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BLOCKCHAIN TECHNOLOGY FOR SECURING AND MANAGING LEDGER DATA BASE IN OIL AND GAS INDUSTRIES

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Chapter -1

INTRODUCTION

Oil and gas (petroleum production) have been important sources of income, vitality and industry for the national economy and production in recent decades [1]. Nigeria is one of the eleven countries in the Organization of the Petroleum Exporting Countries (OPEC) with the highest ranking in exports of petroleum products [2]. However, the distribution of this commodity in Nigeria has proven to be very challenging for many years, causing major economic fluctuations in the region. Among them are carbon shortages, oil and gas hijacking, market growth and other issues. In Nigeria, interruptions in the supply of this combustible resource are a common occurrence because of the large number of problems with its delivery. In addition to other professional activities in the marketing supply chain, Aminu et al. Petroleum products (oil and gas) are primarily essential energy resources worldwide, and are a major part of the economies of most developing countries, such as the United States, the United Arab Emirates, and Saudi Arabia. . [3]. Weakness of treatment due to corruption, bribery and lack of accountability between the supply chain and the delivery phase parties is one of the explanations for the shortage of goods in the country [4]. The use of manual transactions, intentional destruction of structured distribution ledgers and piping network delivery has been associated with fraud, theft and misuse in the distribution process [5]. Although the previous transaction log was classified as Illustrated Ledger (3200 BC), it is the transaction record used by each business entity to store records over the past century [6,7]. Computerized spreadsheets are more advanced technology for storing documents in worksheets. This digital ledger was established as the Central Ledger, which is subject to manipulation as well as abuse and fraud. Centralized control and misuse are two other factors that have contributed to the creation of block-chain cryptographic methods presented in this study for the management of decentralized ledger framework. Block-chain has Bitcoin-supported infrastructure [8], advanced guidance services capable of influencing financial transactions, and benefits such as accountability, accurate tracking, permanent ledger, cost avoidance and record storage [9]. With Time Stamped Digital Archives, block-chain technology is a solution for digital trusts in record keeping and knowledge management.

[10] Open and independent distribution storage block. Block-chain is a distributed block-chain network that expands and operates across multiple organizations and is not tied to a central control point [11,12]. The information is allowed to be updated,but the collected historical details will not be updated or changed without the permission of the network participants. The administrator of a unit of a distributed network may not modify or modify the data collected in the block-chain without the permission of other network members. Distribution, reliability, durability, durability, accountability and resilience are just some of the key advantages of block-chain [13]. The block-chain platform has been widely implemented as a defensive defense against security threats and cyber attacks related to the Internet of Things (IoT) and software defined networking (SDN) [14]. Vera et al. Propose man-in-the-middle (MITMA) attacks on software-defined networks using block-chain technologies, such as exposure to bogus laws for security competition and as shown in Figure 1 [15], the scheme uses cryptographic strategy to detect illegal attempts to achieve credibility. Raising lightweight weight and block-chain technologies with open flow rules built on software-defined networks. The results of the proposed BLOOSTER system show that tampering and theft can be detected with a 100% detection rate in a limited time. In the banking sector, block-chain technology showcases the potential and progress(including stability, privacy and transparency) of databases based on traditional demographic data management, electoral voting system management and e-commerce transactions.

1.1 EMBEDDED SYSTEMS:

Am embedded device is a computer system programmed to perform one or more specific tasks, sometimes with limited time. It is often used as part of a larger device that contains hardware and mechanical components. On the other hand, a multipurpose device such as a personal computer (PC) can cater to a wide range of end-user needs. Many modern devices are controlled by embedded systems.

One or more major processing centers, usually microcontrollers or optical signal processors and embedded power equipment (DSP). The solution is simple.

However, commitment to a specific purpose, which requires very powerful therapies, is symptomatic. Although there are large computers and dedicated regional and national networks between airports and radar sites, air traffic control systems, for example, can be considered embedded. (Each radar has one or more systems.)

Since the embedded device is committed to a single function, design engineers can optimize it to reduce product size and cost while increasing its efficiency and productivity. Embedded devices are often mass-produced to take advantage of economies.

Physically integrated structures range from small portable devices such as digital clocks and MP3 players to bulk fixed structures such as traffic lights, warehouse controls and control systems for nuclear power plants. With a chip microcontroller, the complexity is low; Since most modules, peripherals and networks are installed in a large structure or premises, complexity is very important.

In general, the concept of an "embedded device" is a very difficult concept because most devices are expandable or programmable in any way. Laptops, for example, share some operating systems and microprocessors with built-in systems, but often allow different programs to load and add peripherals. In addition, the inclusion of software that does not declare programmability as a primary requirement necessarily agrees with software updates. Wide application architectures have subcomponents at specific points from "general purpose" to "built-in", although the whole device is "designed to perform one or more temporary tasks", which fits the term "built in". -In". Figure 1.1 describes the general representation of a compact machine.

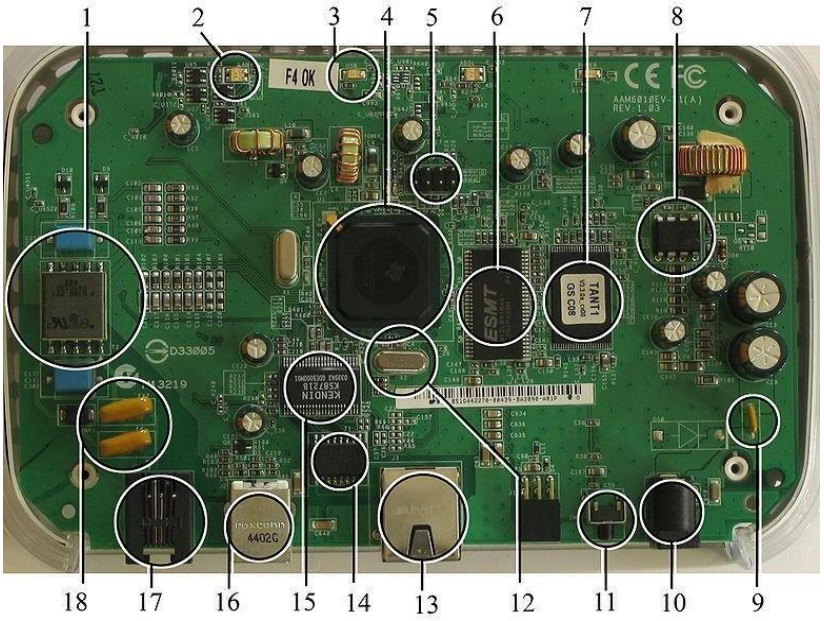


Fig1.1: A modern example of embedded system

The microprocessor (4), random access memory (6) and flash memory are all important components (7). Programming for embedded devices is different from programming for a computer. Programming for an embedded device is similar to programming for a computer fifteen years ago. System hardware is usually chosen to keep the computer as inexpensive as possible. The device can cost up to a million dollars to facilitate programming. In contrast, hiring a programmer for an extra month is a bargain. This ensures that the programmer works with slow processors and limited memory, with the desire for unconventional reliability in computer applications. Below is a set of issues specific to the embedded sector.

1.1.1 HISTORY

Computers in the 1930s and 1940s were often dedicated to a specific task, but they were too large and expensive for most of the activities that compact computers do today. However, programmable controls have evolved over time, from traditional electromechanical sequencers and solid-state systems to digital technologies.

The Apollo Guidance Computer, designed by Charles Stark Draper at the MIT Instrumentation Lab, is the first of the modern embedded systems. The Apollo guiding machine was considered the most dangerous object during the creation of the Apollo projrct because it used a newly built device at the time.

Monolithic integrated circuits are used to reduce the scale and weight of integrated circuits. The Autonetics D-17 pioneer computer for the Minuteman missile, launched in 1961, was the first mass-produced compact machine. It has a hard disk for primary memory and is made with transistor logic. When Minuteman II was introduced in 1966, the D-17 was replaced by a modern device that was the first to use integrated circuits on a large scale.

1.1.2: Tools

Embedded programming is a finite part of the whole programming. Unlike the PC environment, where only one reference is governed and the Unix world, there are only three or four of them, there are many different types of built-in structures. As a result, accessories are more expensive. It also means less sophisticated and less premium. Often any kind of compiler error is found at some point in a large embedded project.

Another thing is software correction. You can not really run a debugger on your built - in processor and you can not always run regular programs on it. It is impossible to debug the program. JTAG ports and other specialized devices may help partially resolve this issue. When the machine is controlling the machines in the real world (likethe engine), stopping during stopping can cause permanent damage to the machine. Asa result, the included programmers quickly became experts at using serial input and output channels and debugging errors with error messages.

1.1.3: Resources

The included devices often use the cheapest processors available to save money. As a result, requests should be written as quickly as possible. Loss of cache memory, which is not important in computer programming, can damage you when working with large data sets. Fortunately, this does not happen often; Instead, start with the most powerful algorithms and optimize only when needed. Standard recognition tools, including correctors, may not fit properly in this situation.

Memory loss is also a problem. Typically, embedded devices have disposable memory for low cost purposes. As a result, their algorithms need to be memory- friendly (unlike PC software, you are sacrificing more processor time for memory than any other means). It also means that you are not able to do that.

Memory leak is inevitable. Programs that are included to stop using the "New" and "Malok" default functions to facilitate the detection and resolution of memory leaks typically use critical memory methods. There are no other tools that programmers expect. Most integrated processors, for example, do not have FPUs (floating point processing unit). These tools should be emulated in programs or avoided altogether.

IMMEDIATE PROBLEMS:

Embedded systems monitor devices regularly and be able to receive them in real time. Failure to do so may result in measurement errors or damage to machines such as motors. The shortage of available funds makes this even more complicated. Almost all embedded systems should be able to prioritize certain activities over others, as well as defer or miss tasks that are less important than the user interface than high-priority tasks such as hardware power.

1.2 IMPORTANCE OF EMBEDDED SYSTEMS:

As new technologies that use embedded computers in innovative ways are being launched in the market every day, applications for embedded systems are practically limited. Hardware such as microprocessors, microcontrollers and FPGA. Please purchase a shared chip when introducing the new control mode and write your custom software for it. It takes a lot of time and a lot of money to produce a chip dedicated to performing a specific task or sequence of tasks. Most built-in computers have large packages that make "writing your own software" a very simple process. There is a big difference between a machine and a compact machine in terms of implementation. Embedded systems are often expected to respond in real time. The main features that distinguish embedded systems are their reliability and ease of debugging.

1.2.1 TOOLS

The included correction can be made at different speeds depending on the resources available. They can be divided into the following categories from basic to more complex:

Debugging interactive evaluations using embedded OS architecture (such as Forth and Basic) External monitoring by recording or outputting a serial port to track

activity using a debug server such as Flash Flash Display or Remedy Debugger, which also works with different multi-core systems.

A computer that uses the JTAG or Nexus protocol to link to an in-circuit debugger (ICD), microprocessor. This allows the output of the microprocessor to be monitored from the outside, but is usually limited by the processor's ability to correct errors.

The in-circuit simulator replaces the virtual microprocessor for a real processor, giving you full power over the microprocessor.

Hardware is a complete simulation that emulates all aspects of hardware, all of which allow monitoring and modification and error correction on a standard PC.

If external debugging is not required, the programmer will usually download the program, run it through the device, view the code running on the processor, and enable or disable it. Programming can be thought of as compilation code or source code.

Because the embedded device has a wide variety of components, debugging strategies may vary. Central embedded device (and microprocessor) debugging is different from inline system debugging, where most of the mathematical operations (DSP, FPGA, co-processor) take place on those peripherals. Embedded systems with more than one core processor are becoming more popular. Proper synchronization of program execution is a common problem in multi-core development. In this scenario, the embedded device architecture chooses to check the traffic on the processor core buses, which requires a very low-level error correction such as a logic analyzer at the signal / bus level.

1.2.2 RESPONSIBILITY:

Hardware built into computers that are supposed to work without errors is often used for years and in some cases, they recover on their own when an error occurs. As a result, the software is generally built and more fully authenticated.

Defective electronic moving parts such as keys and switches, as well as drives, can be avoided on personal computers.

Here are some examples of specific reliability issues:

- It is not possible to safely turn off the device for repairs, or it will be difficult toaccess.

Equipment must be maintained for safety purposes such as space aerospace

networks, seabed wires, navigation lighthouses, drilling systems and vehicles. Less likely "limp conditions." The player always selects backups. The machine wastes a lot of revenue if it is shut down: Examples include flight guidance, nuclear controllers, chemical plant controls critical to safety, train signals, and single-engine aircraft engines. Telephone switches, warehouse systems, bridge and elevator controls, money transfer, market manufacturing, automatic sales and services are examples of automated sales and services.

- To recover from errors - both software leaks and software vulnerabilities, including software hardware errors - a variety of methods are used, which are often combined.
- By Guard Timer that resets the device if not notified by the program on a daily basis.
- Sp are spare parts that can be converted into program "limp modes" that contain partial functions.
- A system embedded hypervisor can provide consistent encapsulation to every part of the subsystem, preventing corrupted software from interfacing with other subsystems or premium-level device software. This prevents encapsulation errors from spreading from one subsystem to another, resulting in increased efficiency. Immuno-conscious programming allows a subsystem to shut down immediatelyand restart when an error is detected.

1.3 EXPLANATIONOFEMBEDDEDSYSTEMS

1.3.1 Software Architecture: Different types of software architecture are in usetoday.

Basic control loop:

The program is basically a link in this design. Loop calls for sub-policies, each of which is responsible for a specific aspect of the hardware or software.

County Control System:

Some built-in systems rely heavily on interrupt control. This ensures that system processes are activated by a variety of events. The timer may, for example, interrupt a predetermined period of time or receive a serial port controller byte. Event handlers require less delay and when faster and faster, these types of systems are used.

In some cases, these systems often trigger the primary operation in the main loop, but this role is not subject to unnecessary delay. More characters are often added to the roster system by the interrupt controller. These functions are performed by the main loop after the interrupt handler is complete. This approach predicts a multi- tasking kernel for specific in-framework processes.

Multi-tasking in a group:

The non-proactive multi-tasking framework is compatible with the basic control loop diagram, unless the loop is protected behind the API. The programmer creates a set of functions, each of which has its own environment to "work". When the function is inactive, it initiates a passive routine, commonly called "stop", "wait", "return", "no" (no process). The advantages and disadvantages are close to the control loop, unless the execution of additional functions is faster, which can be done by writing a new job or adding to the queue compiler.

Multi-tasking in its most primitive form:

Part of the low-level code in this window rotates between tasks or threads centered around the timer (connected to the interrupt). This is the degree to which the kernel of the "operating system" is considered normal. This adds more or less complexity in performing many operations that are conceptually running in parallel, depending on the amount of activity required.

Programs need to be carefully planned and monitored and access to shared data can be managed through synchronization, technology, such as message queues, bookmarks, or unblocked synchronization, so that theoretically any code could harm other important data (except large systems using MMU).

Because of these complexities, it is common for companies to purchase a real-time operating system that allows application programmers to focus on hardware functionality, at least on larger systems, rather than on OS services. On the other hand, even small systems cannot withstand the overheads associated with a normal system due to memory size, performance, and/or bandwidth limitations.

Exocornels vs. Microkernels:

The next logical step after the microkernel real time operating system. The kernel of the operating system usually allocates memory and moves the CPU between different threads. File systems, network interfaces, and other key features are implemented through user mode operations.

Microkernels work best when communication between task switching and tasks is fast and they are difficult when delayed. Exocernals use standard subcutaneouscalls to interact effectively. Software programmers can access system hardware and applications and expand them. The included systems are divided into three groups based on capacity, availability and requirements.

1.3.2 INFRASTRUCTURE STANDALONE LISTED:

These systems receive instructions from transducers in the form of electrical signals or from humans pressing buttons and processing them to achieve the desired output. In standalone mode, the entire process of taking, processing and generating output is completed. These compact systems are classified as compact stand-alone systems, for example, microwave ovens and air conditioners.

1.3.3 REAL TIME EMBEDDED SYSTEMS:

Real time embedded systems are embedded system that are used to perform a specific process or activity over a specific period of time. Real time embedded systemsfall into two classes.

1.3.4 CHALLENGING EMBEDDED REAL TIME SYSTEMS:

These included devices have an absolute expiration date, which means that if the job is not completed within a certain period of time, all equipment will be damaged.

Take for example the device that should open the valve in 30 milliseconds. If this valve does not open within 30ms the whole system will be damaged. As a result, we use embedded devices to perform automated operations in these situations.

Built-in smooth real-time systems:

These compact systems operate within the relative duration of the death line, meaning that even if the job is not completed within a certain period of time, the equipment is damaged.

Consider a TV remote control system: If the remote control takes a few milliseconds to interact, the TV or remote control will be damaged. Real-time embedded softdevices are structures that will not be damaged if not used for a long time.

1.3.5 INTEGRATED NETWORK COMMUNICATION SYSTEMS:

Embedded devices have a variety of network interfaces. Discover how a webcam connected to an Internet-connected device can be used to deliver communications, such as sending photos, pictures, and video clips to another computer using an Internet link somewhere in the world. Lock Consider installing a webcam when the door is locked.

Fig1.2: Network communication embedded systems

When someone approaches the entrance, the camera takes a picture of them and transmits it to the desktop of the computer connected to thee Internet. It displays a warning message with an icon on your computer screen and you can unlock the door by clicking the button.

1.3.6 DIFFERENTTYPESOFPROCESSINGUNITS:

- The central processing unit (CPU) can be a microprocessor, a microcontroller, or a computer signal processor. Among them: memory, serial interfaces, analog-to-digital converters and other components all assembled on one chip, which is one of the main advantages of microcontrollers. Depending on the software, the amount of outdoor units connected to it is very small.
- Microcontrollers are less efficient than microprocessors. They are used in a variety of systems for a variety of mission standards. However, since a microprocessor requires a large number of external components such as memory, serial networks, hard disk, and I / O ports, its power consumption is much higher than that of microcontrollers.
- Digital signal processing is mostly used in systems that have signal processing.

1.4 EMBEDDED SYSTEMS APPLICATIONS

1.4.1 APPLICATIONS FOR CUSTOMERS:

We use a variety of home embedded systems such as microwave ovens, remotecontrols, VCD players, DVD players, cameras, etc ...

Fig1.3:Automatic coffee makes equipment

The automatic coffee machine is described in Figure 1.3. Coffee machine, also known as coffee machine, tool used to make coffee. Even though there are many different styles of coffee makers that use different brewing principles, most common machines use a paper or metal filter inside a funnel located on a glass or ceramic coffee pot, which is a kettle-style cooking pot. Another room is filled with cold water, which is then boiled and added to the funnel. This is also known as drip fermentation.

1.4.2 OFFICE AUTOMATION:

We use fax machines, modems, printers and other similar devices.

Fig1.4:Fax machine

Fig1.5: Printing machine

The fax machine is shown in Figure 1.4. The number of data transmission solutions available to embedded device designers is at an exponential rate. One of the less costly alternatives to sending data is the use of ready-to-fax modem technology. Small, secure and inexpensive one-component Fax / DAA modem sets (less than 100.00.) Can be accessed from many sources and used to transfer text and graphics to the world's most popular printing system - Group Fax 3. The same machine for one- way data transfer The 9.6 and 14.4 kbps devices used are with some modifications.

The printing machine is described in Figure 1.5. Typography is a method of mass reproducing text and photographs using a master or blueprint. Cylinder seals and antiques such as the Cyrus cylinder and Nabonidus cylinders were one of the first paperless objects to use printing. Woodblock printing, which appeared for textileprinting in China before AD 220, was the first documented method of applied printing on paper. However, it was not translated for printing until the 7th century.

1.4.3 INDUSTRIAL AUTOMATION

Embedded devices are also used in various industries to manage operations. In industries, we develop embedded systems to perform specific work such as measuring temperature, pressure, humidity, voltage, current, etc., and then control other devices based on these regulated limits or send the data to a central monitoring station.

Fig1.6:Robot

We may use robotics that are designed to do a particular activity in sensitive industrieswhere human intervention is not allowed.

1.4.4 COMPUTER NETWORKING: Embedded modules are used as bridges, routers, and other similar devices.

TELECOMMUNICATIONS: Mobile phones, online cameras, and so forth.

Fig1.8:Cell Phone

Fig1.9:Web camera

The cell phone is shown in Figure 1.8. A mobile phone is an embedded device because it contains hardware and software dedicated to performing specific tasks, such as receiving user feedback by touch or buttons, searching and connecting to theInternet, and displaying information. In short, it is a device with specific peripherals and an operating system designed to be very useful using less resources.

Figure 1.9 depicts a webcam. The most common use of a webcam is to create video communications that allow computers to function as video phones or video conferencing stations. Popular applications for security surveillance, computer vision, video streaming and social photography.

CHAPTER-2

LITERATURE SURVEY

1. **Impact of crude oil revenues on economic development in Nigeria (1960- 2010).Nwoba, O.E. And Aba, E.O. IOSR J. Hum. Science Corporation, Vol. 22, no. 2, pp. 85-99, 2017.**

The history of Nigeria's oil industry dates back to the early twentieth century, when the British colonial government launched the first geographical survey of the region shortly after it was established as the country's legal entity. From 1956 until the first oil well sank in Oludeni, until mid-2013, when the price of production fell to a level that common sense could not understand, oil is still a staple to the Nigerian economy today. In Nigeria, policy design appears to be responding to the oil situation or trying to take advantage of it. It generally takes the form of "increasing costs as oil revenues rise, taking their place when profits are low and seeking desperate exits when profits fall" (Bioden 2004). Economic development has been a source of controversy in the academic and non-academic sectors since the beginning of time. Consequently, one method of calculating emerging industries is to measure the growth of key sector of the economy to determine their contribution to the overall national economy (s).

2. **Pipeline, coastal and road transport of petroleum products by automated network model. 2016, 6, at 151--165 Int. Optim J. Control theory. Application**

The need to assess the economic impact of Nigeria's oil revenues has become more complex. According to Alley, Asekomeh, Mobology and Adeniron (2014), Nigeria received $ 390 billion in oil-related economic revenues from 1971 to 2005. With a population of 173.6 million in 2014, Nigeria is the most populous country in Africa. Nigeria has the largest economy in Africa, with a GDP of $ 522.6 billion in 2013. (Www.populationaction.org). Nigeria is now the largest oil producer in Africa.

3. **Azav; Whatever.Adedocon. C. Noishi. MA Adegboy; C. Agago c. Colo surveillance system for oil pipeline theft and vandalism.Int J. Eng. Sciences.Apple, Vol. 2, no. 2, 2018, pp. 41-46.**

Pipeline destruction and theft continue to pose a major security threat to the government and citizens of the affected countries, as this deadly act usually causes significant damage. Economic collapse, loss of human life, toxic decline and extinction of marine species are some examples. The Internet-based Oil Pipeline Destructive Framework with ATmega328, GSM and GPS is built to provide remote knowledge control. The prototype was tested on a 10m pipeline with configuration limits

ranging from 28 to 210. The results obtained include the locations of the sensor nodes in the pipeline network, geographic coordinates (longitude and latitude) and time, which are sent to the base station as a warning SMS (BS). The system aims to detect the early detection of destruction of crude oil pipelines and direct security to the exact location of current theft activities.

4. Record Keeping and Human Evolution, s. Basu and G.B. Weimar.Horizon.2006, 20, 201--229.Counting.Horizon.2006, 20, 201--229.

Joint ventures give you immediate access to new markets, skills and technologies, as well as the opportunity to reduce costs and disseminate risk (Co. and Venkaterman, 1991). Since a joint venture is an important type of business agreement, it is very important to define consistent reporting guidelines. The goal of this analysis is to determine whether emerging markets and PCs are giving financial results of different importance to capital market investors. According to the conceptual framework, investors are the primary recipients of financial statements, and the reports are specifically designed to assist in estimating their value (IFRSF, 2010).

CHAPTER-3

PROPOSED METHOD

3.1 Block diagram of the proposed method

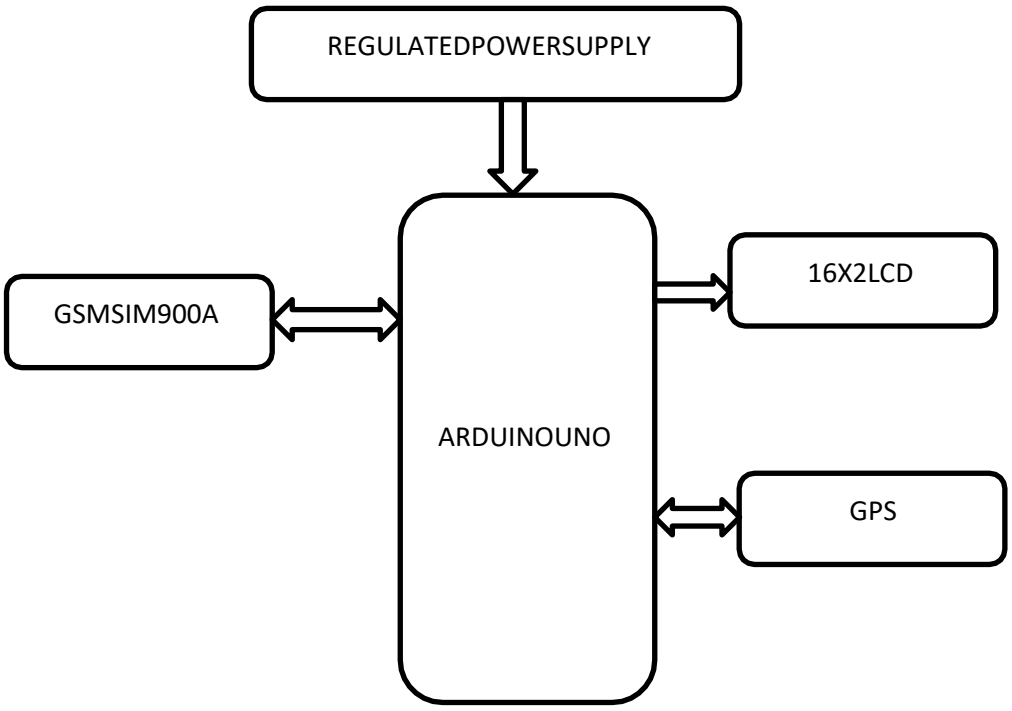


Fig 3.1: location tracking with GPS and GSM to send SMS

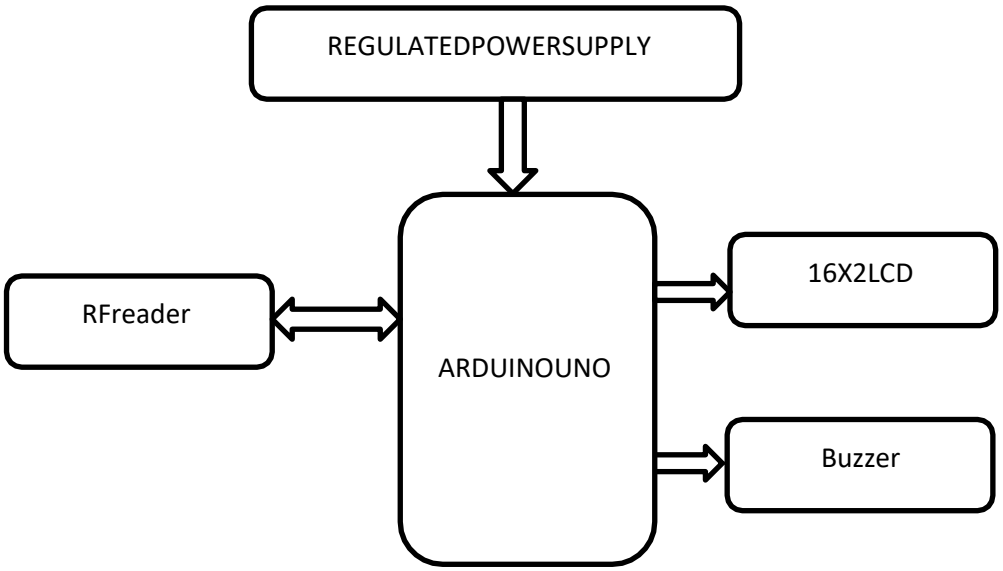


Fig 3.2: RFID to authenticate track data

Location monitoring using GPS and GSM for sending SMS as shown in Fig.3.1. Manufactures ARDUINO UNO board, controlled power supply, RF reader, LCD panel and buzzer block. Integrated circuit, a controlled power source that converts unrealistic alternating current (alternating current) into a constant DC current. It converts AC power into direct current with the help of rectifier. Its purpose is to provide a constant voltage (or often, current) to a circuit or system operating under certain power supply parameters. The performance of a controlled power supply may be alternate or unidirectional, but it is always constant power. Stability may be limited to ensure that performance remains within those limits under different loading conditions or may relieve fluctuations in its supply source.

A GSM modem, also known as a GSM module, is a hardware unit that connects to a remote network using GSM cellular phone technology. In the eyes of the mobile network they are similar to ordinary cell phones, although a SIM card is required to isolate oneself in the network. Typically, GSM modems provide TTL level serial interfaces to their hosts. Embedded Systems is the most popular app for them.

Liquid Crystal Display (LCD) is a flat screen display or other electronic modified optical unit that uses liquid crystals and polarizers to module light. Liquid crystals do not particularly emit light; However, they use a backlight or reflector to create color or monochrome photographs. LCD screens can display random images (as in a general-purpose computer screen) or can display or mask images with less informative material, such as current regulations, numbers, and seven-segment displays (as in a digital clock). They all use the same basic hardware, but random representations are created using a series of smaller pixels, while most displays use larger components. LCDs can be turned on (positive) or off (negative), depending on the setting of the polarizer. For example, a positive backlit LCD has black letters in the backlight color background and a negative character LCD has a black background with the same colored characters as the backlight. Optical filters are used to give a unique look to white and blue LCD screens.

Global Positioning System, is also called as Navstar GPS, which is satellite-based radio navigation system owned and operated by the United States Space Force. It is one of the world's satellite navigation systems. GNSS systems that provide geolocation and time details for a GPS receiver anywhere on or near the ground where four or more Global Positioning System (GPS) satellites can be viewed without interruption. Relatively small GPS signals can interfere with mountains and buildings.

The RFID ID for root data authentication is shown in Figure 3.2. RFID (Radio Frequency Identification) is a technology that uses electromagnetic fields to identify and identify tags attached to elements. Radio transmitter and receiver, radio receiver and transmitter make RFID device. The tag transmits digital data, usually a recognizable inventory number, to the reader when prompted to do so by an electromagnetic probe pulse from a nearby RFID reader unit. This number is used to track the list. A buzzer also known as a whistle, is an acoustic signaling system that can be of electronic, electromechanical or piezoelectric nature (abbreviated piezo). Alarm clocks, timers and verifying user feedback such as mouse click or keystroke areall common uses of alarms and beeps.

3.3 GSM (Global System for Mobile Communications)

3.3.1 Module

GSM modems, including cellular telephones, are specialized models of modems that work through subscription-based cellular networks. The GSM modem embeds the subscriber identification module (SIM) card and acts as the computer's cell phone. A dedicated cell phone with a GSM capability can also be used as a modem.

Conventional modems are used to connect computers to other computers via dial-up connections. A GSM modem works in a similar way, using radio waves to transmit and receive data, instead of using a telephone line. This type of modem can be an external interface connected to a computer using a USB cable or serial cable, However, it is mostly a portable unit that plugs directly into the monitor, USB port or card slot in a laptop.

It is the most popular mobile networking device in the world. GSM is a free digital cellular system that uses frequency bands of 850MHz, 900MHz, 1800MHz and 1900MHz to transmit mobile voice and data services.

3.3.2 FEATURES

- The quality of the frequency spectrum has improved.
- Compliance with International Roaming IS ISDN (Integrated Services WirelessNetwork). Emerg supports emerging servicesSim Phone Book Management • Fixed Dialing Number (FDN) lar Real time clockwith alarm control.

3.3.3 GSM MODEM:

The GSM modem is a form of wireless modem that connects to the GSM network. The cellular modem works in much the same way as a dial up modem. The major disparity is that the dial up modem transmits and receives data via a fixed telephone cable, while the cellular modem transmits & receives data via electromagnetic waves.

The GSM modem can be a PC card / PCMCIA card or an external computer. An external GSM modem is usually related to a device with a serial cable or USB cable. PC card / PCMCIA card is a GSM modem intended for use with a laptop computer. It can be loaded into a notebook PC / PCMCIA card slot. A GSM modem, such as a GSM cell, allows you to operate a SIM card from a wireless provider.

Computers monitor modems with AT commands as discussed in the previous sections of this SMS tutorial. The universal range of basic AT commands supports GSM and Dialup modems. The GSM modem should be used in the same way as the dial-up modem.

GSM modems accept extended AT commands in addition to regular AT comm. ands. GSM standards describe the AT commands that apply. You can use extended AT commands to perform tasks such as:

- Read messages can be read, written and deleted.
- Send Text Text Messages (SMS).
- Signal Monitor signal strength.
- Battery Keep track of battery charge status and charging speed.
- Phone Scan, read and author phone book entries
- The amount of SMS messages that a GSM modem can process per minute is verylimited and ranges from six to ten per minute.

3.3.4 APPLICATION FOR GSM MODEM

Allows instructions instead of GSM network requests. The GSM specification is very detailed about the features and interface parameters, but does not include the hardware.

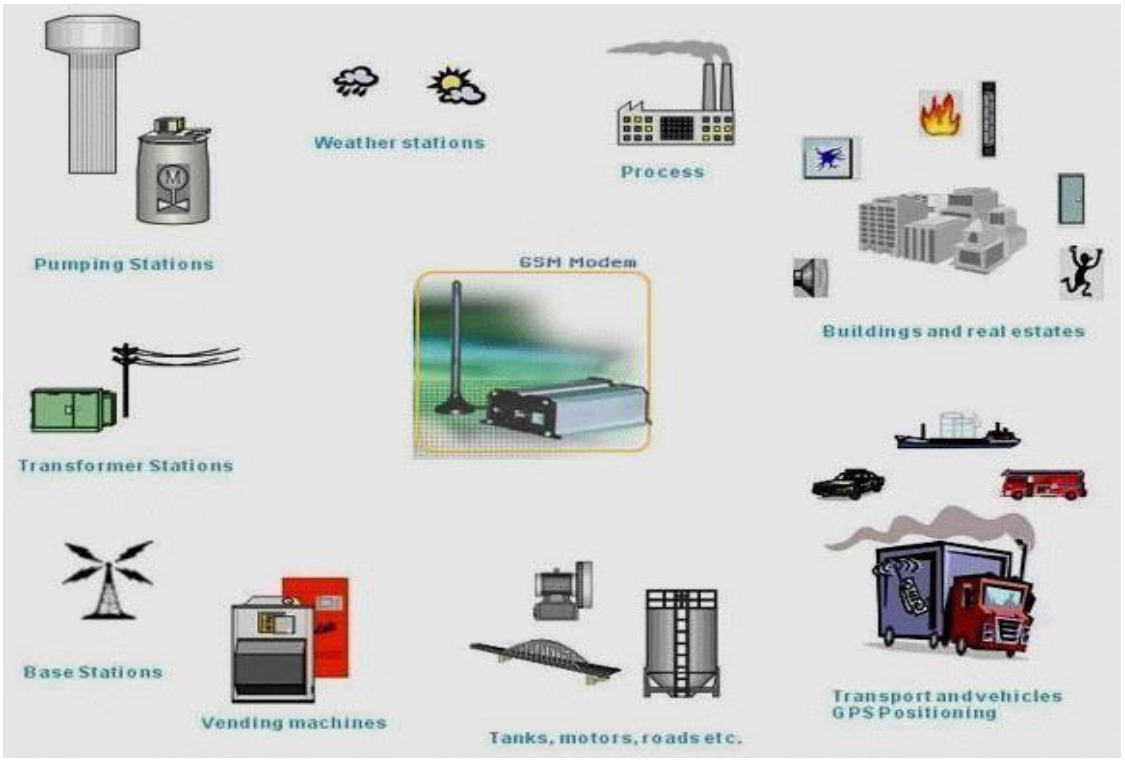


Fig3.3.4: GSM Network

The explanation is to limit designers as much as possible while allowingoperators to purchase equipment from a variety of suppliers. The Switch System (SS), Base Station System (BSS), and Service and Maintenance System (OSS) make up the GSM (OSS) network.

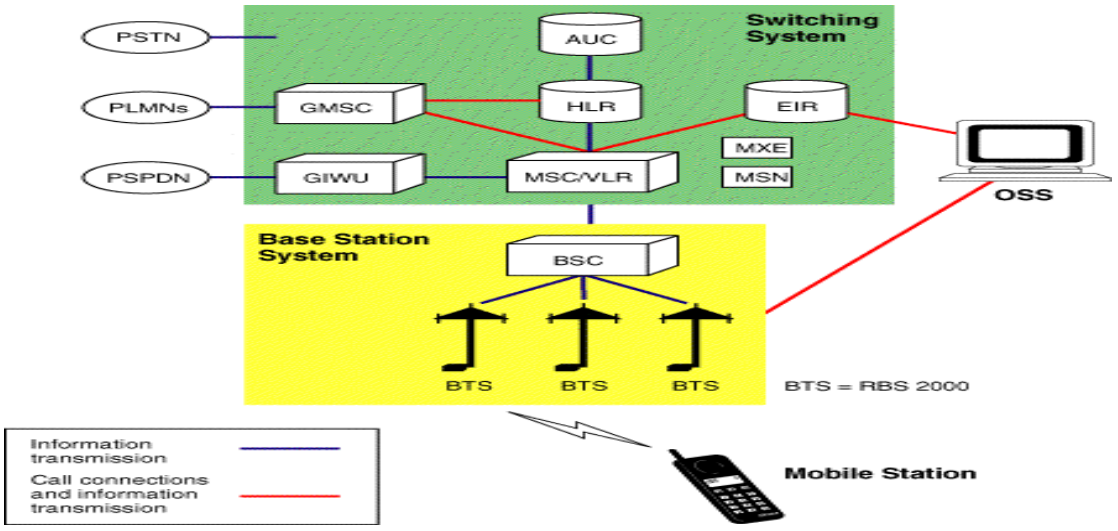


Fig3.3.5: Block diagram of GSM system

3.4 GPS (GLOBAL POSITIONIG SYSTEM)

3.4.1 Introduction

The Global Positioning System (GPS) is a satellite-based navigation system that can be used to locate a person anywhere on the planet. It includes satellites, control and display centers and receivers, and is designed and controlled by the UnitedStates Department of Defense. GPS receivers use a triangle to determine a user's exact location using details transmitted by satellites. During the event, GPS is used in many forms.

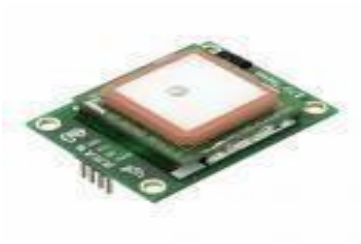


Fig3.4.1: GPS

The GPS system consists of three components: 24 to 32 satellites in Earthorbit, four control and tracking stations on Earth, and user-owned GPS receivers. GPS satellites send signals from a location used by GPS receivers to calculate 3D position (latitude, longitude and altitude) and time.

- Determine the locations of places. For example, you would need to send your location details by radio to a helicopter pilot to be picked up by the pilot.
- Moving from one place to another from Esc escorts to fire environments.
- Digital To create digital maps. For example, you are in the process of planning fire and hotspot environments.
- Points To calculate the distance between two points or the distance between you and another place.

3.4.2 WORK IN PROGRESS

- The Global Positioning System (GPS) is a group of satellite that orbit the Earth in a continuous orbit. These satellites, which have atomic clocks, transmit radio signals containing their exact location, time, and other data. The GPS receiver

receives radio signals from satellites that are tracked and corrected by control stations. It only requires three GPS receiver satellites to map approximately 2D location, which is not very accurate. For more accurate 3D location plotting, four ormore satellites are required.

- The Global Positioning System (GPS) consists of three components.
- Room, power and consumer are the three components of the Global Positioning System (GPS).
- Satellites orbiting the planet are called space units.
- The space division has 29 satellites that orbit the planet at an altitude of 12,000 miles every 12 hours. The signals occupy a large area as they are at a higher altitude.

At any given time, a GPS receiver on Earth sends a signal from at least four satellites due to the way they are placed in their orbits. Each satellites has several atomic clocks. Satellites send low-power radio signals with special code at different wavelengths that can be detected by a GPS receiver. The primary purpose of these encoded signals is to enable the GPS receiver to measure the transit time of the signal from satellite time to the reciver. The time interval between the satelliteand the GPS receiver is equal to the transport time combined with the speed of light. Control and tracking stations are part of the control component.

The satellites are tracked by the control department, which then provides them with corrected orbital and temporal data. It has five unmanned demonstration centers and a master control station controls the area. Five unmanned stations detect GPS satellite signals and send the data to the main control station, which corrects any errors before sending the data back to the GPS satellites via ground antennas.

- Citizens' and military-run GPS receivers have a consumer section.
- Users and their GPS receivers have a user section. There are no restrictions on the number of people who can log in at one time.

CHARACTERISTICS OF GPS RECEIVERS FROM NAVIGATIONFEATURES

- 500 path / symbol points, name and glyph each, 10 close (automatic) and ten proximity.
- Roads to take:20 manual point-to-point routes up to 50 points each; Automated methods turn-by-turn.
- Tracks: Automatic track record; Save up to 10 tracks to track your steps in two steps.
- Trip Planning Computer: Timers, simple and limited speed and adjustable odometer
- Anchor lane points, approach and entry, lane exit and proximity alarms. Schedules: Built-in astronomical tables for optimal hunting and hunting hours, as well assunrise / sunset and moon times depending on date and location.

Recipient: A 12-channel parallel GPS receiver that supports WAAS constantly monitors and updates your location using 12 satellites.

Acquisition time:

- Warm: about 15 seconds Cold: about 45 seconds
- The AutoLock program takes about 5 minutes.
- Update volume 1 / sec, continuous GPS accuracy.
- Location: Approximately 15 m, 95% typical *
- Constant speed of 0.05 0.05m / s
- WAAS Accuracy:
- Center: 3 meters, 95% of the time
- Constant speed of 0.05 0.05m / s
- 6 gram dynamics
- Detachable Garmin antenna patented with NMEA 0183 RS232, RTCM 104 DGPS

Data format, and modular BNC socket.

- RTCM-104, WAAS, RTCM-104, RTCM-104, RTCM-104, RTCM-
- Dimensions: 5.0”x2.3 " high x 1.6 " depth (12.7x5.9x4.1cm)
- Weight (with batteries): 9 ounces (255 g)
- Screen: 256 x 160 pixels, high-contrast FSTN with bright backlight, 2.2 inches x 1.5 inches high (5.6 x 3.8 cm). The direction can be changed.
- Waterproof, high-impact plastic-alloy case covered completely with rubber band according to IEC 529 IPX7
- Temperature range: 5 F to 158 F (-15 C to 70 C). Data management for users: No memory battery required as it is indefinite. 8-335V DC, 4 “AA” batteries as power source.

THE REVOLUTION OF COMPUTERS.

Google Earth is the most popular technology that uses signals received by GPS receivers. It allows the general public to view maps that inform customers of various topics.

Many destinations around the planet use the Global Positioning System for a variety of purposes. According to a journal study, the number of people who use each criterion is as follows.

- 37% of people use GPS in their cars.
- 26 percent of the time, the arm is kept.
- Track 10%
- GIS has an 8% market share.

Unit with 3.5 inch LCD screen

The LCD unit is used to display dynamic messages. We see a two-line, 16- character smart LCD screen attached to consoles. The handshake procedure is as follows. Data lines D0 to D7 bit, control pins RS, RW, EN, remaining pins + 5V, -5V

and GND. RS means register select, RW read right, EN enabled.

The display has two internal byte-level records, one for commands (RS = 0) and the other for displayed characters (RS = 1). It has a user programmable RAM (character random access memory) field that can be used to create any character that can be created with the dot matrix. The command hex bytes 80 is used to separate these two data areas, indicating that the screen RAM address 00H is used. Commandor data sorting is provided by port 1 and record pick and read / write levels are provided from port 3.2 to 3.4.

Different time is required to complete the tasks mentioned on the screen. To prevent the display from being overwritten, the LCD 7 bit is scanned for high (busy) logic.

LCD stands for Liquid Crystal Display, used to provide user experience and for debugging. The Hitachi 44780 is the most popular LCD controller, providing a clear interface between the controller and the LCD screen. These LCD monitors are not only easy to use with a remote control, they are often inexpensive.

Fig 3.5.1: 2x16 Line Alphanumeric LCD Display

1 x 16 (one line and 16 characters), 2 x 16 (double lines and 16 characters per line), and 4 x 20 (double lines and 20 characters per line) (four lines and twenty characters) per line).

An LCD screen requires three control lines (RS, R/W, and En) plus eight (or four) data lines. Depending on the service method, the amount of data lines may vary. If you choose to use 8 bits, you will need 8 data lines and 3 control lines for a total of 11 lines. When operating in 4-bit mode, 7 lines are required: 4 data lines + 3 control lines. What criteria do we use to select the mode to use? It's very simple; if you have enough data lines, you should use 8-bit mode. If you have time constraints such as the need for fast rendering, you should use 8-bit mode as 4-bit mode takes twice as long as8-bit mode.

Pin	Symbol	Function
1	Vss	Ground
2	Vdd	Supply Voltage
3	V0	Contrast Setting
4	RS	Register Select
5	R/W	Read/Write Select
6	En	Chip Enable Signal
7-14	DB0-DB7	Data Lines
15	A/Vee	Gnd for the Backlight
16	K	Vcc for Backlight

Table 3.2: Pin Description

Data is shown as a command when the RS is low (0). When RS is set to high (1), the transmitted data is described as text data displayed on the phone.

When the R / W is low the knowledge in the data bus is written to the LCD (0).If the RW is large (1) the software can read effectively from the LCD screen. Since reading from an LCD is rarely required, this line can be connected directly to the Gnd, which provides a single control line.

When the RS is small, the data appears as a command (0). When RS is set to high (1) the sent data is referred to as text data displayed on the phone.

When R / W is small, database information is written to the LCD (0). If theRW is high the software reads effectively from the LCD (1). Since reading from an LCD is rarely required, this line may be directly connected to the Gnd, resulting in a single control line.

The zip code is used to unlock the data pins. High-low signal is required for record keeping. The LCD describes our commands and executes them when the EN line is pressed.

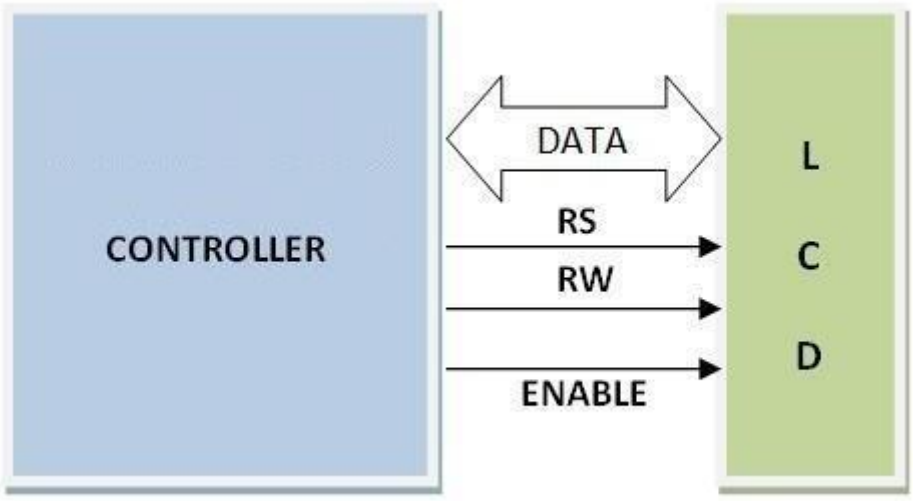


Fig 3.5.2: Interfacing with microcontroller

3.6 RFID

HISTORYOF RFID

San Jose Mercury News has a great story about Charles Walton who invented RFID technology. Walton, now 83, earned more than $ 3 million from his first patent in 1973. Unfortunately, the most recent RFID patent expired in the mid-1990s. As a result, it will not benefit from the billions of RFID tags that will appear in the coming years. But he continues to innovate and the most recent patent for a zip code proximitycard was granted in June 2004.

What is RFID?

Radio frequency identification, or RFID is a technology that uses radio waves to detect objects. In most cases, the RFID device consists of two parts. One or two transceivers, also known as tags, barcode reader tags gave way to RFID systems as a way to instantly identify and monitor objects and individuals. RFID devices are popular with you if you use the following:

- Access control
- RFID readers are installed at the entrances, allowing a person to move their proximity card (RF tag) "read" before gaining entry.
- Payment systems with fewer connections

- Payment details are carried on RFID labels. RFID tags are ideal for automated toll collection systems. Payment information is sent to a fixed reader connectedto the toll station via private cards attached to the car or held by individuals. Payments will be removed from the user account regularly or the details will be explicitly updated in the RFID tag.
- Management Inventory management and product tracking
- RFID devices are often used to monitor and document the movements of everyday objects such as library books, clothing, storage platforms, electronic products and many other products.

RFID is in action

The standard RFID scheme is described below. Transceiver tags on any RFID device contain data. This information can be as simple as a single binary bit or as complex as a large number of bits containing identification code, personal medical information, or almost all other types of binary digital data.

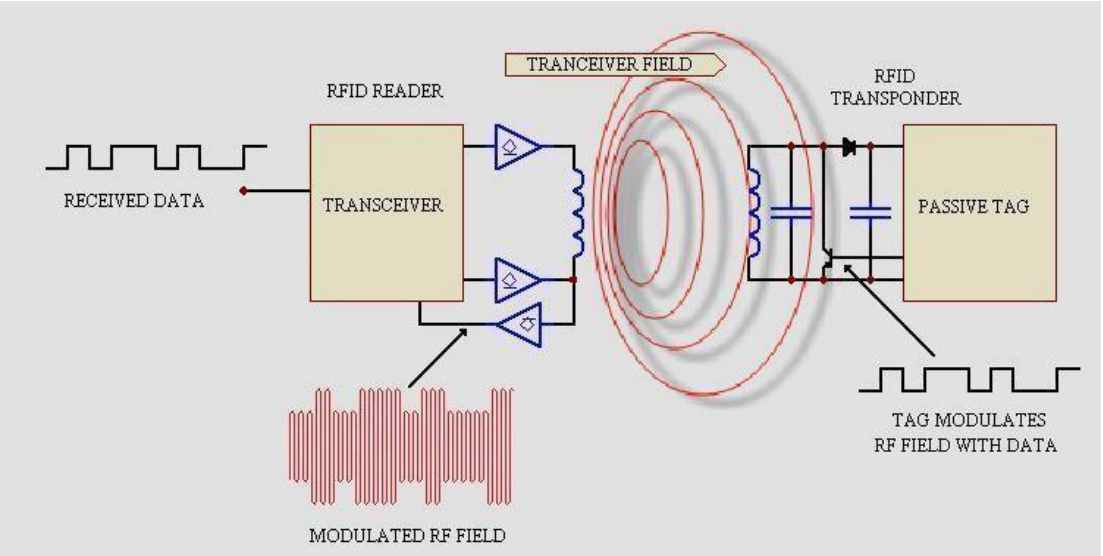


Fig3.6.1: Working operation

See Figure 3.6.1 RFID transmitter and receiver connected to the passive tag. Negative signals do not have their own energy sources and rely on the event's electromagnetic field for energy. Usually there is a nice chip at the heart of each symbol. When the RF area created by the tag is reached, it can gain enough power to access its external memory and transfer the data it stores.

When the transceiver symbol attracts power in this way, the radio frequency fields overlap, causing a voltage drop across the transmitter and receiver antenna. The symbol uses this effect to convey its knowledge to the reader. The tag adjusts the absorbed voltage across the transmitter and receivers according to the bit pattern you want to transmit by controlling the total power taken from the ground.

RFID Efficiency

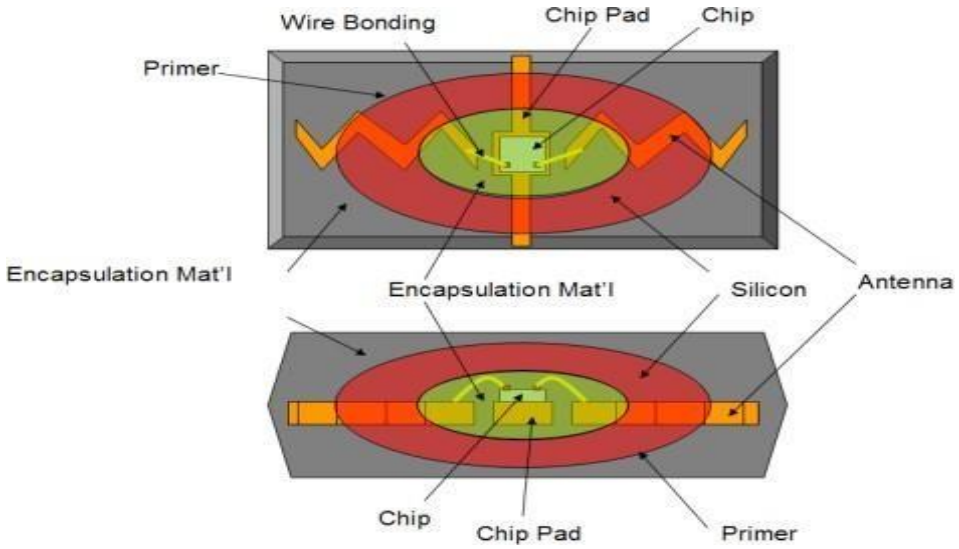
Here are three components of a basic RFID system:

Antenna or coil transmitter and receiver (including set-top box) Electronically produced specialized transponder (RF tag) and some of them:

Antenna 1:

To operate the signal and read and write data to it, the antenna sends radio signals. The antennas attach the tag to the transmitter and receiver, which handles the device's data collection and communication. Antennas can be installed in a door frame to collect signal data from passing people or objects or placed in a toll booth on the highway to track vehicles passing through the highway. When several markers are required on a daily basis, the electromagnetic field emitted by the antenna may be present at all times. The sensor opens the system field if continuous inquiry is not required.

The antenna often combines with a transceiver and set-top box to form a reader(also known as a detector) that can be used as a portable or fixed-mount unit. Depending on the power source and the frequency of the radio frequency used, the reader can receive radio waves in the range of 1 inch to 100 feet or more. The RFID tag senses the reader's activation signal as it travels through the electromagnetic field. The data encoded in the marker's integrated circuit (silicon chip) is decoded by the reader and sent to the host device for processing.



1. TAGS (Transponders)

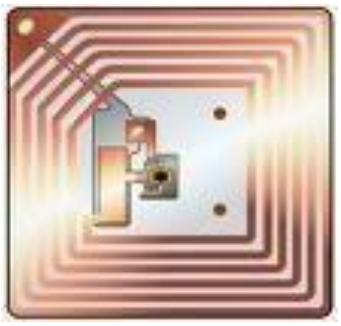
The RFID tag contains a small chip with detailed identification and an antenna that transmits this data wirelessly to the reader. The chip, at its basic level, has a sequential identifier, such as a license plate number, that uniquely identifies the object.

Similar to the number of barcodes in use today, RFIDs have a greater storage capacity than their barcode counterparts. Manufacturer, batch or batch number, weight, ownership, destination and background Types of details encoded on the result mark (such as the temperature range at which the item is exposed). In fact, depending on the software, RFID tags can store endless other types of data. For labeling purposes, RFID tags can be affixed on personal products, boxes or pallets as well ason fixed assets such as trucks, boxes and handbags.

Tags are used in a variety of ways and capabilities. The following are important variables: "read-only" and "read-write": As for how data is encoded in tags, there are three options:

(1) Read-only tags contain pre-written details on the tag by the manufacturer or trader, such as a sequential tracking number. These codes are usually cheaper because they cannot provide additional details as they go through the product chain. Some changes in the data need to be updated in the framework software that monitors SKU movement and operation. (2) In development or delivery systems, the "write once" tags allow the user to write data only once per tag.

(3) Complete "read and write" tags allow new data to be added to the tag if necessary - and even to overwrite existing data. The duration and date of the holdover, for example, or the management history of the fixed asset are examples of the following capabilities. Although it is the most expensive of the three marking models and is not suitable for low-cost product monitoring, the Electronic Potential Product Code (EPC) guidelines move in this direction.



RFID TAGS

DATA CAPACITY

The amount of data that can be stored in a tag varies, ranging from 16 bits atthe low end to thousands of bits at the high end. Obviously, the more storage space, the greater the amount of each card.

The type factor tag and antenna system can be independent or integrated as partof a standard tagging arrangement (for example, the tag is included in what appears to be a simple barcode label - referred to as a "smart label"). Organizations should deliberately select the form factors of the mark and plan that they should use a number of from factors to meet the labeling requirements of various physical products and unit of measurement. For example, a pallet may have an RFID tag attached to asecure area on the pallet. On the one hand, RFID tags embedded in barcode labels in pallet boxes provide operators with a backup copy along with human-readable details when the tag fails or is sent via RFID-enabled supply chain communications.

Active v/s Passive:

No battery is included in the "passive" identifier, which "transmits" its data only when the reader is activated. They need to be actively surveyed to display the data. "Active" tags can transmit their information using only their battery power. Overall, this indicates that active tags have a longer reading range than passive marks -

possibly 100 feet for active codes or 15 feet for passive marks or less. However, the increased efficiency of active tags and reading ranges has a price: they are many times more expensive than passive tags. Active tags are now mostly used for fixed assets such as expensive goods or trailers, where the cost is lower compared to the value of the item and much larger reading ranges are available. Less expensive negative tags can be used in most traditional supply chain applications, such as RFID-based monitoring and implementation systems developed in the FMCG retail chain.

Systems

RFID tags can communicate with readers using a combination of frequencies or spectra, just like any other wireless connection. Again there are trade-offs between costs, capacity and implementation specification. Low frequency frequency markers, for example, are less expensive than UHF markers, require less strength and penetrate non-metallic materials faster. It is ideal for wiping objects with a lot of water, such as berries, at close range. UHF frequencies have more spectrum and can transfer data more quickly. However, they use more power and cannot travel through these vehicles. UHF labels are often found for wood, paper, cardboard or textiles. UHF signals are ideal for clearing cargo bins when going to the warehouse through a large door rather than low frequency frequency signals. Although execution commands have unique markup features, a set of tag styles may be required to address specific organizational issues. To properly identify the best combination of RFID technologies for your setup and applications, you would like to partner with a company that is well versed in tag technology and reader.

EPC codes

EPC stands for Electronic Product Code, and is a growing standard for RFID tags, readers, and marketplace software created at MIT's Automatic Identification Center. The company has been instrumental in the development and use of RFID technologies. EPC is an object recognition method with an advanced markup format that incorporates the tag's data quality and wireless access protocols. In some ways, EPC traffic connects data requirements expressed in barcode specifications, such as UPC or UCC-128 barcode standards, established by ANSI and other organizations with wireless data transmission standards.

2 . RF Transceiver: An RF power source used to initiate and control negative RFID tags. The RF receiver can be integrated into the reader cabinet or it can be

separate device. The transceiver is usually called the RF module when it is distributed as a separate device.

The radio frequency encies transmitted and received by the antenna are controlled and modulated by the transmitter and receiver. The bounce scatter signal from the negative RFID tag is filtered and amplified by the transmitter and receiver.

Typical Applications for RFID

Inventory Management operation Operation during operation • Container / Yard Management • Tracking Documents / Jewelry • Patient Supervision

Advantages of RFID over bar coding

1. No "line of sight" requirements: Since the scanner and barcode can provide a straightforward "line of sight", barcode readings can be limited or annoying. RFID tags can be understood by things that are invisible to the naked eye.
2. More machine reading: RFID tags can be understood instantly when the tagged product scanner is crossed or approached, saving time and leading to more active real-time monitoring.
3. Good read rates: RFID tags take longer read rates than barcodes, especially in high- speed operations such as cardboard sorting.
4. “Write” capabilities: RFID tags can be rewritten with new details while performing supply chain operations, so tagged items bring up-to-date knowledge as they pass through the supply chain.

RFID problems in people

Reader collision and tag collision are two common problems with RFID. If the codes are ideals from two or more readers, this is called reader collision. Sign was unable to respond to multiple inquiries at the same time. To avoid this problem, systems must be carefully prepared. When there are multiple signals in a confined space, tag collision occurs; However, since the reading time is very short, it is easy for sellers to create mechanisms so that the tags can interact one by one. For more details, see RFID Issues.

3.7 Buzzer

A buzzer or whistle is a mechanical, electromechanical or computer approach to an audio signal. Verification of user feedback such as alarms, clocks and mouse clicking or pressing a switch is the normal implementation of all alarms and beeps.

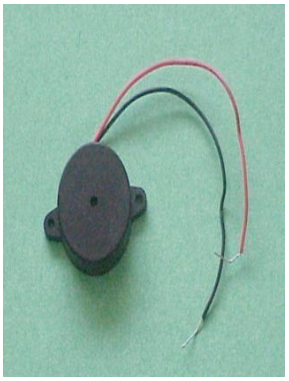


Fig:2.16Buzzer

FEATURES

Unlike Electromagnetic Buzzers, the PB series is a high-performance whistle with a single-shaped ceramic component and a self-activated oscillator circuit that consumes very little power. The long contacts are made without changing and without electrical noise, which is small enough to fit in your pocket but also produces high quality sound with low voltage.

Mechanical

A fully mechanical hour is a pleasure hour, for example.

Electromechanical and mechanical

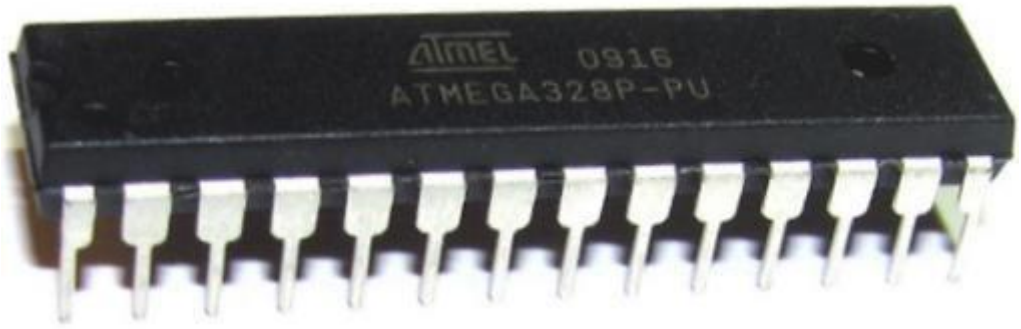
The first tools used the same electromechanical mechanism as the electric bell, except without the metal bell. The relay, for example, may be wired to shut off its drive current, which allows contact to ring. These units are often attached to a wall of ceiling and serve as a sound panel. The coarse sound of electromechanical whistles ledto the word “bell".

CHAPTER-4

PIN CONFIGURATION OF ATMEGA328P ARDUINOUNO

The Arduino Uno is the most popular Arduino model. When most people refer to Arduino, they refer to this board. Arduino Uno is a great choice for beginners and one of the most popular boards in the Arduino family. There are several updates for the Arduino Uno; A recent revision is described below (Rev3 or R3). Arduino Uno ATmega328 based microcontroller. It has 14 optical I / O pins (six of which can be used as PWM output), six analog inputs, 16 MHz ceramic resonator, USB connection, power port, ICSP header and reset button on board. It comes with everything you need to start with a microcontroller; Connect it to a device with a USB cable or power it with a DC adapter or battery.

Microcontroller	:	ATmega328
Operating Voltage	:	5V
Input Voltage (recommended)	:	7-12V
Input Voltage 0(limits)	:	6-20V
Digital I/O Pins	:	14 (of which 6 provide PWM output)
Analog Input Pins	:	6
DC Current per I/O Pin	:	40 mA
DC Current for 3.3V Pin	:	50 mA
Flash Memory	:	32 KB (ATmega328) of which 0.5 KB
used by bootloader		
SRAM	:	2 KB (ATmega328)
EEPROM	:	1 KB (ATmega328)
Clock Speed	:	16 MHz
Length	:	68.6 mm
Width	:	53.4 mm



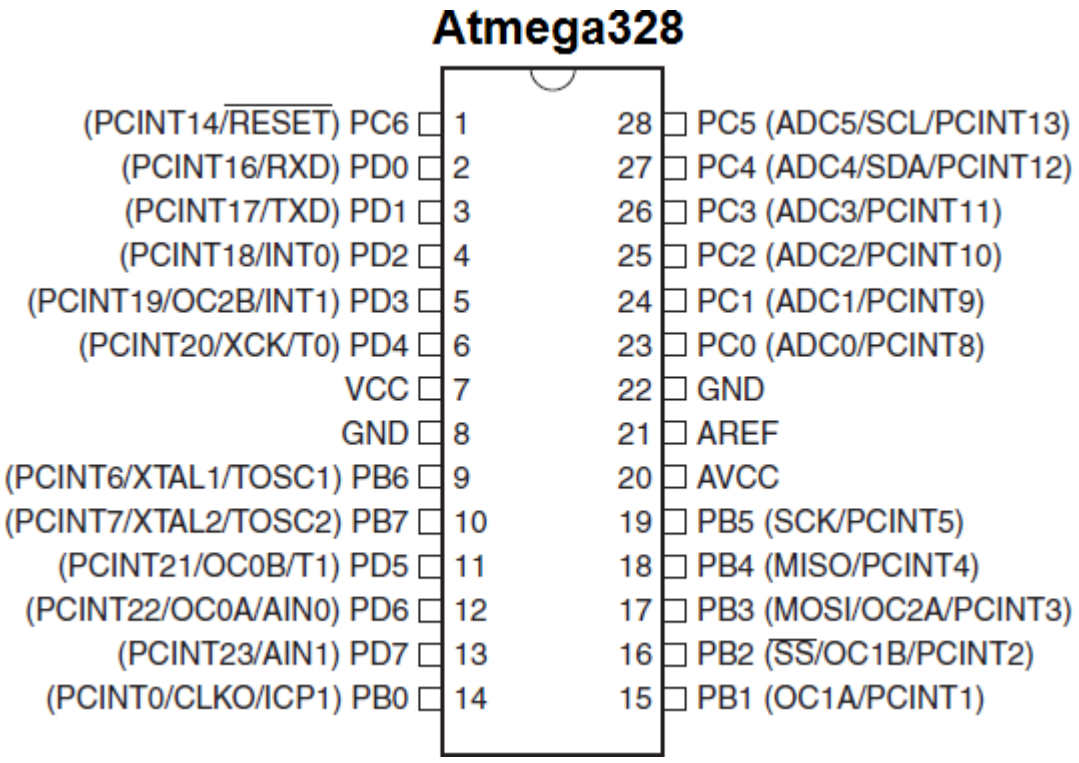
The Atmega328 chip pin is discussed in this report.

Atmel's Atmega 328 microcontroller is a widely used microcontroller chip. It is an 8-bit microcontroller with 32 KB of flash memory, 1 KB of EEPROM and 2 KB of internal SRAM memory.

One of the microcontrollers used in the iconic Arduino Dumilanov boards is the Atmega 328. Atmega168 or Atmega328 microcontroller chips are available on the Arduino Duemilanove board. The most sophisticated and improved of the Atmega328 chips. The Atmega328 has 32 KB of flash program memory and 2 KB of internal SRAM, compared to the Atmega168 16 KB of program flash memory and 512bytes of internal SRAM.

The Atmega328 has 28 pins. It has 14 optical I / O pins, including six PWM output pins and six analog input pins. Twenty pins are used for I / O.

The pin out for the Atmega328 is shown below.



Each pins are described in the table below with their purpose

As mentioned earlier, 20 pins serve as I / O ports. This ensures that it acts as aninlet and outlet for the circuit. Determines whether the device is input or output. The pins are 14 digital, 6 of which are capable of delivering PWM output. Analog input / output is supported by six pins.

The crystal oscillator is connected to two rods. This is to give a clock pulse to the Atmega chip. Synchronization requires a clock pulse, so the connection between the Atmega chip and the computer connected to it occurs in real time.

Save both pins Vcc and GND as power is required to run the chip. Since the Atmega328 is a low power processor, it only needs 1.8-5.5V power to run.

Analog-to-digital converter (ADC) integrated into the Atmega328 chip. If not, Atmega328 cannot decode analog signals. The chip reads analog notes because it has ADC, so it has 6 analog input pins. Three pins are reserved for running the ADC.

AVCC, AREF and GND are acronyms for AVCC, AREF and GND. AVCC isa positive voltage power source for ADC. In order to function, the ADC needs its own power supply. Ground power source GND. AREF is the reference voltage used by the ADC to convert an analog signal to a digital value. Analogous voltages greater than or equal to the reference voltage are assigned a numeric value of 1, whereas the numerical value of the analog voltages is assigned less than or equal to the reference voltage. Since ADC Atmega328 is a 10-bit ADC, it converts the analog signal into a digital one, the AREF value serves as a surrogate for whether the digital signal is high or weak. As a result, this digital value serves as an image for the analog signal; It is also the value of its optical counter.

CHAPTER-5

SOFTWARE

5.1 Software introduction:

The Arduino IDE is part of the program that allows you to program your Arduino, from the download tab of the official Arduinowebsite, you can download a variety of Arduino IDEs. You must use the appropriate program for your operating system (Windows, iOS or Linux). Unzip the file until the download is complete.

5.1.1: Definition of Arduino IDE

Arduino IDE is a free and open source program for writing and compiling Arduino module code. It is the official Arduino software, which is very easy tocompile the code and even those who do not have the technology can get used to it.

It runs on Java platform and is compatible with operating systems such as MAC, Windows and Linux. It has built-in functions and commands that can be used for debugging, writing and compiling in the environment. Arduino Uno, Arduo Mega, Arduo Leonardo, Arduo Micro and many other Arduo units are available.

On board they both configured the microcontroller and identified the data in code form. The key code, also known as the graphic created on the IDE platform, will eventually generate a hex file, which will be ported and sent to the board controller. The IDE environment consists of two parts: the editor and the compiler. The editor is used to write the required code, while the compiler is used to compile the code and upload it to the Arduino module.

5.1.2. ABOUT IDE

The IDE ecosystem is divided into three distinct sections:

A. Menu bar

B. Text editor

C. Output component

A) Menu Bar: The top bar is called the menu bar and it has five different options, asshown below.

File - You can create a new window or open an existing one to write code.

At the end of the assembly it will show you the hex file it created for the final sketchto be sent to the Arduino board for the specific task you want to accomplish.

Edit - Used to copy and paste code and make changes to the font.

5.1.3 Sketch is a tool that allows you to compile and program.

Tools - Mostly used in search programs. The programmer component of this board isused to copy the boot loader to the new microcontroller.

Support - If you are not sure about the apps, there is a lot of help online from gettingstarted to troubleshooting.

5.1.4 Libraries:

Libraries help provide additional features to the Arduino module. By going to add a library and clicking on the sketch button in the menu bar, you have a selection oflibraries.

When you select Add Library and insert the appropriate library, the #include icon will appear at the top of the graphic. If I use the EEPROM library, DHT11 / 22 temperature sensors, LCD or I2C library in a text editor.

5.1.5: Making Pins Input or Output

Digital read and digital write commands are used to convert Arduino pins to inputs and outputs, respectively. These commands are text-responsive, which means you must type them as they appear

Start with the lowercase letter "d" and end with the capital "W" as you type. Digital Writing or Digital Writing does not call or answer any functions when writing.

Select the Arduino board

- To download the diagram, we must first select the appropriate board and port forthis operating system.
- We go to the "Board" section and select the board we want to work with. Similarly,serial and USB boards are assigned to COM1, COM2, COM4, COM5, COM7 and

higher. The USB serial interface can be found in the Windows Device Manager ports folder.

- The COM4 port we used for my device is shown by the Arduino Uno with the COM4 port in the lower-right corner of the board.
- And when both the board and the serial port are properly selected, verify in the upper left corner of the six-button section and then click the Upload button or go to the Drawing section to verify / assemble and then upload.
- The drawing is created in a text editor and stored as a file with the extension.
  (ino) Note that new Arduino modules can be reset immediately after the IDEsoftware has been compiled and loaded; Older versions, however, may require a physical reset on the device.
- The TX and RX LEDs flash on the board as the load code loads, indicating that the requested program is running successfully.
- Serial Monitor is a program that allows you to find out what's going on with your computer
- Boot loader is a program that allows you to start playing a file
- We can find the boot loader at the end of the Tools section. It is very convenient to burn the code directly through the console as this eliminates the need to purchase anadditional burner.

CHAPTER – 6

RESULTS

6.1 Hardware Implementation

The result of this project can be checked in two ways which are hardware and software part to check the errors. The hardware part of the project consists of two parts. The first part is tracking and the second part is locating.

Tracking:

Tracking is the first part of the hardware implementation. The tracking part resides 16X2 LCD screen, Aruinouno board, RFID scanner, RFID authorized and unauthorized card, Buzzer and authorized key.

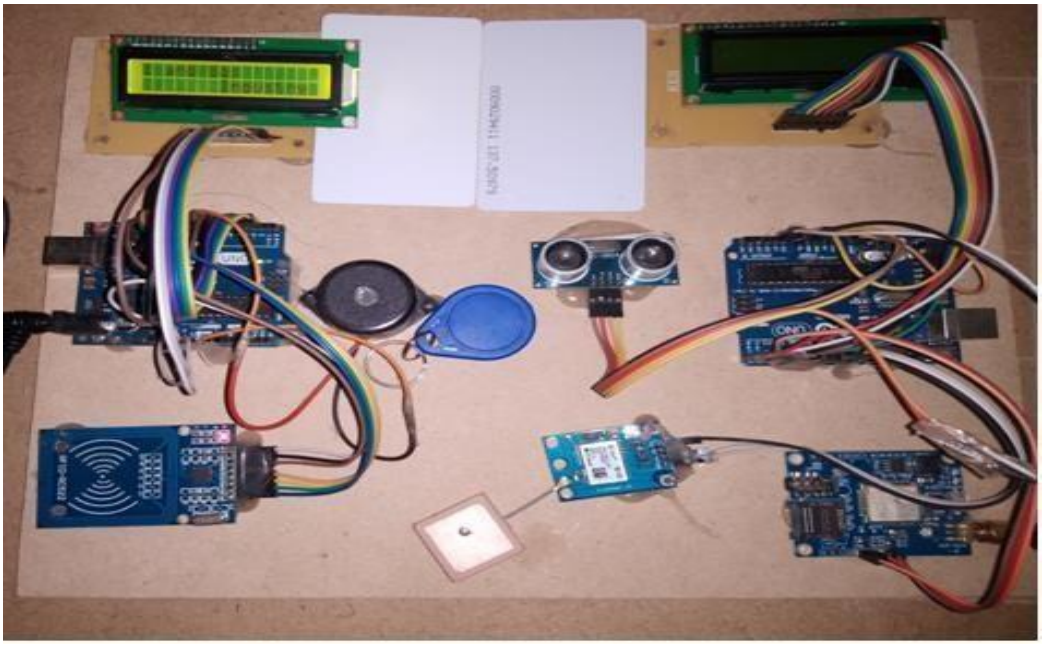


Fig6.1.1: Initial step of hardware Implementation

Figure 6.1.1 illustrates the first step of hardware implementation. To get started, an Arduino is widely used to connect the LCD panel, RFID scanner and buzzer. Arduino Uno Board is a low cost open source electronics platform with simple hardware and software. Arduino boards can understand inputs from sensors and convert them into output. Since we first plugged the connector into the outlet, the LCD panel displays I and the gas industry, i.e. the oil and gas industry. Initially the condition the truck will be steady position hence the screen shows as shown in fig 6.1.1.

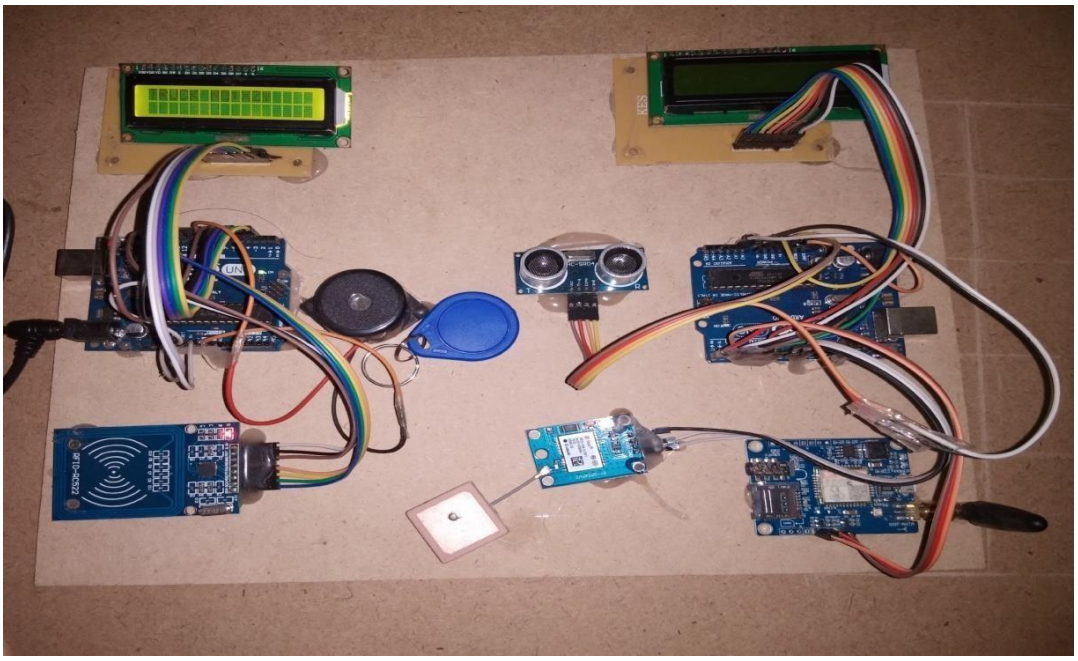


Fig6.1.2: Authorized and Unauthorized cards scanned to RFID

Fig 6.1.2 shows the Authorized and Unauthorized cards scanned to RFID. Authorized and Unauthorized cards are provided and the authorized person should have to scan the card to RFID scanner. If the authorized person scans the authorized card, the buzzer will shows the beep sound. This indicates that authorized person accessing the truck. And the truck number is displayed on the LCD screen as shown in Fig 6.1.2. If unauthorized person scan the card then buzzer wont produces any sound. It means that the person can not access the truck.

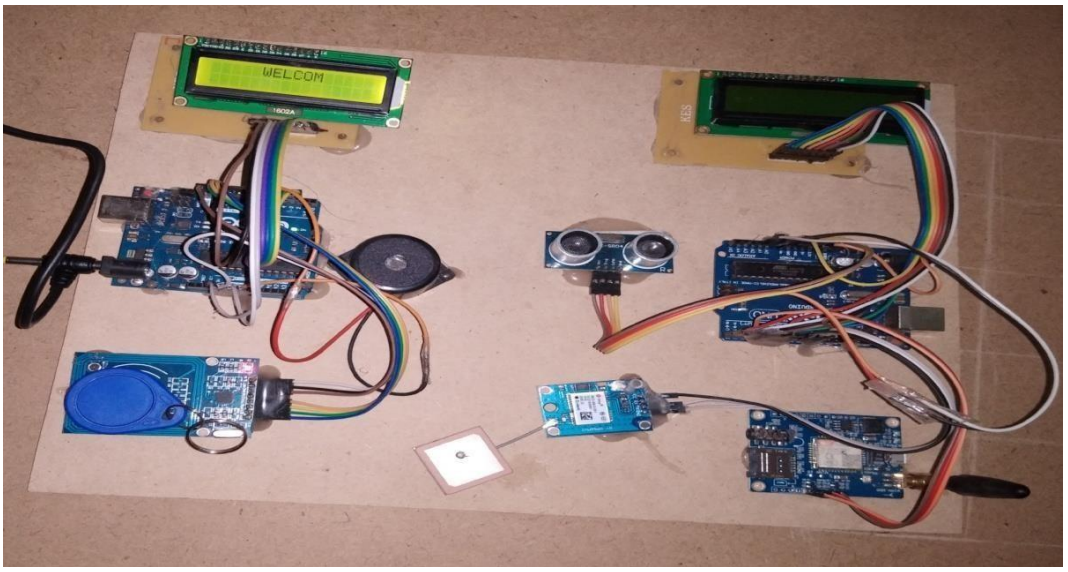


Fig6.1.3: Authorized key scanned to RFID Scanner

Fig 6.1.3 shows the authorized key scanned to RFID scanner. After scanning authorized card to RFID scanner, the person should scan the authorized key to RFID scanner. Until and unless the authorized person scans both authorized card and key, the person is not able to access the truck. If the key is authorized the LCD screen shows the authorized key and Welcome as shown in fig 6.1.3. The authorized person is now able to access the truck and the tracking of the vehicle is been initiated after scanning authorized card and key.

6.2.1.Locating: The location/location tracking is the second part of the hardwareimplementation.

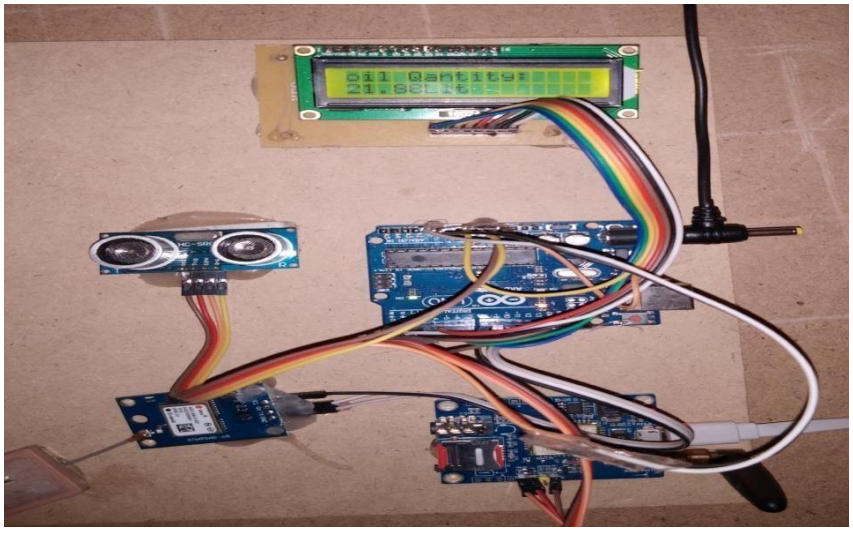


Fig6.2.1: LCD displays Quantity of oil in the truck

Fig 6.2.1 shows LCD displays Quantity of oil in the truck. After scanning with authorized card and key the tracking of the location of the truck will initiates. The owner of the truck can observe quantity of the oil. The tracking location part of hardware consists of LCD screen, Arduino board, GPS, Ultrasonic sensor and Antenna.

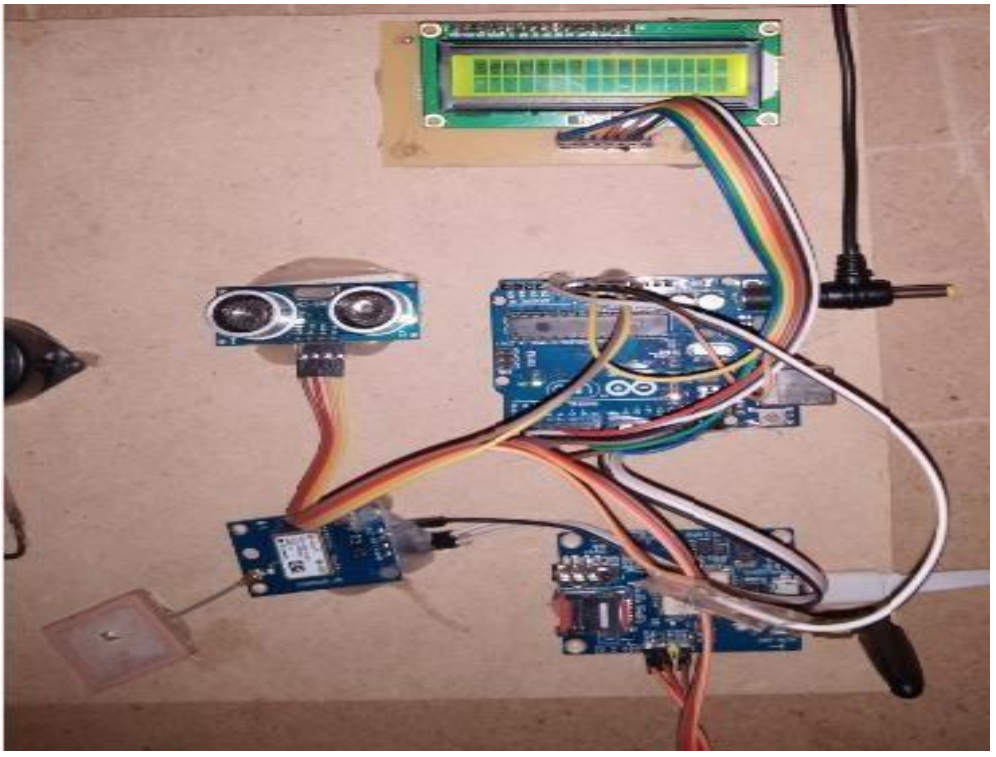


Fig6.2.2: GSM sends sms on malpractice

Fig 6.2.2 shows GSM sends sms on malpractice. The truck is provided with theultrasonic sensor in the oil tank. While truck moving if unknown theft malpractice the oil from the truck then the GSM sends the sms to the truck owner. GPS sends live location where the malpractice of the oil is taking place. The owner can take the further action against the theft. The antenna supports in sending sms and tracking live location of the truck. It continuously sends the location of the truck. If the driver met with any health issue then the truck will stop for longer time in the same place then theGSM sends sms that the truck stop in the same location for longer time.

6.2: Software Implementation:

Software implementation of the project can be carried out using Ardiuno IDE software. The Software code of the project can be dumped in the IC fitted to the ardiuno in the hardware connection to reduce the risk of interfacing problem.

6.2.1:Tracking result

The tracking of the truck is programmed in ardiuno IDE software which checks the proper functioning of the tracking part in the hardware.

Fig6.2.1: Compilation result of tracking

Fig 6.2.1 shows the compilation result of tracking. The program has LCD crystal, software serial header files. The result is successfully compiled. The maximum program storage space is 32256 bytes. After compilation the program has global variables that use 885 bytes of dynamic memory, the local variable uses 1163bytesand maximum the program uses thememory of 2041 bytes.

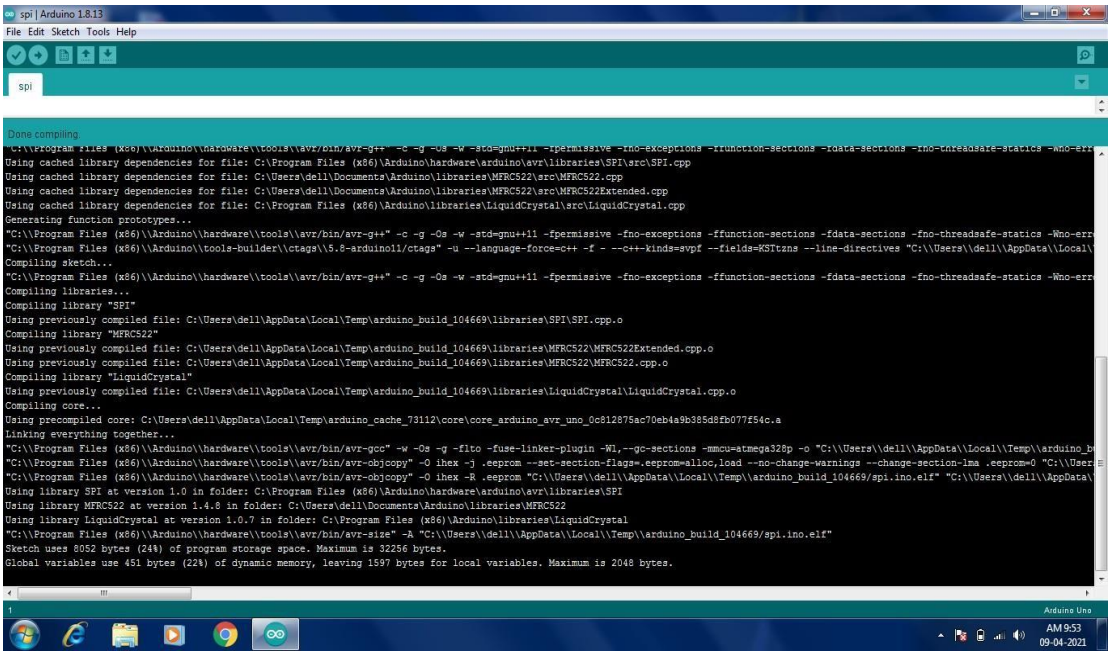


Fig6.2.2: Compilation result of location tracking.

Fig 6.2.2 shows Compilation result of location tracking. The program has SPI, MFRC522 and liquid crystal header files. In the program the owner mobile number is provided. The GPS, GSM, Ultrasonic sensors are programmed and compiled for the functioning checking. The programs uses global variable size of 451 bytes of dynamic memory, it uses local memory1597 bytes and total program uses 2048 memory size.

CONCLUSION:

This research proposes a new encrypted database that deals with petroleum product distribution information using EMBEDDED technology based on a consistent hash algorithm. A remote solution is also proposed to track the location and control the volume of petroleum, which is connected to a remote database and constantly adjusted with real-time data. The introduction of EMBEDDED Authorized Technology into a transaction created on the basis of previous transactions has proven its reliability, as it is not subject to record tampering, but allows access to any changes or modifications when the chain participants have more than 75% contract; Otherwise, permission will be denied. The records of this exchange are kept in a distributed ledger, allowing each party in the chain to see the data or knowledge transparently, while the decentralized distribution ledger provides impenetrable protection against manipulation using EMBEDDED encrypted hashing technology for data management and integrated protection. To protect military records, banking networks and ballot voting systems (BVS). In addition, potential studies may refer to analyzes that focus on the accuracy of knowledge gained from atomic markers about oil and gas products (fuel label program).

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