INDUSTRIAL SHOCK PREVENTION SYSTEM USING IOT

Mr. Govindaraj V*1, Keerthivasan E*2, Manikandan G*3,
Pragadeeswaran S*4, Silambarasan C*5

*1Assistant Professor, Department Of Electrical And Electronics Engineering, Karpagam College Of
Engineering, Coimbatore, Tamil Nadu, India.

*2,3,4,5Students, Department Of Electrical And Electronics Engineering, Karpagam College Of
Engineering, Coimbatore, Tamil Nadu, India.

DOI: https://www.doi.org/10.56726/IRJMETS30071

ABSTRACT

Due to the electric shock, many employees were slashed and killed every year. Death or injury isn't caused by
the voltage, the injury is caused by the number of current that flows through the body. the electrical is shock
protection by automatic disconnection of offer is given. Contact currents, that occur once an individual touches
a conducting surface higher potential, area unit wont to find if person is receiving a shock. just in case of shock,
contact currents flow through varied methods within the body as well as within the skin surface. The circuit
given here, to be worn on form touches the body surface. With the assistance of IOT technology, the precise
location and time info is found and also the electrical shock info area unit hold on for information records.
during this project is employed for the economic and residential functions it's primarily used for force field
employees. Whenever the human is electrocuted, the electrical shock is detected so the detected signal is
transmitted to the microcontroller misinterpretation RF transmitter and receiver. Arduino microcontroller
is employed to find the signal from RF receiver so microcontroller pass the management to relay which can trip
the most board. Then the alarm sounds because it is alert for the close users.

I. INTRODUCTION

The standard power offer utilized in homes and laboratories is 120V,60Hz curving system within the us and
220V, fifty rate in Republic of India. Associate contact with ungrounded conductor or with exposed
semiconductive components of electrical instrumentation as results of fault in basic insulation would end in an
electrical shock to the person. It might cause physical injury or death thanks to effects like fibrillation and
metabolic process arrest the protecting strategies embody instrumentation grounding, double insulation and
strategies supported automatic disconnection of offer. Following devices square measure familiar {to provide
to offer to produce} protection by automatic disconnection of power supply, in event of ground faults ensuing
from insulation breakdowns or contact with ungrounded offer conductor.
The standard issue faced by various farmers is attacks of wild animals on the farms. These attacks are not just
limited to specific areas. It is there with various sorts of wild creatures in various areas in the country. Farmers
are spending restless evenings guarding their farms. A portion of the arrangement farmers execute is an
electric fence around the farm. However, there are numerous disadvantages. Individuals going close to the
farms who are ignorant of the electric fence are going through electrical shocks and are losing their lives [1].
This project presents projected model for sensible Agriculture to develop real time observance system for
soil properties like Temperature, humidness and wet, crop yield identification mistreatment SMS primarily
based Alerts. It will be attainable to regulate varied operations of the sphere remotely from anywhere, anytime
by mobile moreover as net application. The IOT primarily based agricultural observance system has been used to
maximize the yield of crop by observance the environmental parameters and so providing the needed info to farmer remotely. This system will be enforced in any kind of agricultural field with variable soils [2].
With the advent of Internet of Things (IoT) and industrialization, the development of Information Technology
(IT) has led to various studies not only in industry but also in agriculture. Especially, IoT technology can
overcome distance and place constraints of wired communication systems used in existing farms, and can
expect agricultural IT development from automation of agricultural data collection [3]. Internet of Things (IoT)
plays a crucial role in smart agriculture. Smart farming is an emerging concept, because IoT sensors capable of
providing information about their agriculture fields. The paper aims making use of evolving technology i.e. IoT
and smart agriculture using automation. Monitoring environmental factors is the major factor to improve
the yield of the efficient crops. The feature of this paper includes monitoring temperature and humidity in
agricultural field through sensors using CC3200 single chip. Camera is interfaced with CC3200 to capture
images and send that pictures through MMS to farmers mobile using Wi-Fi [4].

II. PROPOSED METHOD

When human gets electrified and it’s detected. Then it’s transmitted victimization RF transmitter. RF receiver
receives the signal and given as a result of the input to the microcontroller. victimization relay, microcontroller
makes the foremost broad to drip. Location is detected victimization GPS. Microcontroller could also be a little
portable computer on one computer circuit containing a processor core, memory, programmable input and
output peripherals. Microcontroller boards square measure digital devices and interactive objects which can
sense and management objects. Microcontrollers square measure utilized in automatically controlled product
and devices.

The GPS is also a space-based navigation system that offers precise location and time knowledge altogether
weather conditions anywhere around earth. The GPS system does not would like the user to transmit any data
and it operates severally signal to cypher digital knowledge, and together demodulates such a carrier signal to
rewrite transmitted knowledge. The in operation of equipment unit of measurement voice calls, short message
service, GSM data calls, General Packet Radio Service.

III. BLOCK DIAGRAM

A. POWER SUPPLY

Power offer is AN integral half that plays a significant role in each electronic system and therefore their style
constitutes a significant half in each application. so as to beat mal-operation which ends up because of
fluctuations within the load and separation within the offer correct alternative of power offer could be a nice
want. The power offer circuit is made exploitation filters, rectifiers, so voltage regulators. beginning with analog
voltage, generally 220 Volts, is connected to a electrical
device, that steps that ac voltage right down to the
amount for the required dc output. A diode rectifier then provides a full-wave corrected voltage that’s at the
start filtered by a straightforward electrical device filter to provide a dc voltage. This ensuing dc voltage
sometimes has some ripple or ac voltage variation. A regulator circuit will use this dc input to supply a dc
current that not solely has abundant less ripple voltage however conjointly remains constant dc worth
notwithstanding the input dc voltage varies somewhat, or the load connected to the output dc voltage changes.
This voltage regulation is typically obtained exploitation one in all variety of common transformer IC units.

B. MICROCONTROLLER

Arduino is associate ASCII text file natural philosophy platform supported easy-to-use hardware and computer
code. Arduino boards area unit ready to scan inputs - light-weight on a device, a finger on a button, or a Twitter
message - and switch it into associate output - activating a motor, turning on associate semiconductor diode,
commercial enterprise one thing on-line. you'll be able to tell your board what to try and do by causing a collection of directions to the microcontroller on the board. to try and do thus you employ the Arduino programming language (based on Wiring), and also the Arduino computer code (IDE), primarily on process. Over the years Arduino based has been the brain of thousands of comes, from everyday objects to advanced scientific instr. A worldwide community of manufacturers - students, hobbyists, artists, programmers, and professionals - has gathered around this ASCII text file platform, their contributions have else up to a fantastic quantity of accessible data that may be of nice facilitate to novices associate specialists alike. Arduino was born at the Ivrea Interaction style Institute as a simple tool for quick prototyping, aimed toward students while not a background in natural philosophy and programming. As shortly because it reached a wider community, the Arduino board started dynamic to adapt to new wants and challenges, differentiating its provide from straightforward 8-bit boards to product for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards area unit utterly ASCII text file, empowering users to make them severally and eventually adapt them to their specific wants.

C. GPS TECHNOLOGY

For people who area unit unfamiliar the term, GPS stands for international Positioning System, and could be a method of locating a receiver in 3 dimensional house anyplace on the planet, and even in orbit concerning it. GPS is arguably one among the foremost vital inventions of our time, and has such a lot of completely different applications that several technologies and ways that of operating area unit frequently being improved so as to create the foremost of it. To understand specifically why it's therefore helpful and vital, we must always 1st check up on however GPS works. a lot of significantly, watching what technological achievements have driven the event of this fascinating positioning system. In order for GPS to figure, a network of satellites was placed into orbit around planet Earth, every broadcasting a selected signal, very similar to a traditional radio wave. This signal is often received by an occasional value, low technology aerial, even if the signal is incredibly weak. The information is particular enough that the GPS software system will establish the satellite, it's location in house, and calculates the time that the signal took to travel from the satellite to the GPS receiver. Using signals from different satellites, the GPS software system is in a position to calculate the position of the receiver. The principle is incredibly just like that that is employed in orienteering – if you'll establish 3 places on your map, take an impression to wherever they are, and draw 3 lines on the map, then you'll conclude wherever you're on the map. The lines can ran into, and, reckoning on the accuracy of the bearings, constellation that they type wherever they ran into can approximate your position, at intervals a margin of error. GPS software system performs an identical quite exercise, victimization the well-known positions of the satellites in house, and measure the time that the signal has taken to travel from the satellite to Earth.
D. LCD

Liquid crystal displays (LCDs) have materials that mix the properties of each liquids and crystals. Instead of having a temperature, they need a temperature vary at intervals that the molecules square measure nearly as mobile as they’d be in a very liquid, however square measure classified along in Associate in Nursing ordered type almost like a crystal. An liquid crystal display consists of 2 glass panels, with the liquid material sand witched in between them. The inner surface of the glass plates square measure coated with clear electrodes that outline the character, symbols or patterns to be displayed compound layers square measure measure gift in between the electrodes and also the liquid, that makes the liquid molecules to keep up an outlined orientation angle. One every polarizes square measure affixed outside the 2 glass panels. These polarizes would rotate the sunshine rays passing through them to a particular angle, in a very specific direction. once the liquid crystal display is within the off state, lightweight rays square measure revolved by the 2 polarizes and also the liquid, such the sunshine rays kick off of the liquid crystal display with none orientation, and therefore the liquid crystal display seems clear. once ample voltage is applied to the electrodes, the liquid molecules would be aligned in a very specific direction. the sunshine rays passing through the liquid crystal display would be revolved by the polarizes, which might lead to activating / light the required characters. The LCD’s square measure light-weight with solely a number of millimeters thickness. Since the LCD’s consume less power, they’re compatible with low power electronic circuits, and might be supercharged for long durations. The show lcd| digital| display| alphanumeric display doesn’t generate lightweight so lightweight is required to scan the display. By victimization backlighting, reading is feasible within the dark. The LCD’s have long life and a large operational temperature vary. dynamical the show size or the layout size is comparatively straightforward that makes the LCD’s a lot of customers friendly.

E. ALARM TRIPPING CIRCUIT

In this circuit is intended to tripping the most provide and cut the facility provide, buzzer is ON within the reason of someone electrocuted the person is traditional condition the person tripping ON then the buzzer is OFF.

F. RF MODULE

An RF module (radio frequency module) could be a (usually) little electronic circuit accustomed transmit and/or receive radio signals on one in all variety of carrier frequencies. RF modules are wide utilized in electronic style because of the issue of planning radio electronic equipment. sensibl e electronic radio style is notoriously complicated due to the sensitivity of radio circuits and also the accuracy of parts and layouts needed to attain operation on a particular frequency. style engineers can style a circuit for AN application which needs radio communication then “drop in” a radio module rather than try a distinct style, saving time and cash on development. RF modules almost frequently utilized in medium and low volume merchandise for
client applications like garage door openers, wireless alarm systems, industrial remote controls, good device applications, and wireless home automation systems. They are generally accustomed replace older below red communication styles as they need the advantage of not requiring line-of-sight operation several. Carrier frequencies are ordinarily utilized in commercially-available RF modules, as well as 433.92 MHz, 315 MHz, 868 Mc and 915 Mc. These frequencies are used due to national and international laws governing the use of radio for communication.

G. WIFI MODULE

Devices that may use Wi-Fi technology embody personal computers, video-game consoles, smartphones and tablets, digital cameras, smart TVs, digital audio players and trendy printers. Wi-Fi compatible devices will connect with the web via a local area network and a wireless access purpose. Such associate degree access purpose (or hotspot) contains a vary of concerning twenty meters (66 feet) inside and a larger vary outdoors. Hotspot coverage are often as little as one space with walls that block radio waves, or as massive as several sq. kilometers achieved by mistreatment multiple overlapping access points. Wi-Fi most ordinarily uses the two.4 Gc (12 cm) radio frequency and five.8 Gc (5 cm) radio frequency belief radio bands, these bands area unit divided into multiple channels. Every channel are often time-shared by multiple networks. These wavelengths work best for line-of-sight. Several common materials absorb or mirror them, that more restricts vary, however will tend to assist minimize interference between totally different networks in thronged environments. At shut vary, some versions of Wi-Fi, running on appropriate hardware are able to do speeds of over one Gbps. Anyone inside vary with a wireless network interface controller will decide to access a network; owing to this, Wi-Fi is additional susceptible to attack (called eavesdropping) than wired networks. Wi-Fi Protected Access could be a family of technologies created to shield data moving across Wi-Fi networks and includes solutions for private and enterprise networks. Safety features of Wi-Fi Protected Access have enclosed stronger protections and new security practices because the security landscape has modified over time. To connect to a Wi-Fi LAN, a laptop should be equipped with a wireless network interface controller. The mixture of laptop and interface controllers is named a station. For all stations that share one frequency line, transmissions on this channel area unit received by all stations inside vary. The transmission isn't certain to be delivered and is so a best-effort delivery mechanism. A carrier is employed to transmit the information. The information is organized in packets on associate degree local area network link, stated as "Ethernet frames". Each service set has associate degree symbol, the 32-byte Service Set symbol (SSID), that identifies the actual network. The SSID is organized inside the devices that area unit thought of a part of the network, and it's transmitted within the packets. Receivers ignore wireless packets from networks with a distinct SSID.
IV. SOFTWARE TOOLS

Keil development tools for the 8051 Microcontroller design support each level of software package developer from the skilled applications engineer to the scholar simply learning concerning embedded software package development. The industry-standard Keil C Compilers, Macro Assemblers, Debuggers, time period Kernels, Single-board Computers, and Emulators support all 8051 derivatives and assist you get your comes completed on schedule. The Keil 8051 Development Tools area unit designed to unravel the complicated issues facing embedded software package developers. When beginning a brand new project, merely choose the microcontroller you utilize from the Device information and also the µVision IDE sets all compiler, assembler, linker, and memory choices for you. Numerous example programs area unit enclosed to assist you start with the foremost fashionable embedded 8051 devices. The Keil µVision program accurately simulates on-chip peripherals (I²C, CAN, UART, SPI, Interrupts, I/O Ports, A/D device, D/A device, and PWM Modules) of your 8051 device. Simulation helps you perceive hardware configurations and avoids time waste don setup issues. in addition, with simulation, you'll write and check applications before target hardware is obtainable after you area unit able to begin testing your software package application with target hardware, use the MON51, MON390, MONADI, or FlashMON51 Target Monitors, the ISD51 In-System program, or the ULINK USB-JTAG Adapter to transfer and test program code on your target system. It's been instructed that there area unit currently as many embedded systems in everyday use as there area unit individuals on planet Earth. Domestic appliances from laundry machines to TVs, video recorders and mobile phones, currently embrace a minimum of one embedded processor. they're additionally very important elements in a very large kind of automotive, medical, region and military systems. As a result, there's sturdy demand for programmers with ‘embedded’ skills, and lots of desktop developers area unit stepping into this space. Embedded C is intended for programmers with desktop expertise in C, C++ or Java who wish to find out the abilities needed for the distinctive challenges of embedded systems. specialists alike. Arduino was born at the Ivrea Interaction style Institute as a straightforward tool for quick prototyping, geared toward students while not a background in natural philosophy and programming. As shortly because it reached a wider community, the Arduino board started ever-changing to adapt to new desires and challenges, differentiating its supply from straightforward 8-bit boards to merchandise for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards area unit fully ASCII text file, empowering users to make them severally and eventually adapt them to their explicit desires.

V. HARDWARE SETUP

This proposed system contains a voltage regulator, an RF transmitter, a receiver, an Arduino, GPS, and Wi-Fi module, a led, a buffer alarm, and the relay unit. Here, a 230V input supply is applied to the system and that is converted into 12V by using a step-down transformer. Then the IOT-based Blynk app is used to check the status of the network power supply.

At initial operating conditions, the LCD displays show "Normal Safe Running" at the same time the corresponding location is denoted by the Blynk app. In addition to this, it shows latitude and longitude as "No Signal" and also shows line status as "Safe".
A copper ring is used to make the fault to activate the Arduino and buffer alarm. Sometimes, due to any error of the transmission line due to natural or human made faults, this copper ring makes a short circuit and the RF transmitter attached to the copper ring sends the signal to the receiver.

Once the RF receiver receives the signal, then Arduino activates the buffer alarm and also the Blynk app to display the latitude and longitude location with an alert message as "Earth Shock Alert" and the LCD display as "Shock Detected". Finally, the relay unit cut off the main power supply to the proposed system.

**VI. CONCLUSION**

This project could also be enforced within the industries i.e., to speak between the staffs or staff additionally to the current we have a tendency to might implement it within the homes wherever there's a desire. In future we will add rather more management appliances. it's a stunning issue to those that area unit in business or in alternative activities. it’s a more cost-effective one so all the individuals are often monitored and implement this in day- these days life. In future we will access the info a lot of and equally we will increase speed per the requirement.

**VII. REFERENCE**


