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WIRELESS AC LINE DETECTOR

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ABSTRACT

In Industries accident takes place due to leakage of electricity. The accidents can be avoided by using the wireless AC line detector. The motive of this project is to detect presence of electricity wirelessly. The detection takes place continuously which can be monitored by using a mobile.The monitoring may be using stand alone application and Personal Computer. Two main components are current sensor and voltage sensor are used in ac lines. Using the transformer step down takes place. The voltage sensor senses the amount of voltage in the line. Then the readings are given to the arduino. The arduino converts the analog signal into digital signal. In a similar way the current sensor senses the current value and gives it to the arduino board. The arduino converts the analog signal into digital signal. The arduino board then sends the data to mobiles and web pages using GSM modules and Wi-Fi module respectively.

Keywords— Arduino; GSM Module; Wi-Fi Module; Current Sensor ; Voltage Sensor.

I.INTRODUCTION

In electronics, leakage may refer to a gradual loss of energy from a charged capacitor. It is primarily caused by electronic devices attached to the capacitors, such as transistors or diodes, which conduct a small amount of current even when they are turned off. Even though this off current is an order of magnitude less than the current through the device when it is on, the current still slowly discharges the capacitor. Another contributor to leakage from a capacitor is from the undesired imperfection of some dielectric materials used in capacitors, also known as dielectric leakage. It is a result of the dielectric material not being a perfect insulator and having some non-zero conductivity, allowing a leakage current to flow, slowly discharging the capacitor.

The leakage can be detected by using a Wireless AC line detector which will help to prevent accidents. In our project we detect and monitor the voltage and current. In Industries accident takes place due to leakage of electricity. The accidents can be avoided by using the wireless AC line detector. The motive of this project is to detect presence of electricity wirelessly. The detection takes place continuously which can be monitored by using a mobile.

The monitoring may be using stand alone application and Personal Computer. Two main components are currentsensor and voltage sensor are used in ac lines. Using the transformer step down takes place. The voltage sensor senses the amount of voltage in the line. Then the readings are given to the Arduino. The Arduino converts the analog signal into digital signal. In a similar way the current sensor senses the current value and gives it to the arduino board. The arduino converts the analog signal into digital signal. The arduino board then sends the data to mobiles and web pages using GSM modules and Wi-Fi module respectively.

The objective of this project is to reduce accident due to leakage current and voltage. It also facilitates continuous monitoring of AC lines in industries and commercial buildings so that the user gets timely alert of variations in voltage or current. The main objective is to alert the user who is in a remote location so that major issues in the AC lines can be detected and accidents can be prevented. The alert is given as normal text message as well as in app. A web page is also created to display the values. The remote user can now act accordingly. In addition the project aims to detect any theft in AC lines which supports the Electricity board to track any illegal usage and help officials to take stringent actions against the criminals.

II.LITERATURE SURVEY

The Long-Run Efficiency of Real-Time Electricity Pricing proposed by Severin Borenstein Retail real-time pricing (RTP) of electricity – retail pricing that changes hourly to reflect the changing supply/demand balance – is very appealing to economists because it "sends the right price signals." Economic efficiency gains from RTP, however, are often confused with the short-term wealth transfers from producers to consumers that RTP can create. Abstracting from transfers, I focus on the long-run efficiency gains from adopting RTP in a competitive electricity market. Using simple simulations with realistic parameters, I demonstrate that the magnitude of efficiency gains from RTP is likely to be significant even if demand shows very little elasticity. I also show that "time-of-use" pricing, a simple peak and off-peak pricing system, is likely to capture a very small share of the efficiency gains that RTP offers.

Vinayak Sonandkar et.al. has proposed that the power demand has increased drastically over the last few years. One of the way by which we can solve this energy problems is by reducing usage of energy in households during peak demand. For this, demand response by real time pricing is implemented in the project. There is need for accurate and economic methods of power measurement. The main objective of this project is Power Measurement to reduce peak on generation by providing customers with their instantaneous power consumption. The aim of providing such data to the user is, to encourage them to shift their load during non-peak hour and reduce their power usage and electricity bill. Hardware, Software and the theory involved in the project is briefly described . The current and voltage signals from the load are stepped down and conditioned before they are given to the Atmega328. Load circuit, Signal conditioning circuit and their construction and functionality in the project are discussed.

ARDUINO

Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

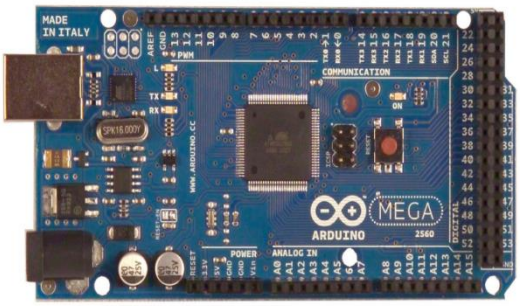

Figure 1: Arduino Diagram

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it is growing through the contributions of users worldwide.Thanks to its simple and accessible user experience, Arduino has been used in thousands of different projects

and applications. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build low cost scientific instruments, to prove chemistry and physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example. Arduino is a key tool to learn new things. Anyone - children, hobbyists, artists, programmers - can start tinkering just following the step by step instructions of a kit, or sharing ideas online with other members of the Arduino community.

ATMEGA328

The AVR is a modified Harvard architecture 8-bit RISC single-chip microcontroller, which was developed by Atmel in 1996. The AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as opposed to one-time programmable ROM,EPROM, or EEPROM used by other microcontrollers at the time.The AVR architecture was conceived by two students at the Norwegian Institute of Technology (NTH), Alf-Egil Bogen and Vegard Wollan.

The original AVR MCU was developed at a local ASIC house in Trondheim, Norway, called Nordic VLSI at the time, now Nordic Semiconductor, where Bogen and Wollan were working as students. It was known as a µRISC (Micro RISC) and was available as silicon IP/building block from Nordic VLSI. When the technology was sold to Atmel from Nordic VLSI, the internal architecture was further developed by Bogen and Wollan at Atmel Norway, a subsidiary of Atmel. The designers worked closely with compiler writers at IAR Systems to ensure that the instruction set provided for more efficient compilation of high-level languages. Atmel says that the name AVR is not an acronym and does not stand for anything in particular. The creators of the AVR give no definitive answer as to what the term "AVR" stands for. However, it is commonly accepted that AVR stands for Alf (Egil Bogen) and Vegard (Wollan)'s RISC processor. Note that the use of "AVR" in this article generally refers to the 8-bit RISC line of Atmel AVR Microcontrollers.

IV. CONCLUSION

In this paper, we have proposed a paper on wireless AC line for preventing the leakage of power and theft of current. It is a very useful project for industrial power usage .In future, it could be extended even more for better efficiency.

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