

Smart Meter Data Monitoring

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ABSTRACT

This undertaking exploration to talked about an approach to checking character electrical and hardware power unit gadgets progressively information screen as utilizing wise strategy apply at procedures through information examination. The electrical force gadgets recognizable proof writing computer programs is introducing by gathered information code machine at data identified with electric force energies of framework in electrical unit apparatuses which are utilizing in residential or business fueled of at life. A functional executed information Monitoring framework ventures investigate was an actualized to remove electric force factor parameter, for example, dynamic force factors, responsive controlled, stages moved, root implies square voltage and flow uniform the apparatuses associated with it. The dissect is done used to neural systems, bolstered vector structures machines, code k-mean, decided mean-moved and outline order. The principle configuration Aims of this examination is to choosing best of order in which creates the ideal resultant in distinguished and recognizing electrical apparatuses in genuine of time from their electric parameter.

Key word-smart meter, GSM technology, power factor

1. INTRODUCTION

As a Smart meter savvy meter perusing, AI to method can be utilizations to known as the importance of an informational index in a rationale way and give valuable yields from unused datasheet for different reason. In this work, a couple regulate and unaided force utilization technique are analyze inside a steady information screen set and a superior classifier is picked for the information cloud at screen.

An electric force utilization technique, KVL systems and bolster vector machining were utilized as director learned strategies to ordered information and anticipate designs. Essentially, the genuine information screen at the hour of electrical gadget examining or distinguishing proof is finished by looked at the force energies utilization highlights of every gadget with the other electric and hardware gadgets and grouping the informational indexes in the preparation time frame and foreseeing the electrical gadget associated with the framework with another information guidance set. Here the basically electrical variable force considered in this ventures look into are in dynamic force, responsive force, stages moved, root implies square voltage and flow.

2. LOAD CALCULATION

A "GSM" shrewd meter power additionally given the data of all out stacked utilized in a houses on mentioned whenever. Absolute stacked utilized in any houses can

be "eq-1" determined by watched or recorded N number of burden beats in T time that is portrayed by condition number (2).

Total Power Load

$$= \frac{K_h * Np * 3600}{T_N} \dots \dots \dots (1)$$

where

K_h =Meter constant

Np =Number of pulse

T_N = Total pulse time of N-1 pulses.

A Energy meter also sends a SMS alerting to the energies provider companies and customers if any persons uses more than specify limit of load. The energy provider company can disconnect the power of respective customer. So customers manages their house power consumption.

The power factors uses this system and calculates

$$Power\ Factor = \frac{True\ Power}{Apparent\ Power} \quad (2)$$

$$Power\ factor\ unit = \frac{119.365W}{169.256VA} \quad (3)$$

$$power\ factor\ unit = 0.705$$

$$\cos 45.152^\circ = 0,705 \quad (4)$$

For the pure resistive loaded circuits, in the power factors uses is "119.3" or "0.705", because this reactive "power = 0". there, the power triangle methods apply to would

looked a horizontals for line, because the inverse forms of "reactive power" side would have zero length. For the pure inductance load circuit, the power factors is "0", be causes true powered = 0". there the powered triangle

methods used to look liked as vertical line, because the adjacent (true power) sided would have "0" length. The same equations to be fined for a pured "capacitive" circuit loaded . If therefore are no "dissipative" or "resistive" component in the loaded calculate at then "true power = 0".

3. PROBLEM STATEMENT

The target of the system is to make a little present day condition, where Smart meter can be screen and controlled only subject to the data got from the meter perusing keeping an eye on hand. This data is arranged and control movement set in like manner. The structure must be executed around, so no human mediation is allowed. This suggests the structure is flexible to nature. The whole control contraption of the structure it's a little Raspberry PI. This enrolling system its used in light of the truth to show that the whole mechanical structure can be automated just with a card size figuring system or a microchip and the cutting edge condition data can be seen or checked from Loaded.

The objective of this undertaking is to make PWM repeat in 328- microcontroller to control the speed of the single stage acknowledgment motor. In this assignment we are making repeat to control speed of single stage selection motor. By using the item direction we are making repeat for PWM wave in the Atmega-328 microcontroller. It is the flicker type microcontroller in which we have recently changed.

4. SMART METER READING DATA MONITOR

The estimates breaks down energies data on monitor by "end use". Connected used reporting by "Home Energies Saver" include" heating", "cooling", "water heating", major appliances, or small appliances, & lighting. The schematics designed was done in ""Dip trace" software ,

which is a parts of Mentor “PCB schematic design” Suite(version 2.5).The principal schematics of the Receiver module can be divide in 2-parts .The input power circuit module is in Figure 4.1

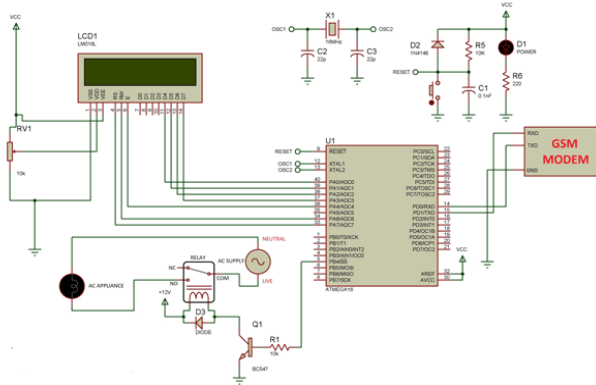


Figure 4.1:- Schematic SMRD

The input power "12V" is supplied is used the supply voltages for the system. Then undesired frequencies are remove by capacitors-input filter (C1& C4 capacitors). Then the ripple factors are further removed by L3 inductors & the supplied is fed into a U3 low-drop out regulators (LDO) which supplies "5V" for the microcontroller.

4.1 FLOW CHART

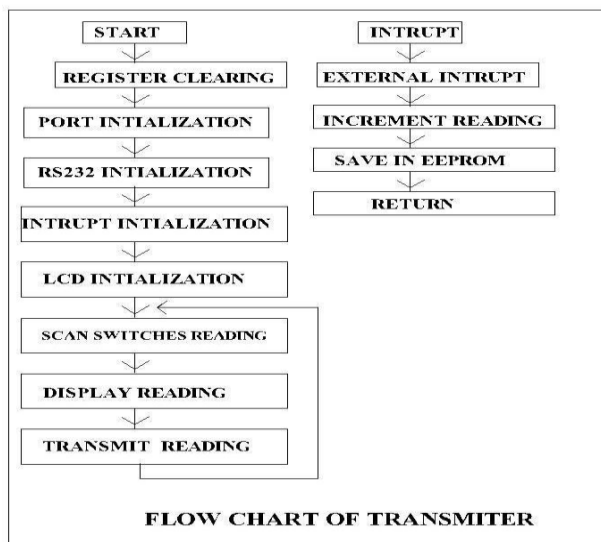


Figure 4.2:- Flow chart of Smart meter by GSM

5. RESULT ANALYSIS

The meter Power unit line data and because of Saver check bring about programming testing effectively transfer a code and connect the circuit or run the program and create Hex record and check result which are playing out the code. From the information screen gathered and the expectation tests, it was cleared that to recognize an electrical gadgets with a higher precision the methods of activities and complete practical cycle of each electrical gadgets must be learned by the calculation. The greater part of the electric gadgets with basic scope of execution can be simple distinguished. Be that as it may, gadgets with complex methods of activities should be tried and prepared for the calculation for a significant measures of time to get exact outcomes. The primary perceptions in the tests were that for every electric gadgets there is its own specific manner of obtaining power which can be distinguished as a cycle of execution.

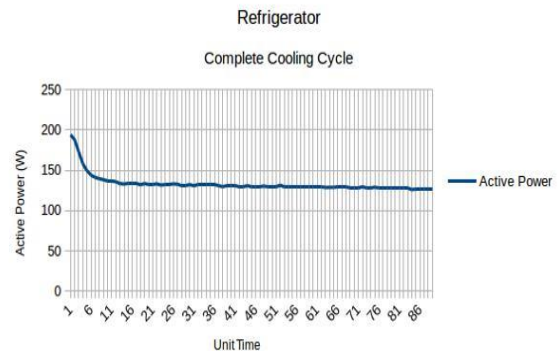


Figure5.1:-Active Power Consumption Cycle of Refrigerator

In recognizing an electrical gadgets, the primary things is to discover a method for separating it from different gadgets. The presence of a cycle comprehends to the conduct of an electrical gadgets in various period of its total cycle. Without understanding the full cycle, anticipating or ongoing distinguish of an electrical gadget isn't precise. Here in the explored, numerous gadgets which are utilized at family unit were tried and the cycles

were plotted. Clearly when the informational index spread more measure of the cycle the forecast outcomes were exact

[9] "G. T. Heydt", Virtual surrounding face geo casting in wireless ad hoc and sensor networks, "Electric Power Quality": A Tutorial Introduction, vol. 11, no. 1, pp. 15-19, Jan. 1998.

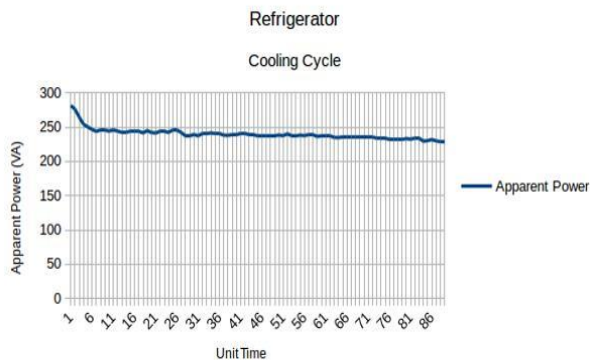


Figure 5.1:- Result refrigerator output

REFERENCES

- [1] "Vinu V Da", "Wireless Communication System" for "Energy Meter" Reading " International Conference on Advances in Recent Technologies" in Communication and Computing 2009.
- [2] "Ashna.k" , "Sudhish N George". "GSM Based Automatic Energy Meter" Reading System with Instant Billing 978-1-4673-5090-7©2013 IEEE
- [3] "Liting Cao", "Jingwen Tian" and "Dahang Zhang" "Networked Remote Meter-Reading System Based on Wireless Communication Technology" IEEE International Conference on Information Acquisition, August 20 - 23, 2006, "Weihai", "Shandong, China"
- [4]"A. Arif" , "Muhannad AI-Hussain", "Nawaf AI-Mutairi", "Experimental Study and Design of Smart Energy Meter for the Smart Grid" 978-1-4673-6374- 7©2013 IEEE
- [5] "Ashna.k" , "Sudhish N George". "GSM Based Automatic Energy" Meter Reading System with Instant Billing 978-1-4673-5090-7©2013 IEEE.
- [6] "Adnan Rashdi," "R. Malik", "S. Rashid", "A. Ajmal", "S. Sadiq" , "Remote Energy Monitoring", Profiling and Control Through "GSM Network", International Conference on Innovations in Information Technology (IIT) 2012.
- [7] Smart meter Implementation Strategy Prospectus. July 2010. DECC, Ofgem/Ofgem E-Serve.
- [8] "T. Chandler", "The technology development of automatic metering and monitoring systems," in IEEE International Power Eng. Conf., Dec. 2005.