

Automatic Multiple Meter Reading System

Akansha Bhargava¹ Nikunj Sondagar² Aniket Surve³ Swapnil Mone⁴ Mayur Zanzane⁵

¹Assistant professor ^{2,3,4,5}B.E.Student

¹Department of Electronics and Communication Engineering
^{1,2,3,4,5}Atharva College of Engineering, Mumbai University

Abstract— In the earlier days there were 2 types of meters namely the dial type and the digital type. The dial type meters became obsolete and the digital meters were widely implemented by all electricity operators as they were more efficient and accurate. These digital meters register electricity utilization in terms of kWh. The current technique of meter reading is a person from electricity operator visits housing premises and manually reads the meters. This requires enormous amount of hardwork, labour operators and long working hours to achieve data reading and billing of the entire area. The reading systems controlled by human billing employees are susceptible to error and moreover meters placed in far off locations are not easy to reach. The condition of such systems becomes even worse due to weather conditions. In order to achieve efficient meter reading, reduce billing error and operation costs, Automatic Multiple Meter Reading System (AMMRS) plays an important role to address the above mentioned problems. AMMRS is an effective mean of data collection that allow substantial saving through the reduction of meter re-read, greater data accuracy, allow frequent reading, improved billing and customer service, more timely energy profiles and consumption trends updates and better deployment of human resources.

Key words: Automatic Multiple Meter Reading System (AMMRS), Global System for Mobile communications (GSM), Graphical User Interface (GUI), Liquid Crystal Display(LCD), Collector Unit, Reader Unit

I. INTRODUCTION

Previously there was a meter reading system in which every individual meter were assigned a separate Global System for Mobile communications(GSM) module and it's reading was sent to a control center. But the disadvantages of this system is that it is very costly to connect GSM module to each and every meter which further increases the installation complexity of GSM modules also and even makes the maintenance of the system difficult. Moreover this system requires excessive billing time due to use of individual GSM module. The modification that can be done to this meter reading system is to connect just one GSM module for every housing society and a reader unit that would interact with all the meters. This saves a lot of time and money. Automatic Multiple Meter Reading System (AMMRS) raises the bar with regard to traditional Automatic Meter Reading(AMR) in that it enables two-way communications with the meter, resulting in better service to it's members. Our method deals with providing only one GSM module for every society and a reader unit which interacts with all the meters. Multiplexing is achieved with the help of multiplexers and demultiplexers. TDMA multiplexing technique allots the entire bandwidth to each user for a particular time slot. This in turn increases the overall speed of the system and overcomes the drawback of AMR system of excessive billing time. Thus TDMA multiplexing takes reading of all the meters one by one and sends the reading by SMS to a central control unit. On the control unit side we have developed a software which takes these readings for each housing society and logs it into database. The "Fig.1" corresponds to how the switching takes place in the selection of a meter.

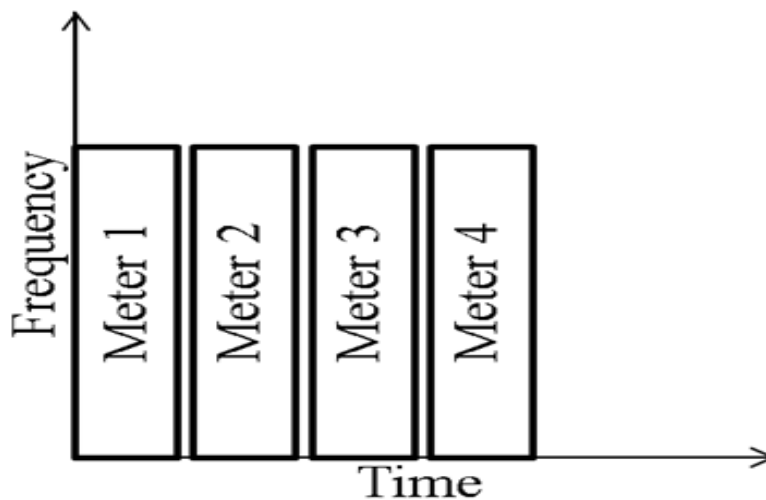


Fig.1

II. LITERATURE SURVEY

According to Mr. Rahul Ganesh Sarangle, Prof. Dr. Uday Pandit Khot ,Prof. Jayen Modi / International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com Vol. 2, Issue 4, June-July 2012, pp.664-671, Automatic Meter Reading (AMR) technology, electrical utilities (EUs) have been exploiting their own infrastructure to bill their customers in an efficient and economical way. Since the amount of data that has to be send is quite low related to the available time to perform this task, AMR applications have been demanding low bit rates. At this moment, EUs are exploring and demanding other services as load and alarm management, remote monitoring and disconnections, etc. In this context, the Low Voltage modems should provide more throughout while keeping the cost of the hardware low. The results of this low complexity AMR technology are that in order to deploy an AMR network, the cost of the equipment on the customer premises and the added value services that system.

III. EXPERIMENTAL SETUP

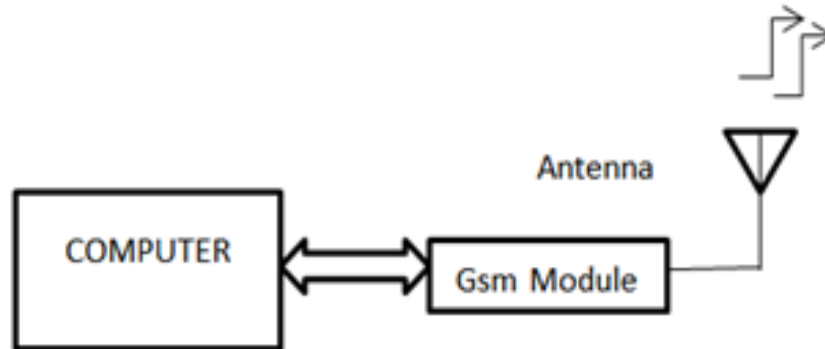


Fig. 2: Collector Unit

The action of reading the meters will be initiated from Collector Unit as shown in “Fig.2” using a Graphical User Interface (GUI) developed with the help of VB .Collector Unit comprises of Computer and GSM Modem which will be interfaced using RS-232 protocol. The GUI will be used to send a Request SMS through GSM Modem using AT command set to the Reader Unit.

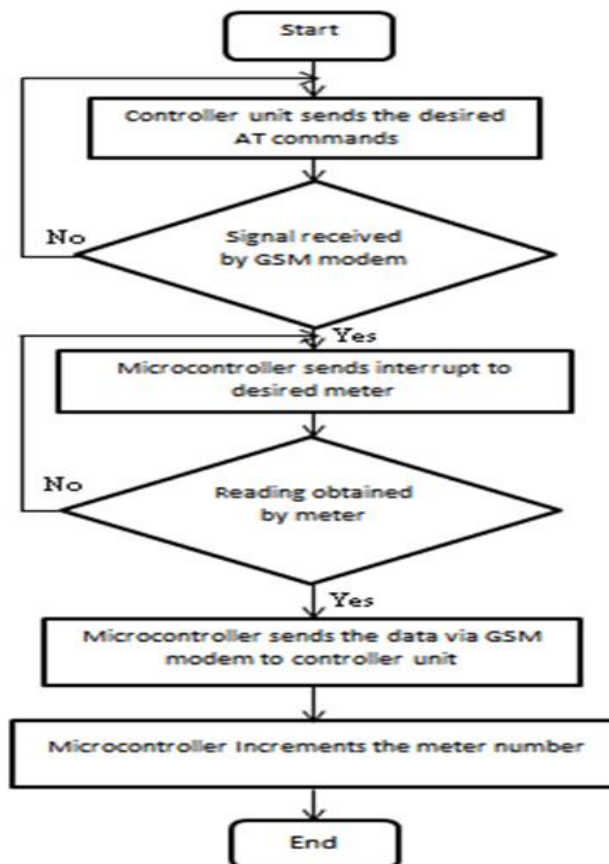


Fig. 3: System Flow

C. Compact

It is quite compact and can be carried anywhere you want.

D. Remote meter re-read

It is capable to communicate with meters and upload information on the amount of electricity consumed for time period that can range from 2-3 minutes E. Remote service switching: Meters can be switch ON or OFF in case of reoccurring non-payment issues

E. Easy to use

As mention before the controlling part is easy it can be operated from pc just by clicking on particular instruction shown in GUI screen.

F. Transparency

The customer can track their electric power usage more effectively.

G. Multiple applications

Can be used in housing society, office building as well as at industrial sites and can also be used for various other applications such as in temperature measurement in mines

V. APPLICATIONS

Automatic Multiple Meter Reading System is an effective and cost efficient method of meter reading in a housing society and residential complexes. This system is quite helpful for the offices which are having many of their office branches. In such case, the entire meter reading data's can be taken and stored at their main office. This system can also be installed at hydraulic power station to check the amount of water utilization. It can also be used by municipal co-operation to check the unit amount of water supplied to building and complexes. It can also be used by other industries who needs their respective parameters to be checked such as electricity, steam, water and petrol

VI. CONCLUSION

From this we concluded that, for the fast growing world, everything need to be fast, sophisticated, accurate, precise and all this requirement in electric power meter reading field is full filled by this system. The AMMR system takes the advantage of existing GSM infrastructure thus reducing implementation cost, simple and easy installation of GSM Power Meter at consumer side. The GAMMR system proven to provide more effective, reliable and efficient wireless automatic power meter reading and notification through the use of GSM network, thus reduce human operator meter reading operation cost.

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