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SMART EARTHING MONITORING SYSTEM

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ABSTRACT :-

Earthing is the process of connecting any non-current carrying conductor component of an electrical system to the earth's general mass so that, in the event that an electrical potential is created at that location, electrical energy is immediately discharged to the ground. For instance, the earth terminal of three-pin socket outlets, stay wires, the neutral point of single- and three-phase supply systems, and the steel frame of electrical appliances and cables must all be correctly earthed. In order to do this, we created a clever plan for the automatic moisture maintenance system and smart moisture sensor. Avoiding electrical shocks to humans and other living things is another benefit of proper earthing.

INTRODUCTION :

uses for embedded systems are growing in the fields of industrial automation, automotive, power electronics, and defense and space equipment in addition to domestic uses.

We have just developed a cutting-edge technological alternative for the traditional earthing method. We employed an automation system for this. We made use of the Arduino, a contemporary microcontroller. We can keep the earthing moist with the aid of Arduino. We can keep the individual system's earthing going by utilizing a moisture sensor in the earthing pit. The system operates entirely on its own without the need for human intervention. The electrical earthing system has never used this technology previously.

This method allows us to provide appropriate earthing to prevent leakage currents in specific electrical equipment (such as transformers, motors, etc.) situated in electrical areas (such as generating stations, substations, industries, etc.). Additionally, we can prevent mishaps brought on by the earthing system failing.

OBJECTIVE OF THE PROJECT :

Objective:

a) Monitors the integrity and performance of the earthing system in real-time.
b) Alerts users (maintenance teams or system operators) of faults such as increased earth resistance, disconnections, or degraded ground connections.
c) Provides automated maintenance recommendations and diagnostics.
d) Helps in compliance with electrical safety standards by ensuring the proper operation of the earthing system at all times.
e) Minimizes the risks of electrical hazards, reducing downtime and damage to electrical equipment.

LITERATURE SURVEY :

Electrical & Electronics Engineer, Mr. Prajwal, K.S. "The necessity of earthing in electrical installations. Electrical appliances and equipment that have been properly designed, built, and installed shouldn't have any non-current carrying conducting parts that come into contact with any current carrying parts. However, if any of the non-current carrying conducting parts of the equipment or appliance come into contact with any of the current carrying parts, a static electrical charge will develop in the non-current carrying conducting part. This could happen unintentionally because the insulation between the current carrying and non-current carrying conducting parts of the equipment or appliance failed. Now, if a human touches that non-current carrying conducting element of the appliance or equipment, the collected static charge will go through his body to the ground and be released instantly, giving him an electrical shock. However, if the metallic frameworks of the equipment or appliance that carry current are properly earthed, then when any current-carrying or live parts of the equipment or appliance touch the non-current-carrying parts of the equipment or appliance, the live part of the equipment or appliance receives a low impedance path to the earth through the properly earthed metallic frameworks, a massive current will be drawn from the source and pass to the earth through this path. The circuit breaker, MCB, or fuses connected to this equipment or appliance will consequently instantly trip, cutting off the power to the device. Therefore, operational safety is ensured by properly earthing the metallic components of electrical

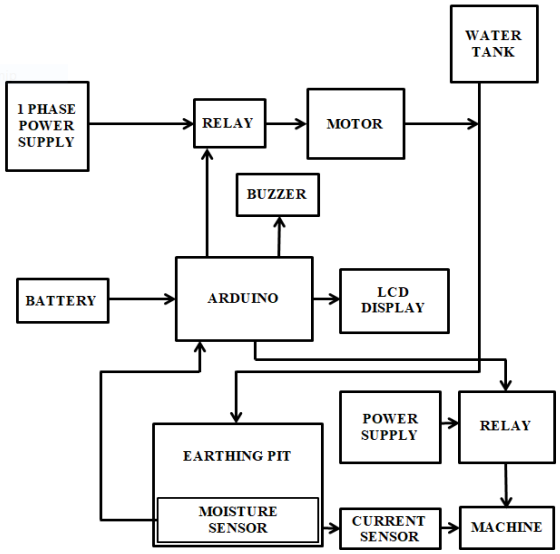
appliances and equipment that transport non-current.

To put it simply, earthing is the process of delivering unwanted electricity to earth through an earth pit. This can happen in the shield of the signal cable through interference or in the body of any instrument, such as a washing machine, freezer, air conditioner, lathe, electrical motors, etc. There are two more names for this as well. such as shield earthing, instrument earthing, system earthing, panel earthing, and electronic earthing. Using shielded cables with one end earhed not only protects people and equipment, but it also improves communication in the event of 4-20ma, 0-10V, etc.

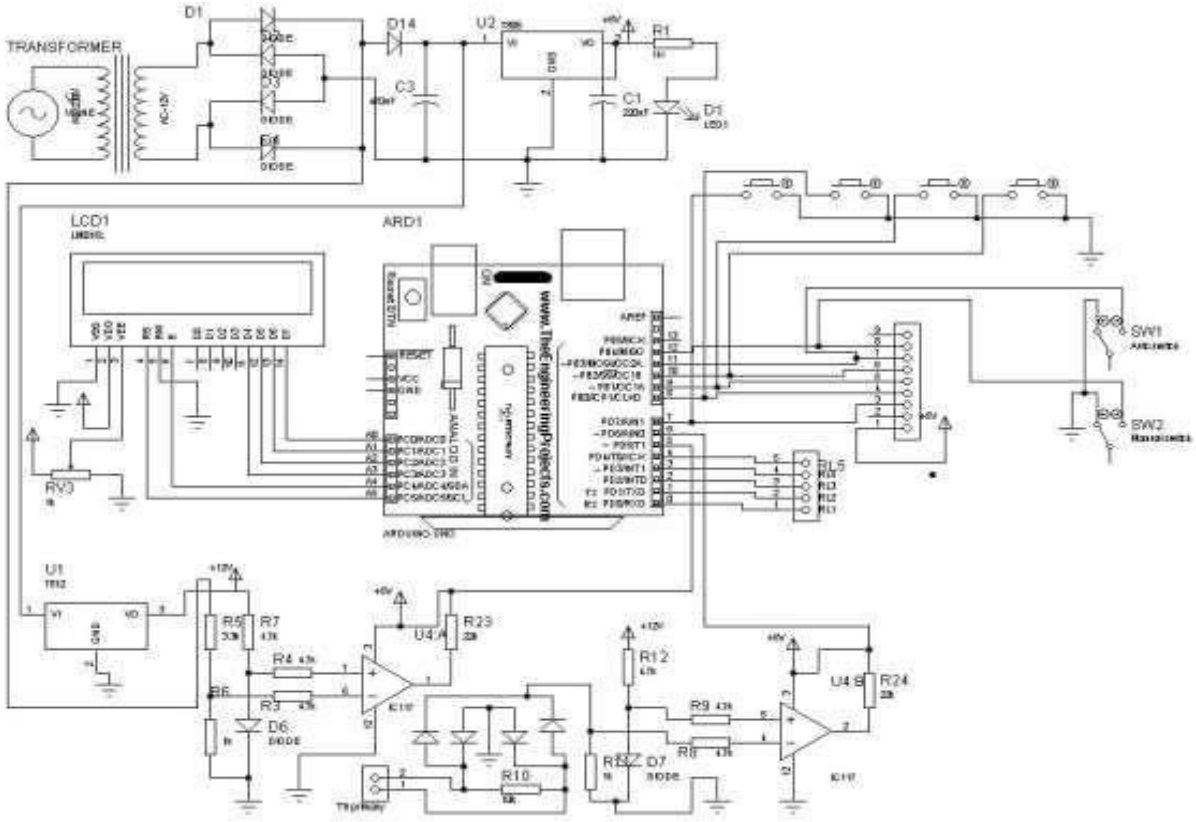
PROBLEM STATEMENTS :

By giving fault currents a safe route to the ground, the earthing (or grounding) system is essential to the safety of many electrical systems, particularly those found in commercial, residential, and industrial structures. But conventional earthing systems are frequently passive and don't have real-time monitoring, which can result in equipment damage, dangerous situations, and malfunctions that go unnoticed.
In the event of problems such as damaged ground connections, elevated earth resistance, or other failures, the current earthing systems are unable to promptly notify users. As a result, electrical systems are susceptible to fires, electrical shocks, and equipment failures that could go unnoticed for a long time.

PROPOSED SYSTEM MODEL :



CIRCUIT DIAGRAM :



ADVANTAGES

1. No manpower required.
2. More protective.
3. Accidents are avoided.
4. Automatic moisture maintained.
5. Simple circuit.
6. Simple operation.

CONCLUSION :

In this project we can maintain the continuity of earthing without any interruption with the help of controlling circuit. We can protect the machines or humans from over current from damage and accidents. Also we can bring automation in earthing system.