ART TRACKER

Vikas A. Chandanshive
Department of electronics
and telecommunication
Sandipani Technical campus.
Latur India.

Muzammi l Pathan
Department of electronics
andtelecommunication
Sandipani Technical Campus.
Latur ,India.

Prof.G.V. Chalkikar sir
Department of electronics
and telecommunication
Sandipani TechnicalCampus.
LaturIndia.

ABSTRACT:-

   GlobalPositioningSystem(GPS)isbecomingwidelyusedfortrackingandmonitoringvehicles.ThesystemhasbeenusefortrackingCollegeBusinrealtimeusingGPRS(GeneralPacketRadioService)technology.Thesystemsprovidethepossibilityoftrackingthelocationofvehiclesatanaffordablecost.AvehicletrackingsystemcanbeenablesthefleetoperatortofindoutthelocationofthevehiclethroughoutthejourneyoftheCollegeBus.

   ThesystemhasprovidedGPSGPRSbasedCollegeBustrackingsystem.ThecurrentpositionofthevehiclehasbeenacquirebyGPSdevicewhichisintegratingintothetargetvehicleandthelocationcoordinatescansentthroughGPRS,itprovidebytheGSMnetwork.TheGPSreceiverisusedtogivelatitudeandlongitudeofthecurrentlocation.TheproposedsystemcanbebuiltusingthemicrocontrollerAtmeg328PAU.Thisistheheartofthesystem.TheGPSreceiverconnectingtomicrocontrollerthroughtheserialportandusedtoobtainthecurrentlocation.TheGPSreceiveracquiresthecurrentpositionofthelocationandthisinformationofCollegeBusPublishtoCloudMqttserveronaspecificTopicusingGPRSModule.GPRSprovideTCP/IPconnectionwithCloudMqttserver.ClousMqttserverreceivesCollegeBuslocationinformationvianetworkandstoresthisinformationindatabase.ThisinformationisavailabletoauthorizeduserswhoSubscribetheTopiclikeNode-RedWebAppandAndroidMobile.

Component:
1.Electrow SIMduino (UNO+SIM808)
2.GPS
3.GSM

I. INTRODUCTION

   Due to the continuous increase in the cost of fuel and the effect of emission of gases from the burnt fuel into the atmosphere, this necessitated the use of the abundant solar energy from the sun as a source of power to drive a lawn mower. A solar powered lawn mower was designed and developed, based on the general principle of mowing. The designed solar powered lawnmower comprises of direct current (D.C) motor, a rechargeable battery, solar panel, a stainless steel blade and control switch. Moving is achieved by the D.C motor which provides the required torque needed to drive the stainless steel blade which is directly coupled to the shaft of the D.C motor. The solar powered lawnmower is operated by the switch on the board which closes the circuit and allows the flow of current to the motor which in turn drive the blade used for mowing. The battery recharges through the solar charging controller. Performance evaluation of the developed machine was carried out with different types of grasses. The machine was found to have an efficiency of 93% and a field capacity of 1.11×10^{-4} ha/hr. No significant difference was observed with the height of grasses at 5% confidence level.

LITERATURE SURVEY

   Real-time tracking and management of vehicles has been a field of interest for many researchers and a lot of research work has been done for tracking system. Recently the various anti-theft modules like steering wheel locked equipment, network tracking system and traditional electronic alarm are developed along with client identification and real time performance monitoring. The paper presented by El-Medany, W.; Al-Omary et al describes a real time tracking system that provides accurate localizations of the tracked vehicle with low cost. GM862 cellular quad band module is used for implementation. A monitoring server and a graphical user interface on a website is also developed using Microsoft SQL Server 2003 and ASP.net to view the proper location of a vehicle on a specific map. The paper also provides information regarding the vehicle status such as speed, mileage.

   [1] Hu Jian-ming; Li Jie; Li Guang-Hui describes an automobile anti-theft system using GSM and GPS module. The system is developed using high speed mixed type single-chip C8051F120 and stolen automobile is detected by the use of vibration sensor. The system remains in contact with automobile owner through the GSM module, for the safety and reliability of automobile.

[2] Fleischer, P.B.; Nelson et al describes development and deployment of GPS (Global Positioning System)/GSM (Global System for Mobile Communications) based Vehicle Tracking and Alert System. This system allows inter-city transport companies to track their vehicles in real-time and provides security from armed robbery and accident occurrences.

 [3] Le-Tien, T.; Vu Phung describes a system based on the Global Positioning System (GPS) and Global System for Mobile Communication (GSM). It describes the practical model for routing and tracking with mobile vehicle in a large area outdoor environment .The system includes the Compass sensor-YAS529 of Yamaha Company and Accelerator sensor-KXSC72050 of Koinix Company to acquire moving direction of a vehicle. The system will acquire positions of the vehicle via GPS receiver and then sends the data to supervised center by the SMS (Short Message Services) or GPRS (General Package Radio Service) service. The supervised center comprises of a development kit that supports GSM techniques-WMP100 of

the Wavecom Company. Finally, the position of the mobile vehicle will be displayed on Google Map.

Aim And Objectives

A. Aim:

The main aim of this project is to implement real time human beings security by ART Tracker system in public places which aims to provide the 100% safe environment.

B. Problem Statement:

This paper focuses on a security system that is designed solely to serve the purpose of providing security to human beings so that they never feel helpless while facing such social challenges. The system resembles a normal cloves which when activated, tracks the location of the Bus , vehicle, truck, car, etc using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication) to server for example mobile , laptop , Computer etc this are we check the location of bus or any vehicle.

C. Objectives:

1. To make school , collages safety.

2. The purpose of providing security and safety to human bings so that they never feel helpless. Andevery persone is trac the bus , car by help of this project.
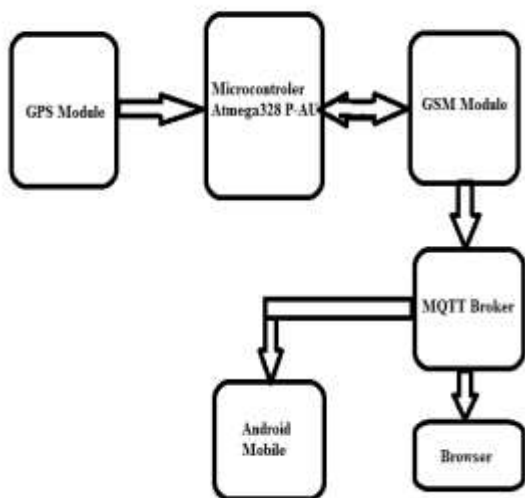
BLOCK DIAGRAM

Fig 2.1 Block Diagram of ART Tracker

GPS module is used to receive GPS Signals from GPS satellite those signal in form of   NMEA format Which is comma separated the output of GPS Module is given to Arduino uno. Arduino UNO process on the GPS Signals and convert it into a CSV string .The CSV string content GPS coordinate latitude and longitude are than Publish to MQTT Broker using GSM Module .

MQTT (MQ Telemetry Transport or Message Queuing Telemetry Transport) is an ISO standard (ISO/IEC PRF 20922) publish-subscribe-based messaging protocol. It works on top of the TCP/IP protocol.

MQTT Broker is Cloud based Server. we can Publish the GPS data from our Art Tracker.

The GPS data is publish through a topic .The publish data can be Subscribe Using Android Mobile or Using any Browser.

1. Electrow SIMduino (UNO+SIM808)

Fig. SIMduino V2

The Electrow Simduino combines Arduino uno and sim808 module. It will save more cost and space for your project and easier to build other modules. It not only by DC power supply, we have designed a battery interface for it, you can also use a 3.7V lithium battery to power it. Whether you want to get a Arduino or a SIM808 module, even start a SIM808 related application that base on Arduino. It will make your satisfaction. Come on and add it to your shopping cart.

Same as the Arduino UNO, the SIMduino also has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, a reset button, and of course, a Mini USB cable, simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

1.1. Feature

- UNO+SIM808,TWO in one board
- Flat DC Jack.
- Inherits all of Arduino Uno's features.
- Compatible to Uno's pin layout, screw hole and dimensions.
- Evolved with SMD components.
- Quad-band 850/900/1800/1900MHz
- GPRS mobile station class B
- Controlled by AT Command (3GPP TS 27.007, 27.005 and SIMCOM enhanced AT Commands)
- Integrated GPS/CNSS and supports A-GPS
- Low power consumption, 1mA in sleep mode
- Supports GPS NMEA protocol

- Standard Micro SIM Card
- GPRS multi-slot class12 connectivity: max. 85.6kbps(down-load/up-load)
- Indicator LEDs for power and network connectivity
- uFL connection for external passive GPS & external GSM antenna
- Any standard 2G SIM slides into a secure connector
- Standard 4-pole TRRS headphone jack. Use any 'Android' or 'iPhone'-compatible headset with mic

GSM

GSM (Global system for mobile communication) is a globally accepted standard for digital cellular communications. The concept of GSM emerged from a cell-based mobile radio system at Bell Laboratories in the early 1970s.GSM is the name standardization group established in 1982 to create common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900MHz. GSM uses narrowband Time Division Multiple Access (TDMA) for providing voice and text based services over mobile phone networks.

GSM is a circuit-switched system that divides each 200 kHz channel into eight 25 kHz time-slots. GSM operates on the mobile communication bands 900 MHz and 1800 MHz in most parts of the world. In the US, GSM operates in the bands 850 MHz and 1900 MHz.GSM owns a market share of more than 70 percent of the world's digital cellular subscribers. GSM was developed using digital technology. It has an ability to carry 64 kbps to 120 Mbps of data rates.

GPS

GPS stands for Global Positioning System by which anyone can always obtain the position information anywhere in the world.GPS was initially meant for military applications and was built by the American Department of Defence (DOD) in 1978. It was originally called NAVSTAR and was introduced with the launch of the first satellite. GPS technology became a reality through the efforts of the American military, which established a satellite-based navigation system consisting of a network of 24 satellites orbiting the earth. GPS is also known as the NAVSTAR (Navigation System for Timing and Ranging).

The Indian Regional Navigation Satellite System or IRNSS with an operational name of NAVIC ("sailor" or "navigator" in Sanskrit, Hindi and many other Indian languages, which also stands for NAVigation with Indian Constellation) is an autonomous regional satellite navigation system that is being set up by India, that will be used to provide accurate real-time positioning and timing services over India and the region extending to 1,500 kilometres (930 mi) around India. The NAVIC system will consist of a constellation of 3 satellites in Geostationary orbit (GEO), 4 satellites in Geosynchronous orbit (GSO), approximately 36,000 kilometres (22,000 mi) altitude above earth surface, and two satellites on the ground as stand-by in addition to ground stations.

Advantages of ART Tracker

1) **Increased Child Safety** – GPS tracking keeps track of College buses in real time, notifying parents of the specific arrival times. This reduces the amount of time children have to wait for buses to arrive, minimizes their exposure to inclement weather, and various other dangers they can be exposed to while waiting for a school bus to arrive. GPS tracking devices also notify fleet managers when bus drivers engage in unsafe behavior, such as reckless driving and entering no-go zones.

2) **Parental Monitoring of College Buses Arrivals and Departures** – Sending children on a bus can be a source for anxiety for parents. GPS tracking devices can help to eliminate this anxiety by allowing parents to keep a watchful eye on the arrival and departure of their child's College bus. By knowing the arrival and departure times of their child's College bus by SMS, parents can have increased peace of mind.

3) **Track Bus Fuel Costs** – By keeping track of mileage and the routes that drivers take, Collage bus fleet managers can track and better manage fuel costs. Managers can ensure drivers are efficiently driving their buses, that they are observing speed limits and that they are staying on their scheduled routes.

4) **Track Bus Driver Driving Behaviors** – Manager will be able to keep tabs on the behavior of their drivers with GPS fleet tracking. These devices keep track of driving patterns and behaviors, like hard braking, unnecessary idling and speeding. This not only reduces costs, but it also improves passenger safety.

5) **Improve Ecological Accountability** – With GPS tracking devices, routes can be better optimized and engine idling can be minimized. Both of these things reduce the impact buses have on the environment by lowering the amount of emissions they put out into the atmosphere.

6) **Improved Scheduling for College** – By knowing exactly when College buses will arrive and depart, school administrators and teachers can create better and more effective schedules for their students. This allows for better time management and more fluidity of the school day.

Applications

1) Locating Positions
2) Easy Access to Emergency Road Side Support
3) Preventing Car Theft
4) Mapping and Surveying
5) Tracking for Law Enforcement
6) Locating Your Pets
7) Keeping Watch on Elderly People
8) Finding Treasure
9) Mining

10) Securing Artworks
11) Hiking and Backpacking
12) Solo Travels
13) Flying Planes
14) Fleet Tracking
15) Hunting and Fishing

CONCLUSIONS & FUTURE SCOPE

Conclusion

The main objective of the project was to develop a GPS tracking system hat Publish a set of gi ven parameter to a data Cloud Mqtt server through a GPRS and moniter on map using Node-Redwebsite where it can be viewed remotely.

Future Scope

As the technological changes or new requirement from user to enhance the functionality of product may requires new version to introduce. Although the System is complete and working efficiently, new modules which enhance the system functionality can be added without any major changes to the entire system. By keeping this ability of the product I mind, an incremental process model has been used to design and develop the system. Among the various modules few are identified, which couldn't be included in the last increment due to time constraints. These are as follows :

1. Primary School Children Safety

2. Vehicle Safety System Module

3. Mobile and other valuables Safety System

   Module

REFERENCES

[1]SIM808ATCommandManual_Version1.01bySI MComTechcompany,China,2011

[2]SIM908HardwareDesignManual_V2.00bySIM ComTechcompany,China,2013

[3]SIM908 Reference Design Guide_Application Note_Version 1.00 by SIMCom Tech company,China,2011-08-10

[4]www.ijcset.net- WEBBASEDVEHICLETRACKINGSYSTEMbyKha lifaA.Salimetal| IJCSET|December2013|Vol3,Issue12,443- 448|ISSN:2231-0711443IV.

[5]http://www.radioelectronics.com/info/cellulartelecomms/ gsm_technical/gsm_architecture.php

[6]https://cdnshop.adafruit.com/datasheets/SIM808_Hardwa re+Design_V1.00.pdf

[7] http://www.atmel.com/Images/Atmel-42735-8-bit-AVR-Microcontroller-ATmega328-328P_Datasheet.pdf

[8]https://www.cloudmqtt.com

[9]https://bluemix.net

[10] https://nodered.org/