

IoT Based Ingenious Vitality Meter with GSM Benefits

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Abstract— It is a practice from many years we have seen a person from electricity board coming to home by home and area by area by taking the readings from the energy meter and handover the bill to the consumers every month .Many times the disadvantages like extra bill amount, manual errors, it’s also a time consuming process, the notification from the electricity board even after the bills are paid. To eradicate these drawbacks of conventional energy meter, smart energy meter is introduced which will help in many features like automatic and superior metering and billing system. Smart energy meter is IoT based with SMS service. The main purpose of smart energy meter is to incorporate with the embedded controller and use GSM module with IoT to transmit the data it is measure in turns of KHz. Data acquisition, time saving and the consumer will be having consumption details.

Keywords: GSM Module, IoT, LCD

I. INTRODUCTION

An electricity meter, electric meter, electrical meter, or energy meter is a device that measures the amount of electric energy consumed by the residence, a business, or an electrically powered device. Electric utilities use electric meters installed at customer’s premises to measure electric energy delivered to their consumers for billing purposes. They are typically calibrated in billing units, the most common one being the kilo watt hour(kHz). They are usually red once each billing period, which is equal to the amount of energy used by a load of 1kw over a period of one hour, or 3,600,000 joules. some electricity companies use the SI mega joule instead. Demand is normally measured in watts, but averaged over a period, most often a quarter or half hour. Reactive power is measured in thousands of volt amperes reactive hours (knar). By convention, a “lagging” or inductive load, such as a motor, will have positive reactive power. A “leading”, or capacitive load, will have negative reactive power volt amperes measures all power passed through a distribution network, including reactive and actual this is equal to the product of root-mean-square volts and amperes. Electric utilities use electric meters installed at customer’s premises to measure electric energy delivered to their customers for billing purposes. Electricity meter operate by continuously measuring the instantaneous voltage and current to give energy used in joules, KHz etc.

II. CONSTRUCTION &WORKING

A. Block Diagram

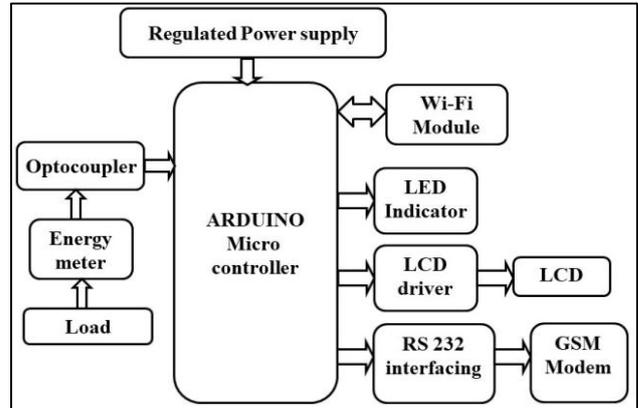


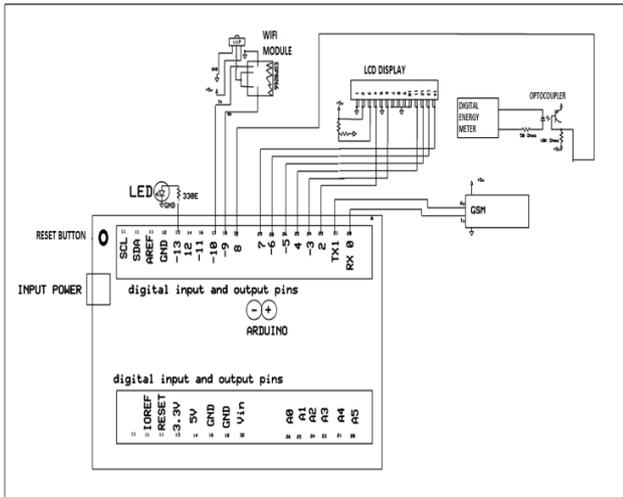
Fig. 1: Block diagram of the System

The project is Iota based smart energy meter shows the problem faced by both consumer and distribution companies. This project is mainly deals with the smart energy meter, which utilizes the features of embedded system that is combination of hardware and software in order to implement desired functionality. This project includes comparison of Adriano and other controllers and applications of GSM WI-FI modem to introduce smart concept. With the use of GSM modem the consumer as well as service provider will get the used energy reading with respective amount. Consumer will get notification in the form text through GSM when they are about to reach their threshold value.

B. List of Components with Specifications

Serial #	Name of the Component	Specification	Number Required
1	Regulated power supply		1
2	Energy meter	Single or three phase	1
3	Opt coupler	4N35 Optocoupler	1
4	Arduino UNO	Arduino ATMEGA328	1
5	RS 232		1
6	GSM module		1
7	Wi-Fi module	ESP8266	1

Table 1: Table Containing List of Components with Their Specifications.



C. Circuit Diagram of the Adriano based Quad copter Drone

The picture shown in Figure 3. Shows the assembly of the project's prototype.

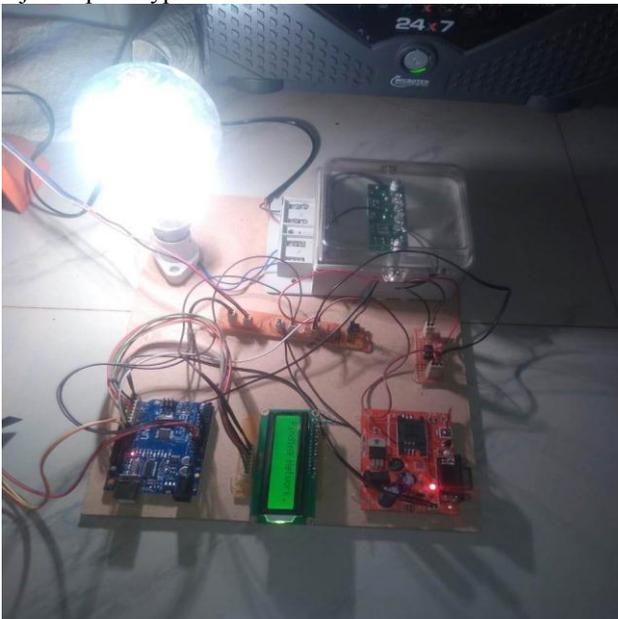


Fig. 3: Prototype's Assembly

III. RESULTS

The project "IOT Based Smart Energy Meter" was designed such that to design a system which helps in remote monitoring and control of the Domestic Energy meter through simply sending an information through wife on Thing speak and GSM in the form of SMS respectively. The system monitors the power consumption by the load and the reading of the energy meter is displayed on LCD.

IV. ADVANTAGES& DISADVANTAGES

A. Advantages

- 1) Energy conservation can be monitored on LCD display.
- 2) The system alerts through message through Wife
- 3) SMS alerts regarding number of units consumed
- 4) Efficient and low cost design.
- 5) Low power consumption.

- 6) Fast and accurate result.
- 7) Theft detection.

B. Disadvantages:

- 1) Interfacing energy meter to the Micro controller is sensitive.
- 2) It uses wired mechanism.

C. Applications:

This system can be practically implemented in real time in industries and domestic houses.

V. CONCLUSION & FUTURE SCOPE

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

Our project "IOT Based Smart Energy Meter" is mainly intended to design a system which helps in remote monitoring and control of the Domestic Energy meter through simply sending an information through wife on Thing speak and GSM in the form of SMS respectively. The system monitors the power consumption by the load and the reading of the energy meter is displayed on LCD.

This project can be extended using sensors to switch ON/OFF the devices according to the sensors.

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