

Smart Meter with Power Management Using IOT Technology

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ABSTRACT: The Existing domestic Energy meter reading structures universally exist many problems, along with effort in production, too slim bandwidth, too low fee, terrible real time, not -way communication fast and so forth. To resolve above problems, our assignment uses the wireless era for Automatic Meter Reading device. A proposed approach affords the verbal exchange most of the Electricity Board phase and the purchaser section by means of Internet of things (IOT) for shifting the patron's energy intake and invoice statistics that is supposed using ARM11Raspberry pi microcontroller. Depending at the power era, the residence maintain devices are managed spontaneously. From Electricity Board section the statistics regarding the invoice amount and fee are linked to the customer thru Global System for Mobile communique. The billing information is continuously conveyed using Internet of Things and monitored through the Electricity Board segment.

KEYWORDS: Raspberrypi, energy meter, voltage sensor, current sensor, lamp.

I. INTRODUCTION

In our venture we use strength meter that is used for measuring the strength utilities through the electrical load. Energy is the overall electricity fed on and carried out via the burden at an c programming language of time. The four principal process carried out are driving, transferring, braking and registering. Driving gadget consists of electromagnet with electromagnetic area in it. Moving system consists of aluminum disc positioned among air gap of electromagnets then, while the disc is circled a unit is displayed based totally on the load. The disc measures the energy consumption in kilowatt hours. In registering system, the primary procedure is registration or counting mechanism is to document the quantity of rotations of disc. Rotations of the disc is communicated to the pointer of the one of a kind dial for recording the specific readings. Although there are clever meters of varying generation and layout, there may be a common standard progression for records series, conversation, and analysis leading to choice help. The smart-metering manner in truth may be thought of as a part of the activation and functioning of the SG.

Depending on the vicinity, the frequency of information collection can vary from 1 hour to each 15 minutes. In phrases of the processing of records, a few information processing could be executed on the neighborhood series factors, but in maximum cases, the information are transported to the utilities principal series middle via a extensive region network (WAN). The records amassed on the utility are used for losing the man electricity with the assist of net get right of entry to.

II. RELATED WORK

There are various techniques available for measuring the power use of digital gadgets and file this information over the community. The techniques are plug load tracking system, non-intrusive load monitoring system, tool-level load tracking system.

Communicating electricity supply (CPS) consists of energy metering which measures the energy consumption of device, computation, and interface between the digital devices. A clever meter coupled to the internet rises strength alertness between devices and consumer. This paper aims at refining the accuracy of disaggregation algorithm by means of the usage of ON/OFF occasions with smart meter information to calculate the electricity intake of discrete gadgets. Maximum energy is consumed by way of plug masses in businesses. To display and manage electrical strength of plug hundreds like HVAC, there are a couple of answers available which includes constructing control machine, however there may be no answer to analyze and generate automated motion of plug masses in real time.

Internet of things has aided many logistic structures to develop talent, upward push the velocity of tactics, minimise fault and keep away from theft by means of coding and tracing the objects. Calculating and communications has its future inside the scientific alteration introduced by the IOT, speedy technical innovation within the fields fluctuating from wireless sensors to nanotechnology are chargeable for the further development of IOT. Each object can be labelled for identifying, automating, tracking and controlling.

Raspberry pi is the key understanding platform for IOT. Raspberry pi is coupled to the controller and the net. Once the Ethernet linking is about then login to raspberry pi to begin rising IoT platform. Python programming language is used. Raspberry pi send energy records to the net related server for tracking electricity use information of person device. Cloud storage and net website hosting is used for packing real-time strength data and permits different applications to touch and screen the facts. The control signal send to raspberry pi using identical server to show on/off the device.

Since IOT is fee powerful compared to SMS, tracking of electricity meters at inferior price is made in all likelihood. Daily intake unit can be determined through net threshold. The gadget is more reliable and genuine analyzing values are composed from power meters. Live readings of the energy meter can be noticed via net application. Also, the readings can be watched on-line.

The human intensive paintings is kept away from and all the values are sustained in the primary server. The communique medium is locked and changing of power meters can be diagnosed effortlessly. If an error occurs within the device, the fee in the imperative server will now not be simplified. Once the price reorganized crosses the edge time, the server can regulate that something is inaccurate within the device and might account the engineers in EB.

Thus, documentation of blunders becomes laid-again. Since the values are deposited in the vital database, the reports are made conceivable from everywhere in the global. Also, the server is on line 24x 7.

II. SYSTEM BLOCK DIAGRAM

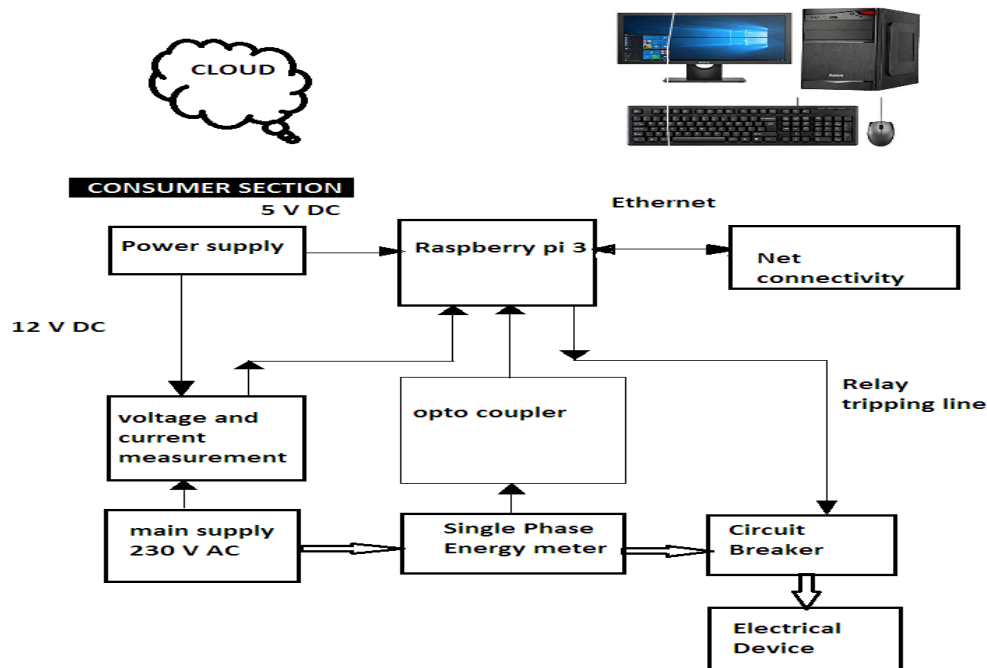


Fig. 3.1 SYSTEM BLOCK DIAGRAM

III. MECHANISM

In our project first of all 230v enter is step downed into +12v to +5v the usage of bridge rectifier. Then the raspberry pi has man or woman 230v electricity deliver. The modern-day sensor measures the modern-day intake and the voltage sensor measures the ate up electricity as analog statistics. The analog statistics received is converted into digital records the usage of ADC convertor.

Raspberry pi is a mini computer with numerous features and tactics. The GPIO is widespread cause input output pin that is used for switching ON/OFF. Raspberry pi has 16 GB external SD card for storing the facts. The amplifier used here is the operational amplifier. The apache server is the server used to switch the energy meter readings to the webpage for remark and the program is strolling using python.

The procedure initially starts offevolved from the electricity meter and the cutting-edge sensor readings is obtained in the shape of analog sign. Then that signal is transformed to virtual the use of ADC converter and the data is transferred to the raspberry pi. From raspberry pi the facts is transmitted to the webpage the usage of apache server.

IV. EXPERIMENTAL RESULT

The project obtained results can be divided into two parts namely:

- i. Experimental setup.
- ii. Web page access.



Fig. 5.2 Experimental Results

V. CONCLUSION

Thus, we have supplied net connected electricity management and energy intake amongst devices and uses. Energy consciousness allows the person to control the power country of the devices as per their needs which minimizes the electricity use. In the approaching destiny, each individual tool may have their personal identification that can percentage and communicate the facts over the protocol community.

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