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Prepaid energy meter with GSM module and theft detection

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Abstract--- ***The GSM technology is employed in order that the patron would receive messages regarding the consumption of power (in watts) and if it reaches the minimum quantity, it might mechanically alert the patron to recharge. This technology holds smart for all electricity distribution firms, non-public communities, IT parks and self-containing housing comes. The implementation of this paper can facilitate in higher energy management, conservation of energy and additionally in doing away with the supererogatory hassles over incorrect asking. The machine-controlled asking system can keep track of the important time consumption and can leave very little scope for disagreement on consumption and asking. A theme of electricity asking system known as "prepaid energy meter with tariff indicator" will facilitate in improved income management in energy utilities and might reduces downside related to asking shopper living in isolated space and reduces preparation of force for taking meter readings.***

Keywords: ULN2003, relay, LDR, energy meter, ARM 7, GSM

I. INTRODUCTION

In recent years several makes an attempt are created to style the energy meter with instant charge technique however until currently the designed energy meters aren't economical and don't give replacement. Now-a-days the numbers of Electricity shoppers square measure increasing in nice extent. It's onerous to handle and maintain the facility attributable to growing needs. Maintenance of the facility is a crucial task because the human operator goes to consumer's house and produces the bill as per the meter reading. The charge method takes a lot of time if the shoppers isn't within the house whereas taking readings on energy consumption. It needs lots of your time and additional labor to research energy consumption and generating the bill. If the buyer failed to pay the bill, the Foreman has to head to their homes to disconnect the facility provide. These consumes time and troublesome to handle. The manual operator cannot realize the Un-authorized connections or malpractices dispensed by the buyer to scale back or stop the meter reading/power provide. a number of the energy meters that had been enforced square measure paid however it wants web to recharge it. The key disadvantage of that methodology is that it wants web and also the laptop interface. During this paper we tend to propose a way that uses GSM Network that eliminates the necessity of web.

II. RELATED WORK

1Event-Driven Energy Metering: Principles and Applications
Mikhail Simonov, *Member, IEEE*, Gianfranco Chicco, *Senior Member, IEEE*, and Gianluca Zanetto

Recent developments in good metering applications have crystal rectifier to the conceptualization and construction of a brand new kind of energy meter, operative on the premise of event-driven principles. The event-driven metering ideas ar applied to represent the data on the electrical load patterns, that have associate degree integral price. This paper explains why these ideas ar completely different from those used for event-based applications in alternative domains, discusses the principles utilized in the new kind of electricity meter, presents the info formats structured in such some way to supply elaborated information illustration, and shows variety of results on real-case applications.**2.Assesment of Electric Energy Losses Aiming at Detection of Thefts of Electricity**

Dimo Stoilov Ivan Zagorchev, Velichko Atanasov

The paper describes relations between technical, nontechnical associate in total electrical energy losses in power systems and presents an innovative methodology for his or her correct assessment aiming at detection of thefts of electricity within the distribution networks. The facility losses square measure outlined because the distinction between the moment wattages measured in 2 real points or measured in 2 sets of real points within the electrical power system.

NEED OF THE PROJECT

The present electrical energy asking system in West Bengal (India) is time overwhelming and tedious. An electrical board (EB) workers came to every home and author current and former reading of digital energy meter, then calculate unit of energy consumed and prepare bill. Therefore the homeowners need to expect EB workers once they can return. During this asking system user and provider each need to provide time, conjointly then user need to attend asking station to paid energy bill. reversible paid meter supported smash technology improve the asking system, wherever shopper need to obtain heat unit advance and also the range of unit is depend upon shopper.

SYSTEM ARCHITECTURE

Design of system

The paid energy meter is advanced technology in order that it's usable to save lots of client moreover as Electricity board temporal order conjointly felony wont to detect felony and wastage of electricity.

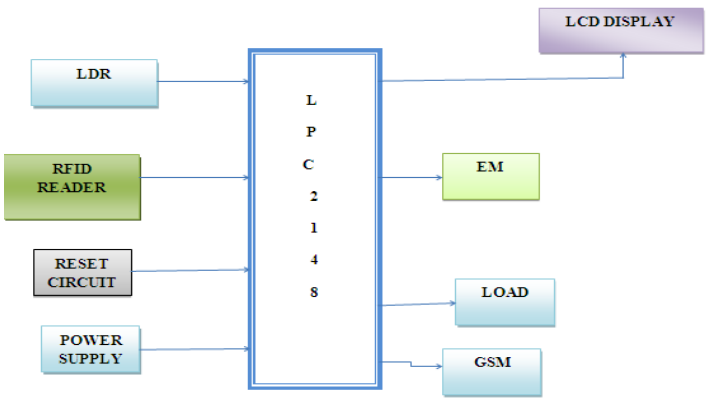


Fig. Block diag. of prepaid energy meter system

III. COMPONENTS AND SYSTEM DESIGN:

1.ARM 7

The ARM7TDMI-S may be a general purpose 32-bit microchip, that offers high performance and really low power consumption. The ARM design is predicated on Reduced Instruction Set pc (RISC) principles, and therefore the instruction set and connected rewrite mechanism area unit abundant easier than those of small programmed complicated Instruction Set Computers (CISC). This simplicity ends up in a high instruction output and spectacular period interrupt response from a tiny low and cost-efficient processor core.

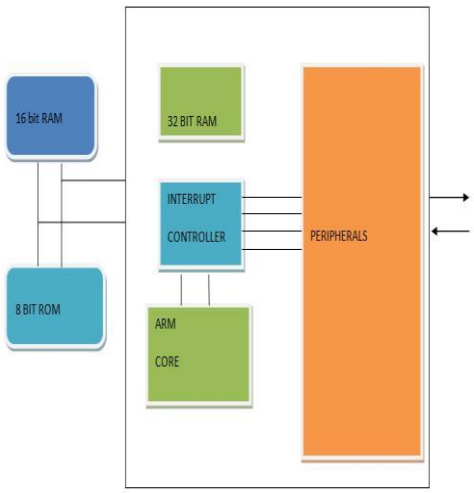


Fig. Arm Based System.

2.LIQUID CRYSTAL DISPLAY

LCD stands for liquid show. liquid crystal display is finding wide unfold use replacement LEDs (seven section LEDs or alternative multi section LEDs) owing to the subsequent reasons:

1.The declining costs of LCDs.

2.the flexibility to show numbers, characters and graphics. this can be in distinction to LEDs, that square measure restricted to numbers and a couple of characters.

3.Incorporation of a refreshing controller into the liquid crystal display, thereby relieving the central processor of the task of refreshing the liquid crystal display. In distinction, the crystal rectifier should be reinvigorated by the central processor to stay displaying the info.

4. simple programming for characters and graphics.

3. RFID reader

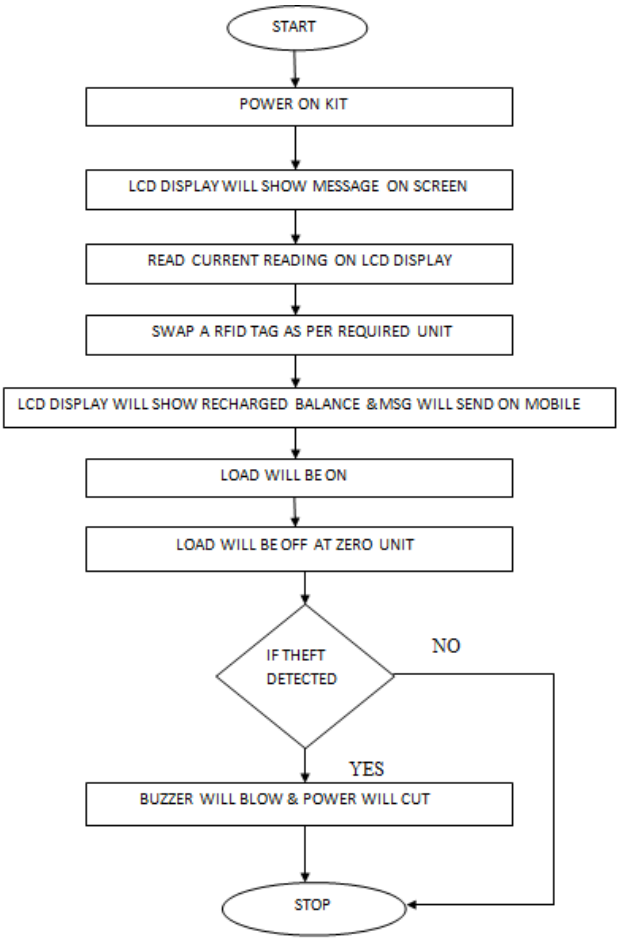
A frequence identification reader (RFID reader) may be a device accustomed gather data from AN RFID tag, that is employed to trace individual objects. Radio waves square measure accustomed transfer knowledge from the tag to a reader. A frequence identification reader (RFID reader) may be a device accustomed gather data from AN RFID tag, that is employed to trace individual objects. Radio waves square measure accustomed transfer knowledge from the tag to a

reader. RFID tags with integrated circuits square measure the foremost used systems on the particular market. they're composed of antenna and an computer circuit.

IV. GSM MODEM

This GSM electronic equipment may be a extremely versatile plug and play quad band GSM electronic equipment for direct and straightforward integration to RS232. Supports options like Voice, Data/Fax, SMS,GPRS and integrated TCP/IP stack.

V. FLOWCHART:



VI. ADVANTAGES AND APPLICATIONS:

ADVANTAGES:

- Cost of manpower for billing / collection is reduced.
- Sophisticated security
- Better customer service

APPLICATIONS:

- Banks
- Offices
- Industries
- Jeweler Shops and Home Applications

VII.CONCLUSION AND FUTURE SCOPE:

The paper is meant to gift an outline of paid energy meter, which might management the usage of electricity on client facet to avoid wastage of power. paid energy meter could be a thought to reduce the Electricity thieving with a value economical manner.

1. The users aren't guaranteed to pay excesses quantity of cash, users have to be compelled to pay in step with their demand.

2. It will cut back issues related to request customers living in isolated areas and cut back readying of hands for taking meter readings.

3. paid energy meter is a lot of reliable and user friendly.

From of these we are able to conclude that if we tend to implement this paid energy meter then it can become a lot of useful. Energy thieving detection is extremely needed, as population and energy demand is increasing day by day in order that we will implement a lot of advance technology to sight energy thieving on grid lines additionally.

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