Vehicle assisted device to device data delivery by using Smart grid

[1]A.ARUN KUMAR, [2]Dr.B.DURGA PRASAD, [3]Dr. M.P. RANGAIAH

[1]*PG Research Scholar, Product design, Mechanical Engineering, JNTUA College of Engineering, Ananthapuramu, Andhra Pradesh, India*
[2]*Professor of Mechanical Engineering, JNTUA College of Engineering, Ananthapuramu, Andhra Pradesh,*
[3]*Lecturer of Mechanical Engineering, JNTUA College of Engineering, Ananthapuramu, Andhra Pradesh*

Abstract- Efficient power consumption and savings has become a major issue these days as the need for power is increasing day by day. Domestic energy consumer is unaware of his power usage. Various technologies have been developed and used to measure the electrical consumptions. There is a need to save the power. With the help of microcontroller's the increasing technology for developing communication of wireless network, they are various improvements in automatic different aspects for industrial concern to reduce the human efforts. For manual handling of meter reading is not suitable for working with longer purpose it leads to large amount of human workers and natural resources. Based on Wi-Fi technology the project is a system for a remote meter-reading. The readings of energy meter are constantly monitored and the user can monitor readings of energy meter remotely in his android phone by using Wi-Fi based technology and the energy meter readings are also showed on the LCD screen.
Keywords: PIC microcontroller, Wi-Fi module, energy meter, LCD display, Android mobile phone.

I. INTRODUCTION

Recently, smart grid (SG) was concerned more interest from research side and engineering in both power and communication fields. SG is a system of power advanced and moderately aims to checking, managing and delivering electric power in a efficient manner and as well as reliability wise with including state-of the-art communication technologies into the power grid.

In the traditional method of billing, we know that a person coming from the electrical section he was checking the electrical meter in front of our home and taking the no of units are measured and taking that given to that person in that home for each month. It is a one type of readings of energy meter. According to that reading we have to pay the bills. The main problem of this process the person goes from one place to another place for checking the readings of energy meter of each home and giving the slips. Large number of times leads to common errors like no of units are increasing by operating the meter of that person and getting complaints from customer to the board of electricity. So, wireless based remote monitoring of the energy meter has to be developed. So, that user can monitor the readings of energy meter at any instant of time.

II. LITERATURE SURVEY

[1] In this work consumption of electricity by the user i.e. In energy meter consumption of units sending to the personal computer with the help of zigbee module and reading the units 16X2 LCD. For example in energy meter the values are changing in the count value per the no of units which shows on the LCD. For functioning the communication we are using the zigbee module.

[2] In this work, we are implementing a frame work heterogeneous for delivering data of smart grid with effectively cost. The important applications of smart grid, generating the data by the distributed loads of smart grid and units of generation must be delivers to control center utilization within tolerate delay. So that finally for the communication purpose of implementing framework heterogeneous, providing the network cellular everywhere cause high expensive for the transmission of data and assisting of vehicle device to device communication leads to investing to offload the network of cellular by deliver the tolerant delay. The data of smart grid in a store carrying and forward manner with less price. For improving the performance of cost and offloading implementing the framework, By considering the following aspects i) Selecting the vehicles for carrying and data forwarding with schemes of forwarding optimally. ii) The amount of data is maximum using data delivery by communications of D2D, reducing the cost data delivery of SG, guarantee and equal justice among the users of SG so that the selection of mode and allocation of dynamic resources is concerned. Finding the results of simulation are taking to implementation of valid approach and demonstrating the implementing framework is efficient in cost saving for the utilization and network cellular of offloading.

III. IMPLEMENTATION

Microcontroller forms the controlling module and it is known as heart of device. Wi-Fi module, energy meter, LCD are interfaced to the microcontroller. By the user consumption of energy will be measured by using energy meter. In this project electricity consumption by the user i.e. in energy meter consuming no of units sending to the user mobile using Wi-Fi module and also measuring the units by using LCD. For example in energy meter the values are changing in the count value per the no of units which shows on the LCD. For functioning the communication we are using the Wi-Fi technology. For performing this smart task, by using embedded 'C' language writing in program and loaded with the microcontroller.

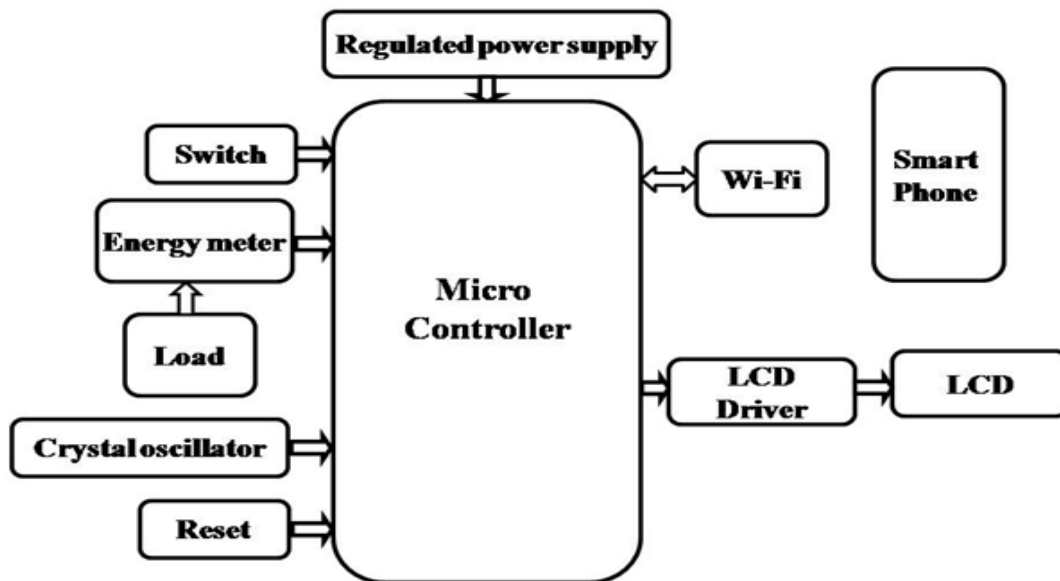**Vehicle-Assisted Device-To-Device Data Delivery For Smart Grid**

Fig.1 Block diagram of vehicle assisted device to device delivery by using smart grid

IV. RELATED WORK

The brief introduction of different modules used in this project is discussed below:

V. PRRIPHERAL INTERFACE CONTROLLER (PIC16F72)

The PIC16F72 has a place with a type of 8-bit microcontrollers of RISC engineering. Its common structure is appeared on the Accompanying guide The PIC16F72 is one of the types of peripheral interface controller. A Microcontroller is a programmable digital processor with necessary peripherals. It consists of 4KB of ROM and 128 bytes of RAM. Operating voltage is about 2v to 5.5v.

Fig.2 PIC16F72 Micro controller

VI. DIGITAL ENERGY METER

The measurement of energy by using a digital energy meter of non sinusoidal waveforms, generally in physics power is defined as the product of voltage and current in a sampled waveform. Base on the duration of time we are calculating the how much power consumption is generated with the no. of units. By the algorithm measurement of energy is obtained which require simple form of division by a power of two.

Fig.3 Digital Energy Meter

VII. LED INDICATOR

A light emitting diode (LED) is a semiconductor mild basis. Pushers are used as marker lighting in numerous gadgets, and are logically used for lighting fixtures. Displayed as a sensible electronic segment in late 1962, early LED's created low-pressure crimson light, but cutting-edge variations are on hand over the unmistakable, vivid and infrared wavelengths, with excessive brilliance. The inward shape and components of a drove are seemed in figures. The shape of the Light Emitting Diode mild is surely unique in connection to that of the light. Unfathomably, the Light Emitting Diode has a clear and strong shape. The light-transmitting semiconductor cloth is the component that chooses the Light Emitting Diodes shading. The Light Emitting Diode relies upon the semiconductor diode.

Fig.4 LED Indicator

VIII. LIQUID CRYSTAL DISPLAY

A standout amongst the most well-known gadgets connected to a miniaturized scale controller is a LCD show. Probably the most well-known LCD's related with the numerous microcontrollers are 16x2 and 20x2 demonstrations. This implies 16 characters for every line by 2 lines and 20 characters for each line by 2 lines, distinctly. Essential 16 x 2 Characters Liquid Crystal Display.

Fig.5 Liquid Crystal Display

The liquid crystal display calls for three manage lines and what's more both 4 and 8 I/O traces for the information shipping. The patron might also pick out whether the liquid crystal display is to paintings with a 4-bit data delivery or an 8-bit statistics transport. In case a 4-bit statistics delivery is used the liquid crystal display would require an entire of seven facts lines (3 manage lines notwithstanding the 4 strains for the records transport). If an eight-bit data transport is utilized the liquid crystal display will need an aggregate of eleven statistics lines (three manipulate strains notwithstanding the eight strains for the statistics delivery).

IX. ANDROID

In operating system (os), android is an open source which was created by the Google specifically for the using of mobile devices (cell phones and tablets)Linux based (2.6 kernel)Can be programmed in C/C++ but most of the development of apps is done in Java (Java access to C Libraries via JNI (Java Native Interface))Supports network of 3G and 4G, Wi-Fi and Bluetooth.

Fig.6 Android

X. Wi-Fi MODULE (ESP8266)

The **ESP8285** is an ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi Processor: L106 32-bit RISC microprocessor core based on the Ten silica X tensa Diamond Standard 106Micro running at 80 MHz External QSPI flash: up to 16 MiB is supported (512 KiB to 4 MiB typically included), IEEE 802.11 b/g/n Wi-Fi Integrated TR switch, balun, LNA, power amplifier and matching network WEP or WPA/WPA2 authentication, or open networks 16 GPIO pins Both the CPU and flash clock speeds can be doubled by over clocking on some devices. CPU can be run at 160 MHz and flash can be sped up from 40 MHz to 80 MHz Success varies chip to chip.
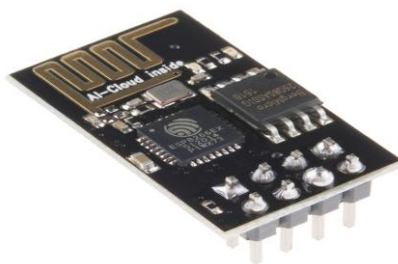

Fig.7 WI-FI Module

XI. CONCLUSION

The existing model presents an Integrating feature of all the hardware components which has been used and developed in it with PIC16F73 The Presence of each and every module has been reasoned out and placed very carefully. Hence the contributing to the best working unit for "VEHICLE ASSISTED DEVICE TO DEVICE DATA DELIVERY FOR SMART GRID" has been designed perfectly. Thus, the project has been successfully designed and tested.

XII.ACKNOWLEDGEMENT

XIII.REFERENCES

[1] P. Siano, C. Cecati, H. Yu, and J. Kolbusz, "Real time operation of smart grids via FCN networks and optimal power flow," IEEE Page 291 Trans.Ind. Inf., vol. 8, no. 4, pp. 944–952, Nov. 2012.

[2]. W. Su,H. Eichi,W. Zeng, and M.Y.Chow, "A survey on the electrification of transportation in a smart grid environment," IEEE Trans. Ind.Inf., vol. 8, no. 1, pp. 1–10, Feb. 2012.

[3]. F. Benzi, N. Anglani, E. Bassi, and L. Frosini, "Electricity smart meters interfacing the households," IEEE Trans. Ind. Electron., vol. 58, no. 10,pp. 4487–4494, Oct. 2011.

[4]. J.Haase, J.M. Molina, andD.Dietrich, "Power aware system design of wireless sensor networks: Power estimation and power profiling strategies,"IEEE Trans. Ind. Inf., vol. 7, no. 4, pp. 601–613, Nov. 2011.

[5]. P. Palensky and D. Dietrich, "Demand side management: Demand response, intelligent energy systems, smart loads," IEEE Trans. Ind. Inf.,vol. 7, no. 3, pp. 381–388, Aug. 2011.

[6]. Y. H. Jeon, "QoS requirements for the smart grid communications system," Int. J. Comput. Inf. Sci., vol. 11, no. 3, pp. 86–94, 2011.

[7]. Y. Simmhan, Q. Zhou, and V. K. Prasanna, "Chapter: Semantic information integration for smart grid applications," in Green IT: Technologies and Applications. Berlin, Germany: Springer, 2011.

[8]. Z. M. Fadlullah, M. M. Fouda, N. Kato, A. Takeuchi, N. Iwasaki, and Y. Nozaki, "Toward intelligent machine-to-machine communications in smart grid," IEEE Commun. Mag., vol. 49, no. 4, pp. 60–65, Apr.2011.