MONITORING AND CONTROLLING OF CONTINGENCIES IN SMART GRID USING INTERNET OF THINGS

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I. ABSTRACT

Smart grid is the latest trend of development and reform in today's world, and it is also a major technological innovation and development trend in the 21st century. Internet of Things technology is a new information processing and acquisition method, and it has been widely used in smart grids environmental monitoring and other fields. Internet of Things is an important technical mean to promote the development of smart grid.

Utilizing Internet of Things (IoT) technology in smart grid is an important approach to speed up the information of power grid system, and it is beneficial for effective management of the power grid infrastructure. Prevention fluctuation is one of the most important application fields of IoT. Advanced sensing and communication technologies of IoT can effectively avoid or reduce the damage of the devices, improve the reliability of supply line and reduce economic loss. Focused on the characteristic of the construction and development of smart grid, this paper introduced the application of IoT in online monitoring system of supply line parameters. In this system we are using current sensor and voltage sensor to measure supply line parameters. According to the supply line condition device will be control.

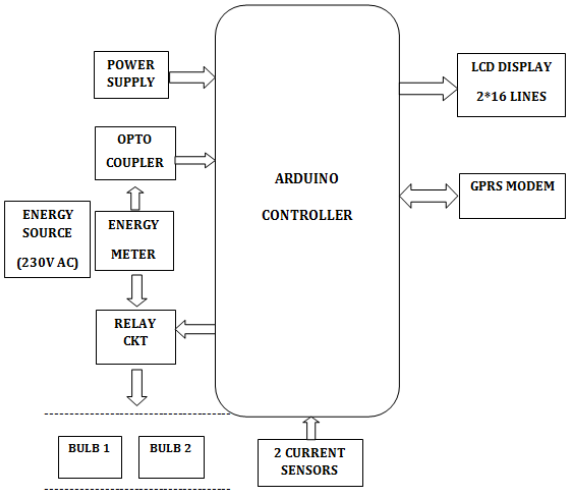
Keywords: Microcontroller, GPRS, Current & Voltage sensors etc.

II. INTRODUCTION

This paper proposes a framework for contingency management using smart loads, which are realized through the emerging paradigm of the Internet of things. The framework involves the system operator, the load serving entities (LSEs), and the end-users with smart home management systems that automatically control devices. The system operator uses an efficient linear equation solver to quickly calculate the load curtailment needed at each device to relieve congested lines after a contingency.

This system principally monitors electrical parameters of household appliances such as voltage and current and subsequently calculates the power consumed. As WSN's are having many advantages, here we have designed smart meters predicting the usage of power consumption. However it is low-cost, flexible, and robust system to continuously monitor and control based on consumer requirements, GPRS technology for networking and communication, because it has low-power characteristics, which enable it to be widely used in home and building environments.

III. BLOCK DIAGRAM



Fig(3.1) System Block Diagram

SYSTEM OVERVIEW:

Power Supply: This section is meant for supplying Power to all the sections mentioned above. It basically consists of a Transformer to step down the 230V ac to 9V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification the obtained rippled dc is filtered using a capacitor Filter. A positive voltage regulator is used to regulate the obtained dc voltage.

Microcontroller: Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

LCD Display: This section is basically meant to show up the status of the project. This project makes use of Liquid Crystal Display to display / prompt for necessary information. The LCD is an Alphanumeric Display it means that it can display Alphabets, Numbers as well as special symbols thus LCD is a user friendly Display device which can be used for displaying various messages unlike seven segment display which

can display only numbers and some of the alphabets. The only disadvantage of LCD over seven segment is that seven segment is robust display and be visualized from a longer distance as compared to LCD. Here we have used 16 x 2 Alphanumeric Display which means on this display we can display two lines with maximum of 16 characters in one line.

Relay Section: This section consists of an interfacing circuitry to switch ON / OFF the system whenever any unhealthy conditions i.e. overload is detected. This circuitry basically consists of a Relay, transistor and a protection diode. A relay is used to drive the 230V devices.

Optocoupler: Where small size, higher speed and greater reliability are important, a much better alternative is to use an Optocoupler. These use a beam of light to transmit the signals or data across an electrical barrier, and achieve excellent isolation. Optocoupler typically come in a small 6-pin or 8-pin IC package, but are essentially a combination of two distinct devices.

Energy meter: An electricity meter or energy meter is a device that measures the amount of electric energy consumed by a residence, business, or an electrically powered device. Electricity meters are typically calibrated in billing units, the most common one being the kilowatt hour. Periodic readings of electric meters establish billing cycles and energy used during a cycle.

GPRS Module: GSM/GPRS Modules are one of the commonly used communication modules in embedded systems. A GSM GPRS Module is used to enable communication between a microcontroller and the GSM / GPSR Network. Here, GSM stands for Global System for Mobile Communication and GPRS stands for General Packet Radio Service. GSM / GPRS Modules allow microcontrollers to have a wireless communication with other devices and instruments. Such wireless connectivity of microcontroller opens up to wide range of applications like Home Automation, Home Security Systems.

IV. CONCLUSION

We have presented architecture, an implementation, and a demonstration of the Customer Domain of the smart grid, based on a platform for the IoT that can host a broad range of smart home applications. Hence, by implementing this project it is easy for monitoring and controlling the power, towards the implementation of an intelligent building.

V. REFERENCES

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