

## Device For Monitoring Consumption Of Electricity

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**Abstract:** Universal current monitoring system is new generation project based on the micro controller which is used to measure current. This gadget measures the current consuming by all the electric devices. This project is mainly helpful for uneducated and even educated people. This is mainly used to monitor the current consumed by the every electric gadget. At the same time the user can also monitor the current consuming values in the display which will be in the device and also in the mobile screen. In order to record all the data we can use the database or the user can manage with mobile. In order to check continuous electricity consumption, monitoring and displaying we are using the micro controller. The micro controller is central part to get the data from the all sensors and monitoring the data depending on the user condition. The user can operate this gadget by using smart mobile phone

**Keywords:** Arduino-Uno, ACS712, LCD, Buzzer, DBMS, PHP etc.

### 1. Introduction

In the present days electricity plays a main role. Everything or every work is related to electricity without electricity no electric device will work. Even now all the mechanical devices are converted to electric devices. Our lives will not go forward without electricity. That means all the electricity will consume the power but in the different volume. The main problem is human being's don't know how to calculate the power consuming by the specific electric device at present. Even the electric meters present in our home which can measure the

electricity but the person standing in front of meter cannot calculate the current consumed per second. If it is the case of educated people they can calculate current bill but not present consumption of electricity.

When we come's to the uneducated people they can't find anything exact units. There is no problem with above negative cases until and unless the power drought. Because at present there is no power drought and the electricity is surplus. But in the future the power there will be a power draught. Then the unit rate of electricity will be increased and the restriction will be used so the device will be used there simply we can tell this device is the updated version of multi meter. The multi meter can measure the current but it is heavily risk. So the problem will be with current shock. When then current shock attacks the human nerves are affected by an electric shock, the consequences include pain, tingling, numbness, weakness or difficulty moving a limb Electric injury can also affect the central

nervous system. When a shock occurs, the victim may be dazed or may experience amnesia, seizure or respiratory arrest.

### 2. Realted Works

At present, he is filling in as Assistant Professor at the Department of Electrical. Building in He has distributed in excess of 20 research papers in

worldwide Extensive conversations on electronic estimation frameworks and related. Knowledge of the voltage situated at the terminal of each circuit component just as the present streaming in every component gives full data on the circuit conduct. The estimation of voltages and flows is

Subsequently of most extreme significance to estimating frameworks. This article gives the essential hypothesis and practice expected to see how electric flow is estimated and institutionalized.

The ACS712 IC is a direct present sensor utilized for estimating AC and DC flows. This gadget comes in three kinds from the maker as per the greatest current detected ( $\pm 5$ ,  $\pm 20$ , and  $\pm 30$  A). Right now, ACS712-30A was utilized as the flow sensor. lately, the interest for power has expanded in family units with the utilization of various machines. This raises a worry to many created and creating countries with the interest in prompt increment of power. There is a requirement for shoppers or individuals to follow their everyday power use in houses. In Sweden, shortage of vitality assets is looked during the day. In this way, the obligation of human to spare and control these assets is additionally significant. This examination work centers around a Smart Metering

information for disseminating the power astutely and proficiently to the shoppers. The fundamental disadvantage of recently utilized conventional meters is that they don't give data to the purchasers, which is practiced with the assistance of Smart Meter. A Smart Meter encourages shopper to know the data of utilization of power for machines in their separate houses. The point of this exploration work is to quantify and dissect power utilization utilizing Smart Meter information by leading contextual analysis on different family units. Furthermore of sparing power, Smart Meter information shows the conduct of purchasers in utilizing gadgets. As force utilization is expanding step by step there ought to be more spotlight on understanding utilization designs for example estimation and examination of utilization after some time is required. If there should be an occurrence of creating countries, the innovation of utilizing brilliant power meters is as yet uninformed to numerous ordinary citizens and power utilities. In this way, there is a huge need for sparing vitality by introducing these meters. Bringing down the vitality consumption by understanding the conduct

of customers and its relationship with power spot costs spurred to play out this examination.

The approach followed to investigate the result of this examination is displayed with the assistance of a case examination, ARIMA model utilizing XLSTAT instrument and a leveling system. In view of value assessment results gave in the exploration, speculation is accomplished change the conduct of purchasers when they have better control on their propensities. This examination contributes in estimating the Smart Meter power utilization information in different families and translation of the information for hourly estimation could make buyers change utilization to off-top periods. With the outcomes gave right now, can change their conduct when they have better control on their habits.

### 3. Literature Review

At present the people were using the multi meters to measure the high voltage electricity and for even battery purpose application. In the real life we are keeping restriction for our hotspot because its limited and high cost but there is no problem with electricity now a day. The problem will arise when the electricity is less. The application they should use to restrict the electricity and even to calculate rate. The people who are standing in front of electric meters can't identify at present how much current is consuming and they can calculate the rate with the previous units and the person who is calculating the current bill should know the knowledge so the main problem for educated people and uneducated people facing to calculate the present consuming electricity. The people don't know how much electricity they were using in day to day life. So in this case the people cannot catch multi meter all the time because its 240v electricity and its very danger. Here the human lives are in risk.

### 4. Objective

The main objective of this project is to create a

device that can measure the voltage and current. This is the device where we can measure the current and voltage without any risk. This is the system which can help uneducated and even educated people to measure the current per particular second. This is very useful to the human being's to the work without any risk. This is the one device can be used for the various application to measure the current. This system easily monitor's the current and voltage passing through. When here is a lack of current we can use this application. It is very hard to do the work all the time with millimeter for the simple and complex application. This device can be used in the all fields such as restrict the current in the hotels rooms, battery charging points etc.

### 5. Proposed System

Here we are building a device, which is very compactable. It can easily transfer the data to the database and the process as follows.

Initially when the user starts the application it will take 2-3 seconds to start the system and later it will take all the values from current sensor and voltage sensor at the same time it will calculate the current taken by the device and subtracts from the final voltage then it displays the message i.e., can connect device now the user can connect the device from thus phase continuously the voltage and current sensor values. This voltage and current sensed values will be sending to microcontroller. Here the processing takes place then it will display the results on the LCD. So this device is very safe to measure the electricity in all the fields. This is the one device used for the n number of applications we can measure battery voltage also so we can find current used by particular device that can consume 240V AC, Dc, low voltage DC power. So if we consider the applications of this device, wherever we are using multi meters or electric meters and remaining we can replace it by universal current measuring system and remaining applications are as follows:

Advantages:-

The person who is not educated about the current consuming process will also be able to understand each and everything which will display on the LCD. The one can know how much current is consuming at that instant, how much current is consumed until that time and even the rate of consumed current.

In future all the petrol and diesel bikes and cars are transformed to current or battery driven vehicles due to air pollution. So all the petrol stations will be converted to battery charging stations. Initially batteries will be fully charged for rent, so the battery stations may get loss if customer batteries are not in good condition as it drives off more current.

Another application is regarding the current management in hotel rooms, casually in hotels they don't have any idea about how much current the user is consuming in rooms. So this device gives solution for this, every room will be having this device get connected and that will calculate the total current consumed by user and accordingly the bill will be generated.

To measure the current in the different types of battery we can make use of this device which will give the accurate results. Not only the above mentioned uses this also includes much more applications wherever the current measuring is important and needed.

## 6. Methodology

As soon as any electrical appliance is connected to the system and the AC power supply is switched on, the alternating current is given to the AC to DC converter which converts alternating current to direct current which later on is supplied as input for the micro controller i.e. Arduino-Uno.

The alternating supply current is also given to the relay which will act as a switch for the user input from the operational platform (Website). The alternating current is also supplied as an input for the current sensor i.e. ACS712. Based on the input

value of the user the Arduino will generate for input for the relay which will either switch on or off the electric appliance. If the appliance is switched on then the micro controller will also send an input signal to the current sensor which will measure the value of current flowing through that particular appliance per second and on the bases of various mathematical formulae's and algorithm we will calculate the amount of power consumed by the appliance which will later be used to find the bill amount.

All the above mentioned values will also be displayed on the 16\*2 LCD module. We also have a buzzer which will alarm the user when consumption of the power is more than what is being expected by the user. We also have an Arduino Ethernet shield which provides Internet connectivity to our prototype so that the system can be controlled from any part of the world provided a stable internet connection is provided through a modem/router.

When we look in depth of the working of the algorithms behind the projects we have used technologies like PHP, DBMS and JAVA SCRIPT LIBRARIES.

We used Hypertext preprocessing to establish a successful connection between our system's front end and back end engineering. For fetching the real time values and storing it in an efficient manner i.e. using rows and columns. For validation and verification of the user as well as the admin we used java script libraries so that we will have a link between various webpage.

## 7. Proposed Algorithm

ALGORITHM CURRENT MEASURE:- WHILE (TRUE)

Measuring the current Calling\_to\_the\_display\_function(); calculating the joules and wattes  
Calling\_to\_the\_display\_function(); Calculating the Price; Calling\_to\_the\_display\_function();

Sending the data to Data base via medium as internet;

### 8. Results

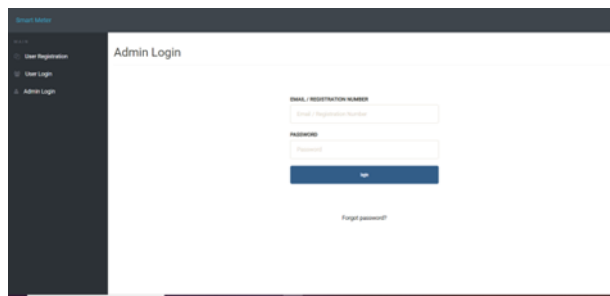


Fig 8.1 Admin Login



Fig 8.2:- Dashboard of admin

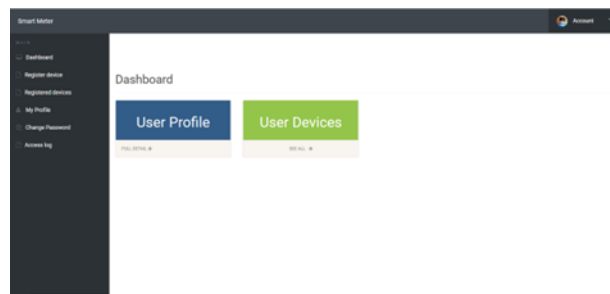


Fig 8.3:- Dashboard of user and accessed by admin

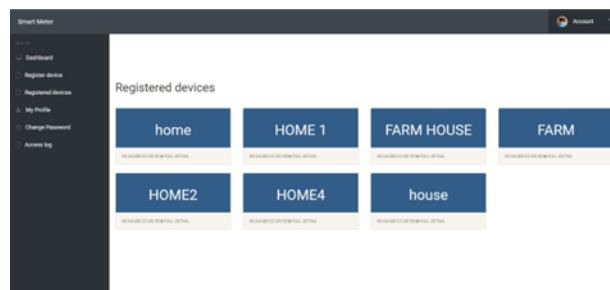


Fig 8.4:- Registered devices

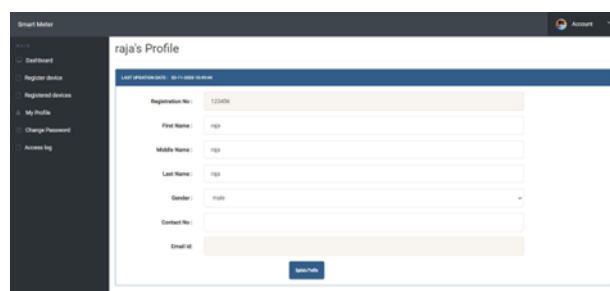


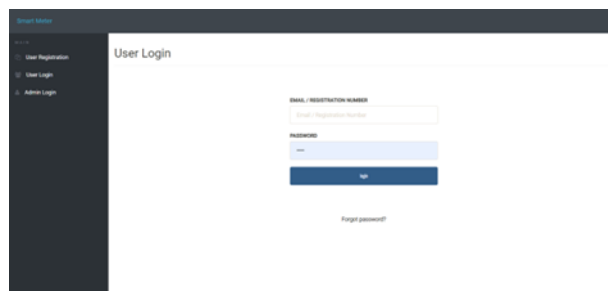
Fig 8.5:- profile page of the user



**Fig 8.6:-** Live data and controls page



**Fig 8.7:-** Electricity bill Generation



**Fig 8.8:-** User login

Caption:- This device has not been included in the results due to security concerns .

**9. Conclusion And Future Enhancement**

**Conclusion:-**

This Universal current monitoring system provides an safety environment to measure the current. So the people will feel very interested, user friendly and reliable to use this device because of safety and accuracy. One device can help in wide applications where current plays an important role. An uneducated people can feel better to use this device and there are n number of safety measures for user as it is totally plug system based device and no one get affected by the current and the main application of this device is charging batteries for the battery stations. So it can reduce the current shock because of 3-pin plug system. Even this three pin plug made this device to use easily.

**Future Enhancement:-**

- We can add so many features in this device like as follows
- We can use Bluetooth device to see the live current consumption values, storage and process as per requirement even if you are inside the home with respect to electric meters in home.
- We can create an database and we can load all the information in it so that the user can see how much current is consumed and this can be implemented in the APK file.
- This is the wide application where this device plays the main role i.e., the government makes a digital money or demonetization maintain the transactions list. Here by using this device the government can directly switch on/off the electric meters accordingly with respect to current, wattage and rate.

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