During Regenerative Braking. And Consequently, It Can Lead To Higher Efficiency In Overall Solar Vehicle Driving, And Longer Driving Range

This Technique Was Developed Successfully In Many Applications Like ,

- ✓ Pure Battery-Powered Electric Vehicle

- ✓ Solar Vehicle By Integration Of Supercapacitors

Previously used techniques

- ✓ Manual Practice Have Flaws Of Direct Exposure To Toxicity.
- ✓ So Difficult For Treatment.
- ✓ Static Cameras Are Only Used.

Current technique

- ✓ Camera is mounted to the robot.
- ✓ Embedded system based control. Hence optimised for automation.
- ✓ Direct exposure to human entity is prevented.

Technology Used

- ✓ Embedded System
- ✓ Renewable Energy Systems

Applications

- ✓ Toxicity Detection In Environment.
- ✓ Security And Surveillance Applications.

II. METHADALOGY

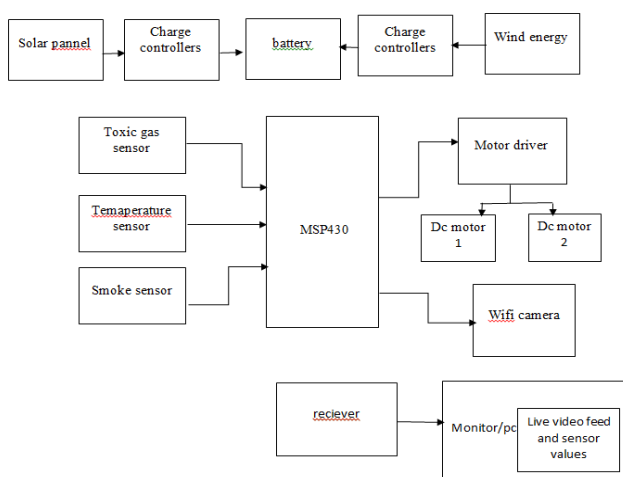


Figure 1

III. TECHNOLOGY

Our project utilises these main components for greater efficiency,

3.1 WIFI Camera

- ✓ Watch, talk and listen from anywhere with live video and 2-way audio
- ✓ Stay in the know with real-time motion and noise notifications
- ✓ Manage and watch all of your cameras from one place
- ✓ See clearly in the dark with Advanced Night Vision
- ✓ Record, watch & download video from the cloud with flexible recording options

SPECIFICATIONS For Wifi Camera

- ✓ Video: Up To 720p HD
- ✓ Field Of View: 110°
- ✓ Digital Zoom: 10X
- ✓ Total Output Power: Up To 900mw
- ✓ Amplifiers: Transmit And Receive
- ✓ Antenna: High Gain, External 3.5dbi
- ✓ Long Range Night Vision: High Power Infrared LEDs
- ✓ Audio: 2-Way (Microphone and Speaker)
- ✓ Power: 5V DC, 2A

3.2 MSP430

- ✓ This is a 16-bit, RISC- based, mixed-signal processor. MSP430 MCUs have the right mix of intelligent peripherals, ease-of-use, low cost and lowest power consumption for thousands of applications.
- ✓ The MSP430 MCU is designed specifically for ultra-low-power applications. Its flexible clocking system, multiple low-power modes, instant wakeup and intelligent autonomous peripherals enable true ultra-low-power optimization, dramatically extending battery life. MSP430 MCUs are highly integrated and offer a wide range of high performance analog and digital peripherals
- ✓ Typical Applications Include Embedded And Sensor Systems

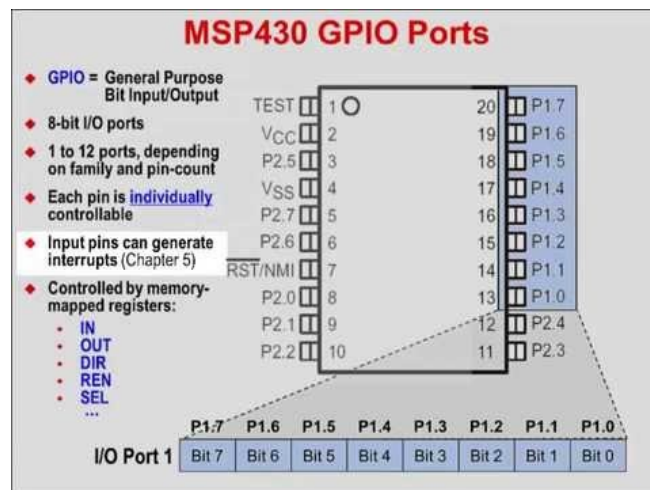


Figure 2

SENSORS USED

The three main sensors used here are as follows,

Toxic gas sensor: Electrochemical sensors or cells are most commonly used in the detection of toxic gases like carbon monoxide, chlorine and nitrogen oxides. They function via electrodes signals when a gas is detected

Temperature sensor: Temperature Sensing Can Be Done Either Through Direct Contact With The Heating Source, Or Remotely, Without Direct Contact With The Source Using Radiated Energy Instead.

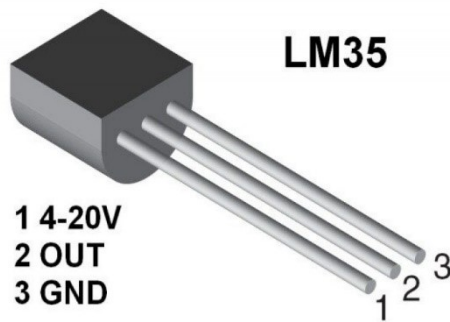


Figure 3

Smoke sensor: Smoke Detectors Are Housed In Plastic Enclosures, Typically Shaped Like A Disk About 150 Millimetres (6 In) In Diameter And 25 Millimetres (1 In) Thick, But Shape And Size Vary. Smoke Can Be Detected Either Optically (Photoelectric) Or By Physical Process (Ionization); Detectors May Use Either, Or Both, Methods.

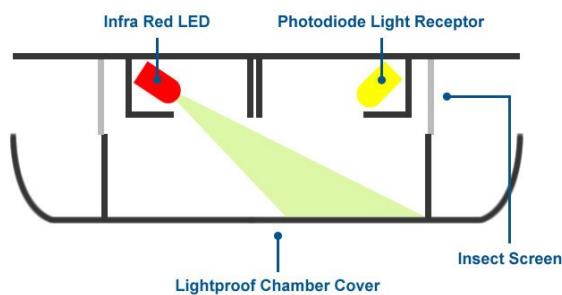


Figure 4

Apart From The Above Mentioned Components Battery, Solar Panel, Dc Motors, A Pc For Monitoring The Vehicle Are Also Used. Two Dc Motors Are Used Here And The Solar Panel Will Produce Power During Daytime.

IV. RESULTS AND DISCUSSION

The Surveillance Vehicle Is Parked On The Required Place For Testing. First The Vehicle Is Allowed To Charge By Itself. As We Discussed Earlier This Vehicle Is Capable Of Charging Both By Wind And Solar Energy. During Day Time The Source May Be Taken In The Form Of Sunlight And Depending

Upon The Pressure Of Air, Wind Energy Will Also Be Used. If The Force Of The Wind Is Pretty Low The Vehicle Will Produce Upto 2V.If The Pressure Of The Wind Gets Increased It Will Go All The Way Upto 12v.Since The Used Microcontroller(MSP430) Is Very Power Efficient, Charging And Battery Life Should Not Be A Issue Here. The Software Used Here Is Energia Which Is A Open Source Electronics Prototyping Format. A Receiver Along With A Pc Is Used To Monitor The Vehicle From Far Distance. All The Three Sensors Should Be Properly Checked Before Installation. If Any Toxic Gas Is Leaked By Our Rivals And The Level Of Gas Goes Beyond A Certain Level, The Gas Sensor Will Detect It And Warns Us Through Receiver So That Necessary Action Will Be Taken By Us.

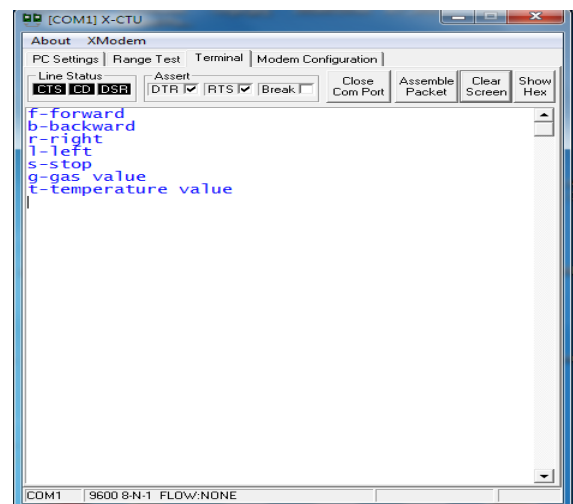


Figure 5

V. FUTURE SCOPE

Having implemented this project gives us the security in border using MSP430,sensors and batteries. also it can be further developed by enhancing the sensor range and DC motor. high quality WIFI cameras should be used in order to get more accurate output through monitor.

VI. CONCLUSION

Thus Our Project Aims To Survive Our Border By Detecting The Toxic Gases And Fire Using The Required Sensors. Moreover, The Vehicle Will Be

Powered By Itself Using Wind And Solar Energy. Our Project Has Been Constructed By Keeping Our Border Security As Main Theme.

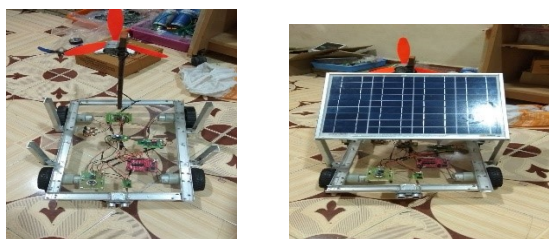


Figure 6

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