Automatic Identification of Electricity Theft

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Abstract: *In proposed system automatic identification of electricity theft using arduino. If we implement the project for a complete network of a area which will be consuming a very huge amount of energy. Here we are using arduino board, LCD display, current sensor, buzzer. And here in this project we can calculate the energy or power transmitted by the KEB and the energy consumed by the network of area. If both transmitted power by the KEB and the consumed power by the area differ by a large value the arduino will display these difference in the power reading on the LCD and the buzzer located in the KEB starts beeping indicating theft of electricity. As total Power losses equals transmission power losses plus distribution power losses.*

Keywords: automatic identification

I. INTRODUCTION

Sr. No.	Authors Name	Title of the Project	Description	Published Year
1	R Giridhar Balakrishna	IoT based Power Theft Detection	In order to prevent from power theft they used IoT system to detect the power theft and it is done by using Arduino	2022
2	Rhea Prakash	Power Theft Identification Using GSM Technology	The theft detection is done by using PIC microcontroller, sensor, GSM module and LCD display. As we know electricity theft is most commonly done by meter bypassing.	2021
3	N Kunan1, Poornima BK2	IoT Based Power Theft Detection and Monitoring System	They used smart energy meter which is connected at the starting of transmission line and one at the load side, the signals from both given to the Arduino	2020
4	Nilesh Mohite, Rinkuraj Ranaware	GSM Based Electricity Theft Detection	They presents global threat of power theft, this project provides good provision to reduce the illegal usage of electricity and also reduce the chances of theft	2020
5	Ajay Mahato, Abhishek Nanda	Electric Power Theft Detection and Location Tracking Using IoT	To overcome this global threat they present electric power theft detection and location tracking using IoT.	2019
6	Sagar Patil, Gopal Pawaskar	Electrical theft detection and Wireless meter reading	they are using digital meters, wireless data transmitter and power line communication to detect the theft in the power line.	2019
7	Chandan Kumar	Smart Meter Data Analysis for Power Theft Detection	In this proposed system there is provision for power theft is done by using ardunio uno controller, Smart energy meter and GSM technique	2018
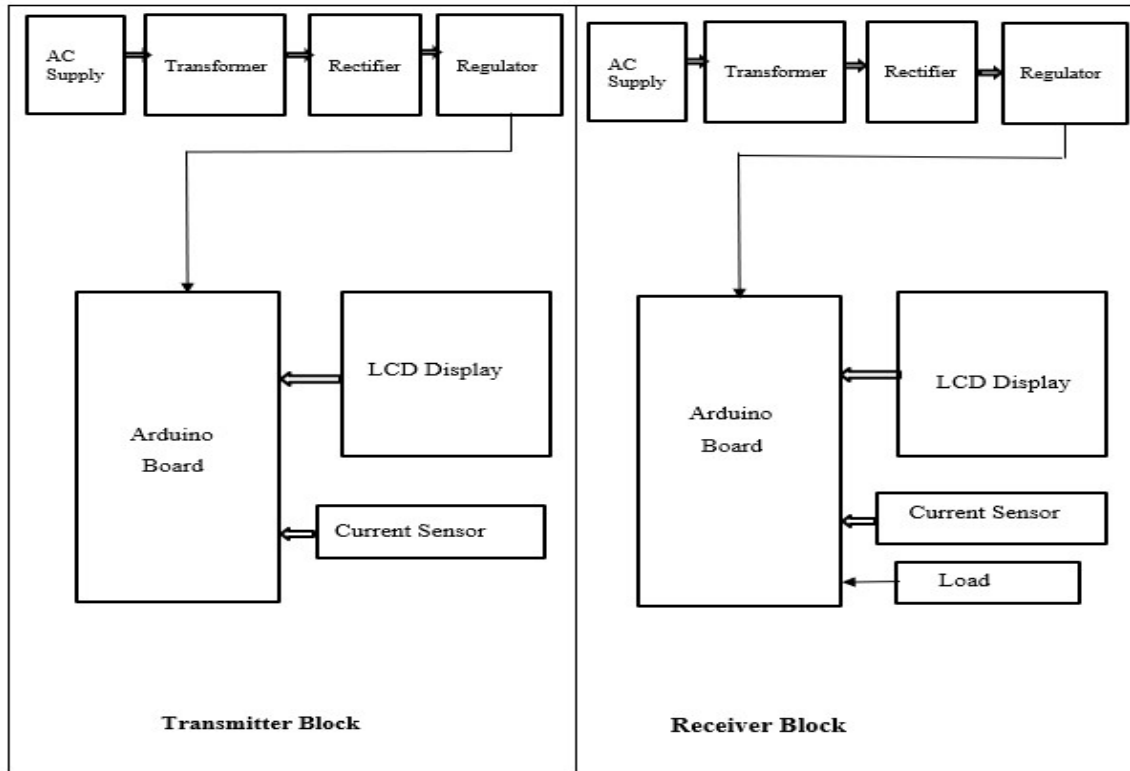
BLOCK DIAGRAM

WORKING

In our project there are two kits. One is power transmitter kit and another one is receiver kit. Both circuit have power circuit. Transformer step down the voltage 230 to 12v AC. This voltage rectifying by bridge rectifier. Ripple remove by 1000uf and filter the pulsating DC voltage. DC voltage regulated by 7812. The 12 volt require to trigger the buzzer. 7805 IC is use to convert 12 volt DC to regulated 5 volt. Arduino and LCD display work on 5 volt DC.

In both kit we are using Arduino Uno board as a main controller unit. Current sensing sense by current transformer . With the help of step up current transformer current read. This current in alternating current form. With the help of another bridge rectifier this current convert in Direct current. Capacitor is used as a filter. This current flows through 100 ohm resistor. So current convert in voltage This voltage is proportional to current which flows from respective current transformer. This voltage is given to analog pin of arduino.

HARDWARE REQUIREMENTS

- Arduino UNO
- Power supply
- Transformer
- Bridge rectifier
- Voltage Regulator
- Current transformer
- LCD display
- Resistors

- Capacitors
- Transistor
- Diodes
- LEDs
- Switches
- Buzzer
- Holder
- Bulb (Load)

ARDUINO

- The Arduino microcontroller is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market.
- The Arduino is open-source, which means hardware is reasonably priced and development software is free.

IMAGE OF DEVELOPMENT BOARD
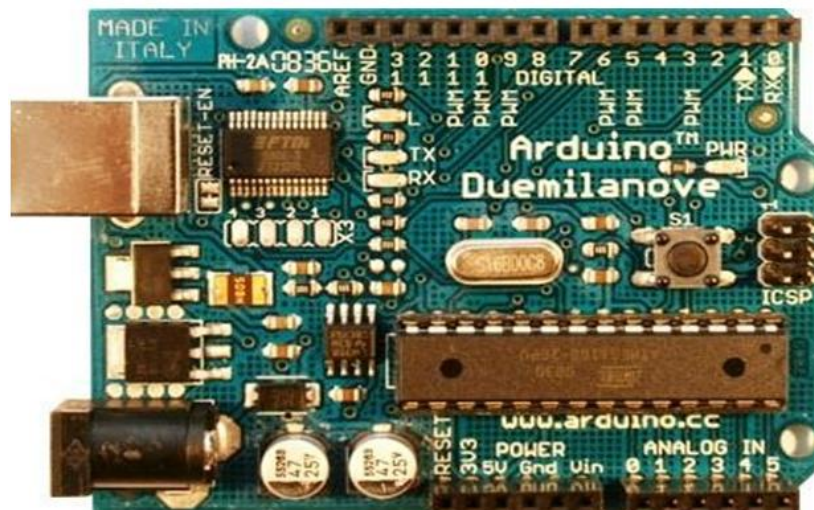
FEATURES OF DUEMALINOVE

- The Duemalinove board features an Atmel ATmega328 microcontroller operating at 5 V with 2 Kb of RAM, 32 Kb of flash memory for storing programs and 1 Kb of EEPROM for storing parameters.
- The clock speed is 16 MHz, which translates to about executing about 300,000 lines of C source code per second.
- The Arduino programming language is a simplified version of C/C++. If you know C, programming the Arduino will be familiar.
- If you do not know C, no need to worry as only a few commands are needed to perform useful functions.
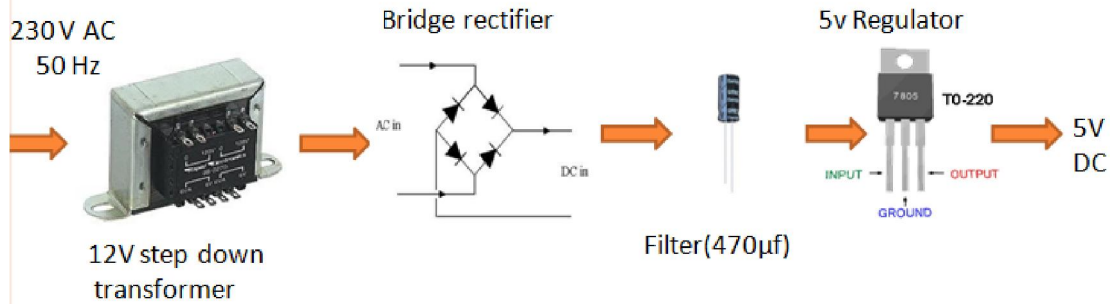
POWER SUPPLY
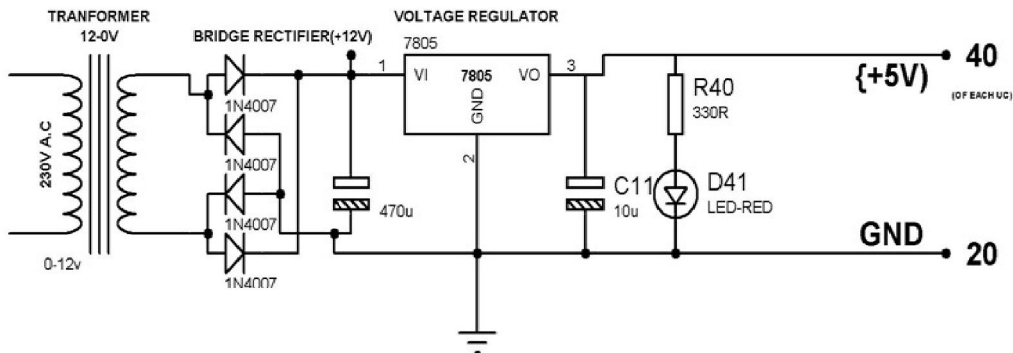
DESCRIPTION OF POWER SUPPLY

- The circuit uses standard power supply comprising of a step-down transformer from 230v to 12v and 4 diodes forming a Bridge Rectifier that delivers pulsating dc which is then filtered by an electrolytic capacitor of about 470microf to 100microF.
- The filtered dc being un regulated IC LM7805 is used to get 5v constant at its pin no 3 irrespective of input dc varying from 9v to 14v.
- The regulated 5volts dc is further filtered by a small electrolytic capacitor of 10 micro f for any noise so generated by the circuit.
- One LED is connected of this 5v point in series with a resistor of 330ohms to the ground i.e. negative voltage to indicate 5v power supply availability.

LIQUID CRYSTAL DISPLAY (LCD)

- Most common LCDs connected to the microcontrollers are 16x2 and 20x2 displays.
- This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.
- The standard is referred to as HD44780U, which refers to the controller chip which receives data from an external source (and communicates directly with the LCD.

BUZZER

- Piezo Buzzer Characteristics
- Wide operating voltage: 3~250 V
- Lower current consumption: less than 30 mA higher rated frequency
- Larger footprint
- Higher sound pressure level

SOFTWARE REQUIREMENTS

- Eagle
- Arduino programming language.

ADVANTAGE:

- Optimize use of energy .
- Automatic user identification.
- This method will reduce the energy wastage and save a lot of energy for future use

DISADVANTAGES

- Interruption of the power supply at the load during   operation .

APPLIANCES

- The system can be incorporated for almost all type of users.
- The concept is well suited especially for villages & interior areas.

II. CONCLUSION

The progress in technology about electrical distribution network is a non stop process. New things and new technology are being invented. The proposed system found to be little complex as far as distribution network is Concerne ,but it's an automated system of theft detection. It saves time as well as profit margin for utility company working in electrical distribution network. Utility company can keep a constant eye on its costumers.

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