

# IoT using Smart Energy Meter for Home

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**ABSTRACT-** This paper is portrayed to gauge vitality utilization in the house and produce its bill consequently utilizing IOT correspondence. This can help in decreasing vitality utilization in house as the proprietor is consistently being informed about the quantity of units that are devoured. Its objective is to create bill naturally by checking the power unit's utilization in a house and in an approach to decrease the difficult work. The figuring's are performed consequently and the bill is refreshed on the web by utilizing a system of Internet of Things. The bill sum can be checked by the proprietor anyplace all inclusive. Structure and execution of task is for the most part dependent on Node MCU controller utilizing IOT idea. In power transmission human association isn't required. Purchaser pays the power bill for the expended power. On the off chance that on the off chance that buyer neglects to pay the bill on time, power transmission can consequently be killed. Likewise control burglary can be identified if any altering happens it will send the data to the server just as it will cut the power naturally. WIFI plays out the IOT task where and through which the data is sent to the Web server.

**Keywords:** - Energy meter, IoT

## 1. INTRODUCTION

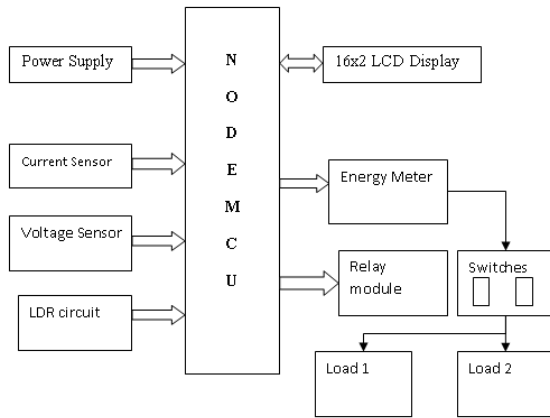
The web of thing enables item to be detected and controlled remotely crosswise over existing system framework, making open doors for more straightforward coordination between the physical world and PC based frameworks, and bringing about enhanced proficiency, precision and monetary advantage. The expanding age needs engaged devices by remote innovation which incorporates Bluetooth, Radio Frequency Identification, Embedded sensors and some more. In that IOT innovation has developed from its start and now directly generally utilizing it. The power assumes an imperative job in our life. Presently a-days as the buyers are expanding quickly it turned out to be difficult to deal with the power necessities. Without power it's difficult to endure and furthermore it is imperative to spare the power

misfortune. As the age is builds the purchaser's necessities likewise expanding so as per it the innovation enhancement is required. So we built up the framework with quicker and enhanced innovation for example IOT. The power additionally contains a few issues like power robbery. Power burglary is a measure wrongdoing and it additionally specifically influences the economy of our nation. Transmission, age and dispersion of power incorporate the loss of power. To maintain a strategic distance from the misfortunes we have to screen the influence utilization and misfortunes, so we can productively use the created influence. Meter hardening is a piece of intensity burglary and furthermore unlawful wrongdoing which we can limit. Charging is a procedure as a rule the human administrator goes to each shopper's home at that point giving charge it will require parcel of investment. To determine these issues we created framework on the base of IOT vitality meter perusing. IOT based vitality meter perusing comprises of three sections: Controller, Theft discovery and WIFI part. Controller part assumes a noteworthy job in the framework. Where all the data can send through this controller to the next piece of the framework and it likewise stores the data in it. WIFI part performs IOT activity as per the Arduino controller. The vitality meter associated with robbery recognition part if any temper happens it will send the data to the organization just as it will make programmed move by making power off.

## II. EXISTING METHOD

The present system only provides feedback to the customer at the end of the month that how much power is consumed in the form of bill. The consumer has no way to track their energy usage on a more immediate basis. The consumers are growing exponentially fast and load on power providing divisions is rapidly rising. In the existing system meter tampering can be done easily and it's one of the major drawbacks for an energy crisis.

### III. PROPOSED METHOD



**Fig1: Block diagram**

The proposed conceptual system in this work is to monitor the state of a Energy meter system through an IoT based network in order to control it remotely. The information from the sensors is transmitted via the mobile radio network

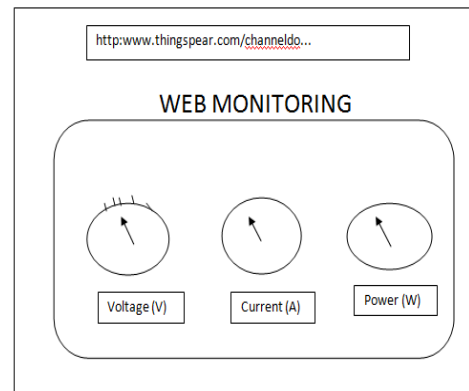
Components used are

- 1) Node MCU Microcontroller
- 2) Current Sensor
- 3) LDR Circuit
- 4) IOT
- 5) LCD Display
- 6) Power supply
- 7) Relay module
- 8) Energy meter
- 9) Switches

Platform and Language Used

- 1) PTC's Thing Worx's IoT platform for M2M Services
- 2) Ubidots

An independent web facilitating administration running on the objective PC gives an office to monitor[12] the live information from anyplace on the planet if having a web association. Log information document might be specifically gotten to or the information in the log records might be seen at UI website page. As a matter of course, port 80 is utilized for web server. A HTTP ask for will come to target PC through port 80 for showing website page. Website page assets ought to be customized to 'auto revive' of information showing segment of site page at a settled interim.



**Figure 2: Web monitoring**

#### CURRENT SENSOR

A flow sensor is a gadget that identifies electric flow in a wire, and produces a flag corresponding to that flow. The produced flag could be simple voltage or present or even an advanced yield. The created flag can be then used to show the deliberate current in an ammeter, or can be put away for further investigation in an information obtaining framework, or can be utilized with the end goal of control.

The detected current and the yield flag can be:

- Direct current information,
  - unipolar, with a unipolar yield, which copies the wave state of the detected current
  - digital yield, which switches when the detected current surpasses a specific limit



**Figure 3: Current Sensor**

#### VOLTAGE SENSOR

A voltage sensor will be ready to decide and even screen and measure the voltage supply. It is then ready to take those estimations and transform them into a flag that one will at that point have the capacity to peruse. The flag will regularly go into a particular electronic gadget for chronicle, yet here and there, an

eyewitness will be available to physically peruse the sensor yield.

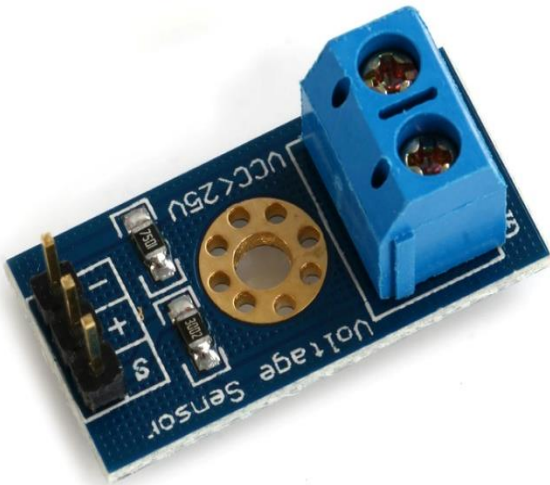


Figure 5: Voltage sensor

**ENERGY METER**

The regular mechanical vitality meter depends on the wonder of "Attractive Induction". It has a pivoting aluminum Wheel called Ferriwheel and numerous toothed wheels. In light of the stream of current, the Ferriwheel pivots which makes revolution of different wheels. This will be changed over into comparing estimations in the presentation segment.

**RELAY MODULE**

We can control High Voltage electronic gadgets utilizing transfers. A Relay is really a switch which is electrically worked by an electromagnet. The electromagnet is initiated with a low voltage, for instance 5 volts from a microcontroller and it pulls a contact to represent the deciding moment a high voltage circuit.

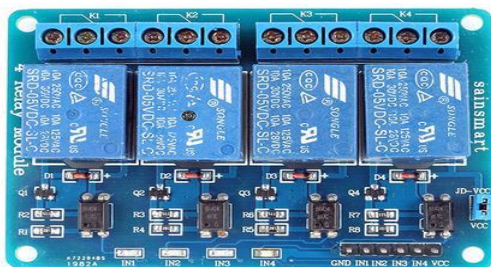


Figure 6: Relay Module

**ARDUINO UNO**

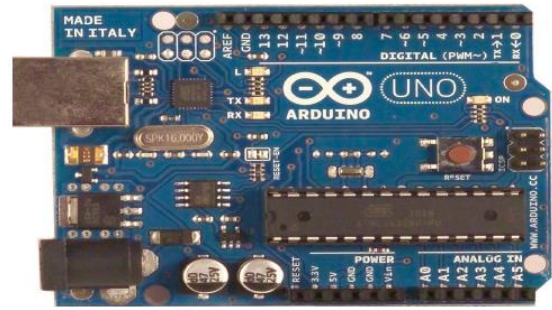


Figure 7: Arduino Uno

Arduino is a microcontroller board and it depends on ATmega328P. Board comprises of 14 advanced information/yield pins. Out of which 6 input pins are utilized as PWM yields, 6 as simple sources of info, quartz gem of 16MHz, having USB association, control supply snap, an ICSP header and reset catch. Just we can associate the Arduino board to the PC utilizing USB association with get begins. Likewise we can supply capacity to it with AC – to – DC connector or we can utilize battery to begin. As we contrast Arduino UNO board and other it varies from the procedure board which doesn't utilize FTDI USB – to – sequential driver chip. Rather than that the ATmega8U2 is modified as USB – to – sequential converter.

**IV. CONCLUSION**

"The IOT based Energy meter" spares the client's time by making them work "less fatty". The activity of the figuring the power cost is straightforward and doesn't include delays. Rather than utilizing DAQ which is expensive in this venture Node MCU microcontroller alongside sequential correspondence has been utilized to interface with the virtual terminal [5]. The IOT based Energy meter for ascertaining cost and showed in LCD. This task can subsequently edify the executives about sat around idly, and superfluous excursions, accounting and charging on the grounds that it gives a precise bookkeeping of units driven in light of the fact that the anticipation of negligence. Henceforth it lessens the wastage of vitality and bring mindfulness among all. Indeed, even it will deduct the manual intercession.

**FUTURE SCOPE**

Converting this system to home automation will prove an emerging benefit to IoT technology. Using this technology in smart grid can provide more efficient power supply and power saving .IoT technology coupled with smart meters and smart devices can help in the upbringing the cities into smarter and developed cities.

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