ISSN 2278-9723
DOI:10.31838/ijccts/10.01.01

Research Article

Advanced Electricity Billing System Using Aurdino Uno

K.SRILAKSHMI[1], K.PREETHI[2], MD.AFSHA[3] ,N.POOJA SREE[4],M.VENU[5]
[1,2,3,4]Department Of Electronics And Communication Engineering Student, KKR AND KSR Institute of technology and sciences, Guntur, Andhra Pradesh
[5]Department Of Electronics And Communication Engineering Student, Assistant Professor, KKR AND KSR Institute of technology and sciences, Guntur, Andhra Pradesh
Email: Kammasrilakshmi9999@gmail.com[1],mdafsha1234@gmail.com[2],preethikousalya123@gmail.com[3], poojasreenarne123@gmail.com[4],nkv8593@gmail.com[5]
Received: 11.01.22, Revised: 10.02.22, Accepted: 06.03.22

ABSTRACT
Electricity energy meters, the direct billing interface between utilities and customers for long time, have undergone several advancements in last few decades. The conventional electromechanical meters are being replaced by new digital meters to improve accuracy in meter reading still, India power sector faces a serious problem of lean revenue collection for the actual electric energy supplied owning to energy thefts and network issues. In the present scenario one of the main problem is the traditional billing system taking a reading and generating bills is manual work which is accurate, slow, costly and lack in flexibility as well as reliability. In some areas cameras are used for reading which is very expensive and not user friendly they require an individual agent come down personally to customer place and note the meter readings and report the amount one has to pay to household office. Sometime user did not pay the bills on time so the electricity board worker cut the power supply manually. To overcome all the problems, we prepared a smart electricity meters using Arduino UNO.

Keywords: Energy Meter, Message Communication, Arduino UNO, Electricity billing Device

Introduction

Electric energy meter, the direct billing interface between utility and consumers for long time. India power sector faces a serious problem of lean revenue collection for actual electricity energy supplied owing to energy thefts and network issues to overcome these issues we introduced a smart digital energy meter which can generate current by its own using Arduino UNO. This system send a message to customer phone as the usage of current units and amount it will be more beneficial to consumers by monitoring their with out any man power. It may reduces error rate and decreases the amount spending by the government on electricity billing system.

Objective

- In present scenario, one of the main problem traditional billing system which is accurate, slowly, costly and lack in flexibility.
- Power theft is one of the major problem in India.

Methodology

Programs are written by using Keil software and the program is loaded to the ARDUINO. And now connections as per the circuit diagram. And make sure that no common connection between AC and DC supplies. Apply the power supply to the circuit and LCD display then works then it asks to enter the password.

Implementation

For the Advanced Electricity Billing System,realization are response to the software must be kept in the right format. The project is implemented by an EEPROM for user for a more Billing of a system.

Hardware Requirement

EEPROM

EEPROM (also written E2PROM and pronounced "e-e-prom", double-e prom", "esquared",Or simply "e-prom") stands for Electrically Erasable Programmable Read Only Memory and is a type of on- volatile memory used in computers and other electronic devices to store small amounts of data that must be saved when power is removed, e.g., calibration tables or device configuration.
When larger amounts of static data are to be stored (such as in USB flash drives) a specific type of EEPROM such As flash memory is more economical than traditional EEPROM devices. EEPROMs are organized as arrays offloating gate transistors**.**

LCD Display

LCD from the name "Liquid Crystal" itself. It is actually a combination of two states of matter

– the solid and the liquid. They have both the properties of solids and liquids and maintain their respective states with respect to another

For ease of interaction with the user, this system uses an electronic display module. Here a 16x2 LCD is used. This means in 2 lines it is possible to display 16 characters per line. A 5x8 pixel matrix is used for display one character. Two registers are associated with an LCD, such as data and command. These modules are preferred since it is easily programmable. For providing visual assistance to the lineman this is unavoidable.

preferred since it is easily programmable. For providing visual assistance to the lineman this is unavoidable

Fig.1 LCD display

Arduino

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs – light on a sensor, a finger on a button, or a Twitter message – and turn it into an output – activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

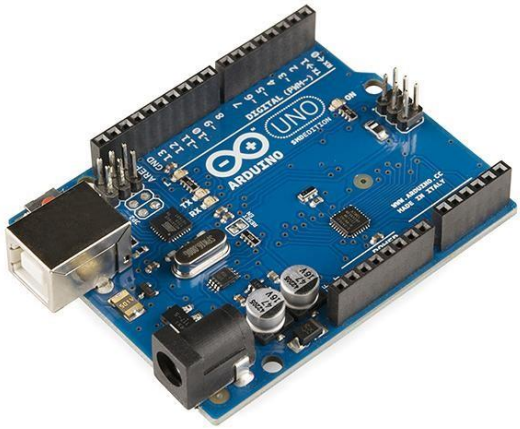

Fig.2: Arduino

Software Requirements

Keil compiler

Keil implemented the first C compiler designed from the ground-up specifically for the 8051 microcontroller. Keil the provides a broad range of development tools like ANSI C compiler, macro assemblers, debuggers and simulators, linkers, IDE, library managers, real-time operating systems and evaluation boards for Intel 8051, IntelMCS-251, ARM and XC16x[1]/ C16x[2]/ST10[3] families.

Languages Used

Embedded C Language

An embedded system is an application that contains at least one programmable computer (typically in the form of a microcontroller and microprocessor or digital signal processor chip) and which is used by individuals who are, in the main, unaware that the system is computer- based.

Advantages

- Tackle of human error.
- Billing will be flexible and fast.
- Customize rates and billing dates.
- Provides real time data useful for balancing electric load and reducing power outcomes.

Disadvantage

- The system fails if there is no network because without a network the device can't send SMS.

- Requires fixed GSM number.

Results

This proposed system provides the data about how much current user consumed and also gives the data about how much amount we have to pay to government. In this system meter is connected to AURDINO UNO that helps to collect data without using man power and send the message to user.

Fig.3. Module of the circuit

Applications

- The system can be used in domestic and commercial area for electric supply.
- This system can be used gas supply lines as well as water supply.

Conclusion

This paper approaches new approach of energy meter monitoring system by using AURDINO UNO as microcontroller and GSM module as interface with the users in the purpose of the flexibility of the customers to monitor their mobile phones. The results shows that the system works successfully.

Future Scope

- Future research is controlling the energy meter, meaning instead of just monitoring the meter, usage, power consumptions by themselves remotely from their mobile phones.

References

1. M. Arbulu and C.Balaguer, "Human-Humanoid robot co-operation in collaborative transportation tasks", in Proc of Clawar 2008, Coimbra Portugal 2008.
2. Lang Yuedong, "Design, stimulation and walking experiment for a Humanoid robot with Multiple Locomotion Modes".
3. S. Kajita, A. Kobayashi and T. Yamamura, "Dynamic walking control of robot along a potential energy conserving orbit".
4. Guan Y S, Yokoi K, Tanie K. Feasibility: Can humanoid robots overcome given obstacles? Proceedings of the IEEE International Conference on Robotics and Automation, Barcelona, Spain, 2005, 1054–1059.
5. Verrelst B, Stasse O, Yokoi K, Vanderborght B. Dynamically stepping over obstacles by the humanoid robot HRP-2. Proceedings of the 6th IEEE-RAS International Conference on Humanoid Robots, Genova, Italy, 2006,117–123.