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# DESIGN AND IMPLEMENTATION OF A DROWNING DETECTION AND RESCUE SYSTEM USING WIRELESS SENSOR NETWORK

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**Abstract -** *For quite a while, suffocating has been a huge ground for death around the world; it represents the third reason for impromptu passing universally, with about 1.2 million cases yearly. Naturally it influences swimmers, mishap casualties, youngsters and sporting looking for people. Despite the fact that there have been different arrangements set up from suffocating in certain nations, it actually represents the essential driver of impromptu demise. Annihilation instead of fix has had the option to limit the quantity of people who suffocate for the most part, besides in non-industrial countries, who need satisfactory instructive offices and implementation of wellbeing measures on the perils of suffocating, subsequently making the weight of suffocating to raise. The proposed drowning rescue system aims to curb deaths from drowning by using differential conductivity sensor that can detect drowning incidents in swimming pools and ocean at the earliest possible stage, if endangered, the relay gets activated and supply the oxygen through oxygen pump to person in danger to give him immediate life support and also the system sends signals from the wearable device attached to the wrist and neck of the victim who may be undergoing a near-drowning experience to the receiver or rescuer who could be a lifeguard, parent, neighbor or marine safety in-charge, in order to enable the rescuer render immediate help. This signal transfer from transmitter to receiver is done using wireless communication. This simple technique has an advantage of convenience and cost saving.*

***Key Words:*** AVR controller, Conductivity sensor , Transmitter, Oxygen pump, Electromechanical Relay.

## 1.INTRODUCTION

Swimming is a most loved exercise, however in the water, amateurs regularly can't be allowed to inhale activity and cause gagging water, at that point loss of equilibrium and cause a suffocating mishap. Some exceptional conditions, like spasms, slam into one another, sickness or mental pressure, etc, may likewise cause swimmer suffocating. Suffocating is a main source of death and inability for kids. Around the world, suffocating produces a higher pace of mortality than some other reason for injury in kids under 15 years old. Little youngsters younger than five are at specific danger, enduring the most elevated suffocating death rates around the world. As per the Centers for Disease Control and Prevention, roughly 1,000 kids bite the dust from suffocating yearly on the planet. Little youngsters younger than five are at specific danger, enduring the most elevated suffocating death rates around the world. Throughout the long term, inadvertent injury passings came about by suffocating have been on an ascent. Indeed, it records to be the third significant reason concerning something similar, and 7% of all passings that are injury-related. It is speculated that about 372,000 people round the globe per annum lose their lives as a result of drowning. To put it in facts, about 42 drowning deaths occur on a per hour per day basis. In general, it is seen that in the primary stages of the drowning process, there is relatively meagre water that enters into the lungs due to which a small amount of water enters the trachea resulting in a muscular spasm. Consequently, the airway is sealed while preventing the imperative path for both air and water till the time person becomes unconscious. Thereby, an individual who is drowning would not be able to shout or to make a call for rescue. Non interruption of the process leads to loss of consciousness resulting from hypoxia which is quite quickly followed by cardiac arrest. However, at this point of time, the aforesaid process can still be reversed on account of immediate and efficient rescue. The duration of immersion is strongly concerned to the rate of survival of an individual. Thereby, if an individual who is undergoing drowning is brought back to the floor within a stipulated time, the eventual death can be averted. In this project to avoid drowning accidents automatically by using the conductivity sensor continuously measured and monitored by the microcontroller. When the current value surpasses the threshold limit an alerting signal is sent to the receiver. The wireless transmission and reception of signals is done through HC-05 module. On receiving the valid signal microcontroller.

## 2. EXISTING METHOD

The wearable drowning monitor device can detect drowning accident and alarm. The device has four main modules, including microprocessor, power module, SD memory card module, LED warning module, water pressure sensor module. When swimming the human arm must constantly waving in the water, if drowning, arm motion of floating is significantly reduced, and if falling into the water, almost motionless. According to the physiological response of human drowning, it can detect drowning accident.

## 3.PROPOSED SYSTEM

In the proposed method the human identification depends on the sensor and wireless communication. First, data from a conductivity sensor is used to judge whether the human body in the water, if the body is drowning in the water 10 seconds the condition will be conformed , then the human in critical level the relay will activate the oxygen pump in danger condition , the system sends signals from the wearable device attached to the wrist and neck of the victim who maybe undergoing a near-drowning experience to the receiver .The signal can be transmitted to receiver through wireless communication. Here we are using a microcontroller to control the whole process. When the sensor value will be keep monitoring in control room. The sensor value will be changed with respect to the human movement in water the information sends to control room and safeguard the person. The main advantages of this system are proper communication in transmitter to receiver.This system safeguards the person in dangerous condition and provide oxygen supply to the person in critical condition.

## 4.BLOCK DIAGRAM

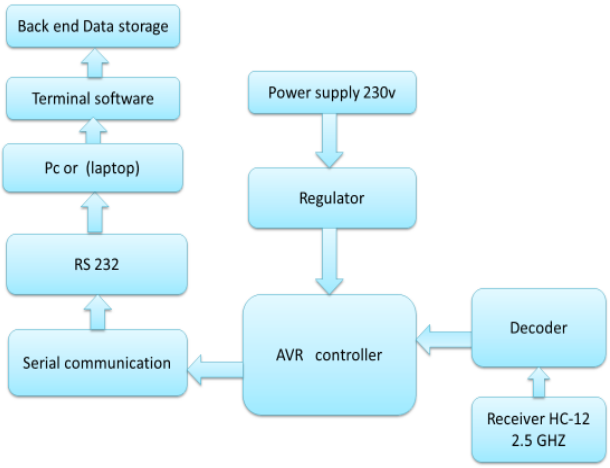


**Fig 1:**TRANSMITTER SIDE

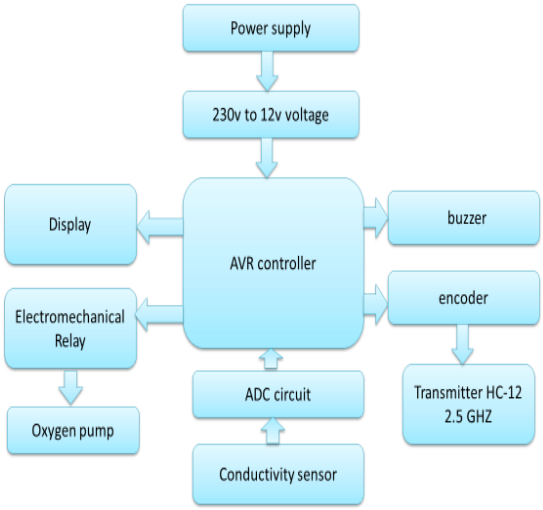


**Fig 2:** RECEIVER SIDE

The principle capacity of the CPU center is to guarantee right program execution. The CPU should accordingly have the option to get to recollections, perform estimations, control peripherals, and handle intrudes.. Square Diagram of the AVR Architecture In request to boost execution and parallelism, the AVR utilizes a Harvard design – with discrete recollections and transports for program and information. Directions in the program memory are executed with a solitary level pipelining. While one guidance is being executed, the following guidance is pre-brought from the program memory. This idea empowers directions to be executed in each clock cycle. The program memory is In-System Reprogrammable Flash memory. The quick access Register File contains 32 x 8-digit broadly useful working registers with a solitary clock cycle access time. This permits single-cycle Arithmetic Logic Unit (ALU) activity. The AVR gives a few diverse interfere with sources. These hinders and the different Reset Vector each have a different program vector in the program memory space. All hinders are doled out individual empower bits which should be composed rationale one along with the Global Interrupt Enable piece in the Status Register to empower the intrude. Contingent upon the Program Counter worth, hinders might be consequently impaired when Boot Lock bits BLB02 or BLB12are customized. This component improves programming security. The most reduced locations in the program memory space are as a matter of course characterized as the Reset and Interrupt Vectors. The rundown likewise decides the need levels of the various interferes. The lower the location the higher is the need level. RESET has the most elevated need, and next is INT0 – the External Interrupt Request 0. The Interrupt Vectors can be moved to the beginning of the Boot Flash area by setting the IVSEL bit in the MCU Control Register (MCUCR). The Reset Vector can likewise be moved to the beginning of the Boot Flash area by programming the BOOTRST Fuse. At the point when a hinder happens, the Global Interrupt Enable

I-cycle is cleared and all hinders are handicapped. The client programming can compose rationale one to the I-cycle to empower settled interferes. All empowered hinders would then be able to intrude on the current interfere with schedule. Allow us to expect that the transformer is working appropriately and there is a positive potential, at point An and a negative potential at point B. The positive potential at point A will advance predisposition D3 and converse inclination D4. The negative potential at point B will propel inclination D1 and talk D2. As of now the D3 and D1 are forward uneven and will allow current stream to go through them; D4 and D2 are talk uneven and will obstruct current stream. The route for current stream is from point B through D1, up through RL, through D3, through the helper of the transformer back to point B. This way is shown by the solid bolts. Waveforms (1) and (2) can be seen across D1 and D3.One-half cycle later the furthest point across the discretionary of the transformer banter, forward biasing D2 and D4 and inverse biasing D1 and D3. The current stream will by and by be from point A through D4, up through RL, through D2, through the assistant of T1, and back to point A. This way is exhibited by the wrecked bolts. Waveforms (3) and (4) can be seen across D2 and D4. The current travel through RL is reliably a comparable way. In flowing through RL this current develops a voltage contrasting with that shown waveform (5). Since current travels through the load (RL) during both half examples of the applied voltage, this framework rectifier is a full-wave rectifier. One benefit of a scaffold rectifier over a customary full-wave rectifier is that with a given transformer the extension rectifier delivers a voltage yield that is almost double that of the traditional full-wave circuit. This might be appeared by relegating esteems to a portion of the segments appeared in sees An and B. Expect that a similar transformer is utilized in the two circuits. The pinnacle voltage created between focuses X and y is 1000 volts in the two circuits. Since only one diode can lead at any moment, the most extreme voltage that can be redressed at any moment is 500 volts. The most extreme voltage that shows up across the heap resistor is almost however never surpasses 500 v0lts, because of the little voltage drop across the diode. In the extension rectifier appeared in see B, the most extreme voltage that can be corrected is the full auxiliary voltage, which is 1000 volts. Along these lines, the pinnacle yield voltage across the heap resistor is almost 1000 volts. With the two circuits utilizing a similar transformer, the scaffold rectifier circuit delivers a higher yield voltage than the ordinary ull-wave rectifier circuit.

## 5.EXPERIMENTAL OUTPUT

The main advantages of this system are proper communication in transmitter to receiver. This system safeguards the person in dangerous condition and provide oxygen supply to the person in critical condition.

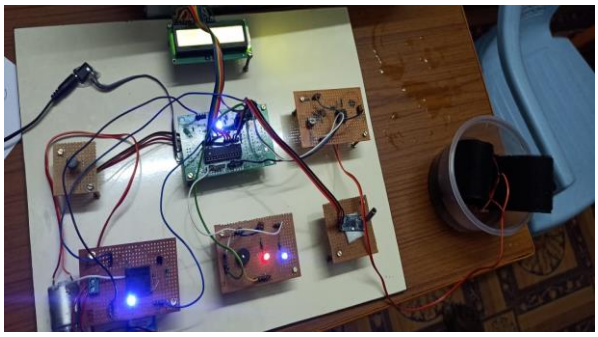

**Fig 3:**Experimental Output Kit


**Fig 4:** Monitoring in LCD Dispaly

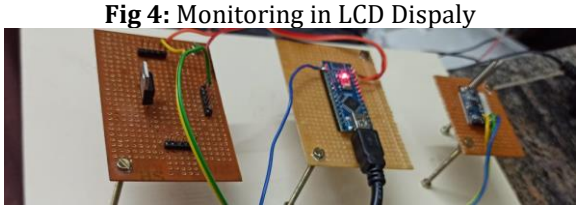

**Fig 5 :**AVR Controller

## 6.CONCLUSIONS

The Drowning Detection System device has been successfully built and tested. The system used conductivity sensor to measure the body in water or not .The data have been updated and transmitted to the monitoring system in real-time. The lifeguard and parents able to monitor the condition of the infant. Providing both detection and rescue automatic oxygen pump activate is found to be the most suitable, cost effective and reliable solution of all the available methods.

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