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Smart Communication System for Human Life Safety System with Electrical Information

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Abstract- A device providing for discharging and a grounded object to prevent unpleasant static shock to the person includes housing supporting a first contact arranged for manual engagement. A second contact for contacting the grounded object and a conductor of high resistance there between for allowing transmission of current at a rate which is sufficiently low to avoid shock. An electric shock preventer provides electrical shock protection for human, which consist of shock sensing element and transceiver module. An IOT based control system will introduce the early warning and control technique for the electrical shock.

Keywords:- WUSN, WSN, CMOS.

I. INTRODUCTION

An electric shock is the effect of passing an electric current through the body. The minimum current a human can feel is thought to be about 1 milli Ampere (m A). The effect can range from minor tingling to muscle spasms, tissue damage, fibrillation of the heart, loss of consciousness, and even death.

These effects depend on a variety of factors, including the strength of the current, duration of the current, the area of the body through which the current passes, and whether the person is grounded or insulated from the ground. Death caused by an electric shock is referred to as electrocution. The RF Transceiver uses RF modules for high speed data transmission in the digital-RF architecture works at speeds up to 433 MHZ.

II. BLOCK DIAGRAM

The power supply unit is used to gives the operating voltage for the constrained device as comparator, voltage sensing unit and reference unit. Then the comparator act the major role in this circuit. It is used to compare the two voltage level they are human body voltage (v1) and Reference voltage (v2). When the v1 voltages are greater than the v2 voltage. In this condition the comparator is produced the output signal. This signal is goes to microcontroller unit PIC16F877A.The input signal is flowing through the microcontroller in continuously.

In this condition the microcontroller is generating the controlling signal. And this signal is applied to the relay drive. The relay drive is used to drive the relay unit. The relay is got any input signal through the relay drives. It will be tripped off during fault condition.

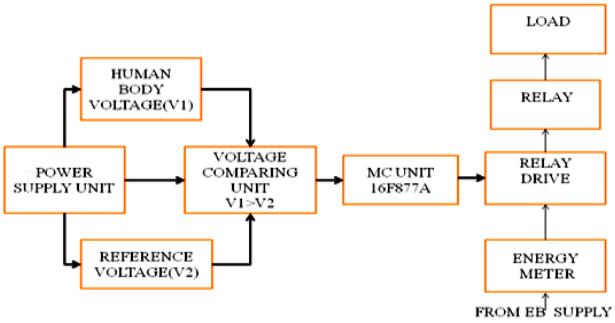

Fig 1. Block diagram.

III. COMPONENTS AND WORKING

1. Transformer:

A transformer is a static device that transfers electrical energy from one circuit to another through inductively coupled conductors—the transformer's coils. A varying current in the first or primary winding

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creates a varying magnetic flux in the transformer's core and thus a varying magnetic field through the secondary winding.

This varying magnetic field induces a varying electromotive force (EMF) or "voltage" in the secondary winding. This effect is called mutual induction

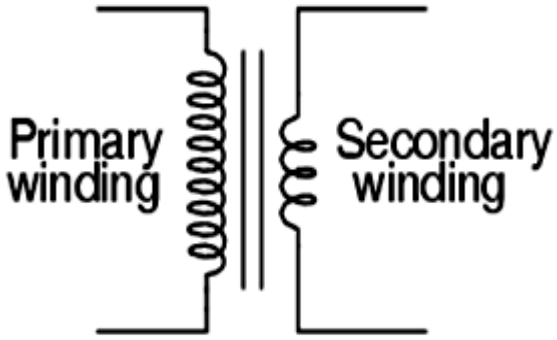

Fig 2. Transformer.

This is a very useful device, indeed. With it, we can easily multiply or divide voltage and current in AC circuits.

Indeed, the transformer has made long-distance transmission of electric power a practical reality, as AC voltage can be "stepped up" and current "stepped down" for reduced wire resistance power losses along power lines connecting generating stations with loads. At either end (both the generator and at the loads), voltage levels are reduced by transformers for safer operation and less expensive equipment.

2. Rectifier:

A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which is in only one direction, a process known as rectification. Rectifiers have many uses including as components of power supplies and as detectors of radio signals.4

2.1 Half Wave Rectifier: In half wave rectification, either the positive or negative half of the AC wave is passed, while the other half is blocked. Because only one half of the input waveform reaches the output, it is very inefficient if used for power transfer. Half-wave rectification can be achieved with a single diode in a one-phase supply, or with three diodes in a three-phase supply.

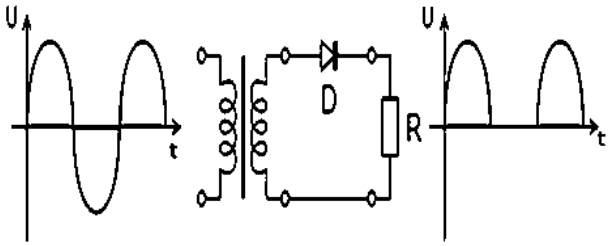

Fig 3. Half Wave Rectifier.

2.2 Full Wave Rectifier: One method to improve on this is to use every half-cycle of the input voltage instead of every other half-cycle.

The circuit which allows us to do this is called a Full Wave Rectifier. Like the half wave circuit, a full wave rectifier circuit produces an output voltage or current which is purely DC or has some specified DC component. Full wave rectifiers have some fundamental advantages over their half wave rectifier counterparts.

The average (DC) output voltage is higher than for half wave, the output of the full wave rectifier has much less ripple than that of the half wave rectifier producing a smoother output waveform.

In a Full Wave Rectifier circuit two diodes are now used, one for each half of the cycle. This configuration results in each diode conducting in turn when its anode terminal is positive with respect to the transformer centre point C producing an output during both half-cycles twice that for the half wave rectifier so it is 100% efficient.

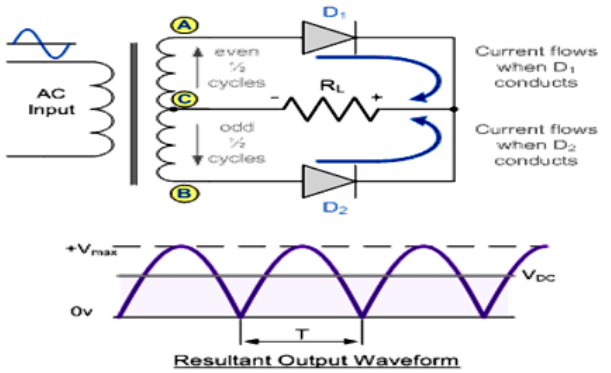

Fig 4. Full Wave Rectifier.

The full wave rectifier circuit consists of two power diodes connected to a single load resistance (RL) with each diode taking it in turn to supply current to the load. When point A of the transformer is positive

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with respect to point B, diode D1 conducts in the forward direction as indicated by the arrows.

When point B is positive (in the negative half of the cycle) with respect to point A, diode D2 conducts in the forward direction and the current flowing through resistor R is in the same direction for both circuits. As the output voltage across the resistor R is the pharos sum of the two waveforms combined, this type of full wave rectifier circuit is also known as a "bi-phase" circuit.

3. IR Sensor:

This Medium Range Infrared sensor offers simple, user friendly and fast obstacle detection using infrared; it is non-contact detection.

The implementations of modulated IR signal immune the sensor to the interferences caused by the normal light of a light bulb or the sun light. Infrared (IR) technology addresses a broad variety of wireless applications, especially in the areas of sensing and remote control.

Today's newest products such as cell phones, digital cameras, and DVD players as well as remote controls for every market segment rely on IR sensing and control devices. ROHM Semiconductor has been driving technology advances that have led to a growing number of IR sensing and communication applications.

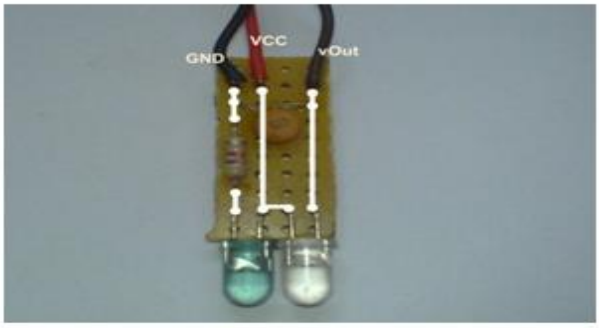

Fig 5. IR Sensor.

4. LCD Display:

The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580. we will discuss about character based LCDs, their interfacing with various microcontrollers, various interfaces (8-bit/4-bit), programming, special stuff and tricks you can do with these simple looking LCDs which can give a new look to your application. For Specs and technical information HD44780 controller.

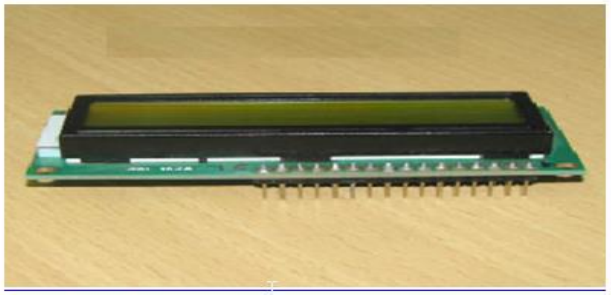

Fig 6. LCD Display.

IV. CONCLUSION

The protection practice against electric shock points to solve the contact "collision" by the active measure of automatic disconnection limiting the time duration. Analyzing the components of electric hazard as waves evolving in time, the fault opens a time window of risk, and the protection has to close it.

In electrical installations, safe protection is conventionally guaranteed if the colliding time makes permissible the prospected touch voltage or at least assumes a value as low as possible (additional protection).

In fact, as a minimal objective, the protection has to limit fault exposure persistence in a conventional time (probable protection).

In a complementary way, operating on the single components of the electrical installation in the case of portable (mobile) electrical equipment, a practical recommendable criterion to avoid or mitigate the injury or damage occurring with electrical equipment is to prevent the appearance of electrical potential using double insulation and Class II equipment. Whereas in the case of fixed electrical equipment, it can be sufficient to limit the persistence of electrical potential by grounding and automatic disconnection of supply.

V. FUTURE ENHANCEMENT

Workers in building construction can use this application where as they will be using driller machine and more electrical appliances for construction. It can be used in automobile industries.

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It helps the people who works in the industries, where they use more electricity and more electrical equipment.

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