Power Grid Failure Detection Using Voltage And Frequency Variance Using IOT

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ABSTRACT

An electric network, electric grid, or electricity network is an integrated electricity supply network for producers to consumers. It consists of electricity producing stations. The main objective of this study is to monitor the electricity grid system process, disclose this system at a dangerous level, monitor the current line, and reduce conventional systems expenses. From anywhere on the Internet, we can monitor. We can do it also if a system is enabled or disabled. It uses an electrical microcontroller to monitor a single-phase electrical device using Arduino to read sensor voltage and current and then communicate measured data via a new Android application for wireless monitoring. It enables the monitoring of several basic power quality parameters of basic voltage. The technology also determines the line frequency and power factor.

Keyword : - Arduino Uno , power grid, android app, sensor, voltage and current, internet of things, etc

1.INTRODUCTION

The population of the earth will reach 9.9 billion people by 2050, according to a report by the Population Reference Bureau. As people move to more populated areas, cities face the challenges of providing enough power for everyone while using outdated power grids. Current electric grids — built mainly in the 1890s — are overburdened and inefficient. One fallen tree branch can cause blackouts in entire areas for hours. Congested roadways and increased emissions continue to impact the health and happiness of people worldwide.

The Internet of Things (IoT) has the power to reshape the way we think about cities across the world. IoT connects people and governments to smart city solutions. Connecting and controlling devices has given rise to smart grid technology, designed to improve and replace older architecture.

IOT sensible Energy Grid is predicated on ATmega family controller that controls the assorted activities of the system. The system communicates over net by victimization Wi-Fi technology. A bulb is employed during this

project to demonstrate as a sound client associated a bulb to demonstrate an invalid client. The foremost factor that this project facilitates is re-connection of cable to active grid. If associate Energy Grid becomes faulty associated there's an another Energy Grid, the system switches the

Transmission Lines towards this Grid so facilitating uninterrupted electricity provide thereto explicit region whose Energy Grid went OFF. And this data of that Grid is active is updated over IOT webpage wherever the authorities will login and might read the updates. Except for observation the Grid this project has advances capabilities of observation energy consumption and even find thieving of electricity. The quantity of electricity consumed and also the calculable value of the usage gets updated on the IOT webpage in conjunction with the Energy Grid data.

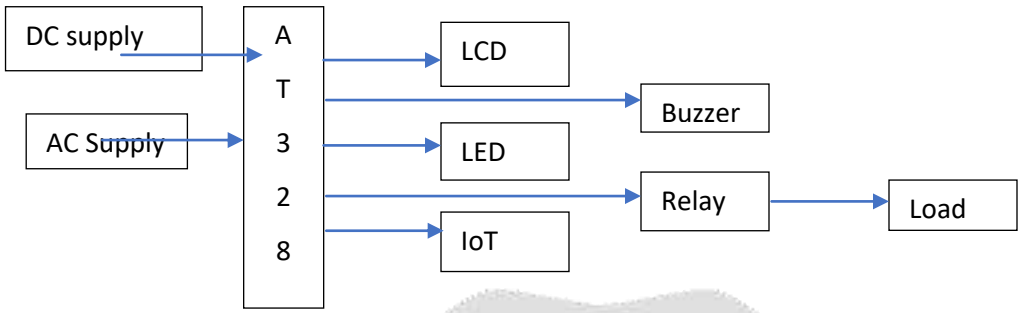
Line fault conditions are simulated within the system victimization 2 switches. Switch one when can simulate a thieving condition and conjointly can advise the authorities over the IOT interface. During this manner the sensible Energy Grid project makes positive that the electricity provide is continuous and helps in maintaining a updated record of consumption and thieving data that is kind of a valuable data for the energy manufacturing corporations.

The Smart Grid (SG), the intelligent power grid, could be seen as the largest instantiation of the IoT network in the next future. The whole power grid chain, from the energy power plant generation to the final electricity consumers (houses, building, factories, public lightning, electric vehicles, smart appliances, etc.), including transmission and distribution power networks, will be filled with intelligence and two-way communication capabilities to monitor and control the power grid anywhere, at a fine granularity and a high accuracy. For instance, smart houses, will be equipped with smart meters and smart appliances, whereas power generators and electric transmission and distribution networks will be equipped with various sensors and actuators. The aim of the SG is to keep a real-time balance between energy generation and consumption, by allowing a fine-grained monitoring and control over the power chain, thanks to the huge number of the two-way communicating smart objects (smart meters, smart appliances, sensors, actuators, etc.)

2.PROBLEM STATEMENT

In most countries, business power is formed offered via nationwide grid, interconnecting various generating stations to load. the standard strategies that area unit in use these days like SMS area unit pricey. Since IOT is price effective due to net compared to SMS, observance and dominant of energy usage at lower price is formed attainable. Daily consumption reports area unit generated which may be monitored by user through internet page and/or web portal.

3. BLOCK DIAGRAM



4.WORKING PRINCIPLE

Firstly, we turn on single phase 230v ,50hz AC supply. But various parts of our project work on 12 v by 5v dc supply that why we use 230/12v dc charger the microcontroller of 8051 family requires high volt input for their operation. We use voltage regulate that is potentiometer by using voltage regulator v regulate supply 12 v into 5 volt for operation of microcontroller.

The microcontroller is interfaced with LCD display relay drive, voltage detector, current, detector IOT module, LED, buzzer, and load. Then we vary voltage by using voltage regulator and variable frequency by using IC555.

The voltage and frequency detector sensed the any abnormalities in the supply through reference value and this sensed data analysis by microcontroller to generate output signal to other device and perform tripping action through relay driver according to the higher or lower value of voltage or frequency.

The lamp is used to indicate the synchronization failure of the supply. This failure of the supply is detector by the relay. And thew relay is send signal to the microcontroller, then microcontroller send tripping signal to the relay then relay disconnect the load from the supply. Thus we protect electrical equipment's from the faulty section.

5. CONCLUSION

In this project the idea of IOT for fault detection, monitoring, controlling of 3 phase load. The system has the flexibility to mix numerous perceived parameters in real time and improve correct detection of different faults occur in load aspect. The observance of the lamp load system presents the activity of different parameters specifically power issue, offer voltage and cur-rent, frequency, real powers, reactive power, apparent power. Thus, compared to alternative typical ways this technique has additional variety of fields that allows alarm, alert messages and fast dominant. The conception of IOT is given here for remote observance and dominant the hundreds. the info is additionally displayed serially. the appliance of the system is required these days for each electrical system. The system has the precise advantage less maintenance, simple and fast dominant and accessing of knowledge remotely. Experimental results make sure the practicability of the implementation of the system.

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