

# SMS Based Current Theft Detector With Voice Output Using Renesas Microcontroller

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**Abstract-** In a country like ours, where there is desperate shortage of power, the power thieves are causing a great deal of loss in the Electric supply companies. Current theft means using electricity to drive appliances without it being monitored and hence obtaining it freely without the knowledge of the electric supply companies. One can just put a couple of leads, one from one of the phases and the other from the neutral. The other way is that one can just make sure that the disc of the energy meter does not rotate. This can easily done by attaching a heavy magnet the energy meter disc. However to do this it is required to remove the energy meter covers, which by the present law is an offence. Moreover, the Indian government is installing tamper proof meters. This is easily detected manually however. By using a single wire the input to the energy meter is connected to the output fuse. This bypasses the power to the energy meter as a result of which the energy meter does not record the energy consumption, however still supplies to the load. This calls for urgent need to detect and control the thefts. This project addresses this issue and also gives a cost effective solution.

**Keywords-** Renesas microcontroller, Opto coupler, current transformer.

## I. INTRODUCTION

This idea addresses this issue and also gives a cost effective solution. Theft of electricity is the criminal practice of stealing electrical power.

It is a crime and is punishable by fines and/or incarceration. It belongs to the non-technical losses. According to the annual Emerging Markets the highest losses were in India, followed by Brazil and Russia.

Nationally, total transmission and distribution losses approach 23% and some states losses exceed 50%. There are various types of electrical power theft, including Tapping a line or bypassing the energy meter. According to a study, 80% of worldwide theft occurs in private dwellings and 20% on commercial and industrial premises. It uses a Renesas

microcontroller and compares the energy meter reading signals.

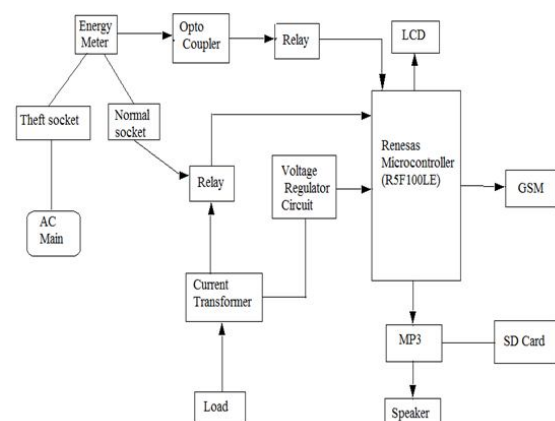
Using relevant preset conditions, the Renesas microcontroller will trigger.

This system detects by wireless, the energy theft at monitored meter number and also send message to the KEB station. This is a wireless system. In the first instance, it will detect the Power theft by power theft sensing circuit. The o/p of power theft sensing circuit is given to the Renesas microcontroller circuit, which modulate sensing signal and transmits. Energy meter is a device used to read the number of units of power being consumed. The output of this is then given to the Renesas microcontroller.

Aim and objectives:

- To replace the existing method with detection of current
- To save the current energy
- To reduce the current being theft.

## II. BLOCK DIAGRAM



### III. FUNCTIONAL DESCRIPTION

1. The function of energy used to measure the number of units how much we have make use from the supply of the KEB. Watt hour meter or energy meter is an instrument which measures amount of electrical energy used by the consumers. Utilities install these instruments at every place like homes, industries, organizations to charge the electricity consumption by loads such as lights, fans and other appliances. Basic unit of power is watts.
  2. An opt coupler or sometimes refer to as opt isolator allows two circuits to exchange signals yet remain electrically isolated. This is usually accomplished by using light to relay the signal. The opto coupler usually found in switch mode power supply circuit in many electronic equipment. It is connected in between the primary and secondary section of power supplies.
  3. A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts.
  4. Current Transformers transforms current at higher magnitude of current and high magnitude of voltage to current that is at a lower magnitude and much safer magnitude of voltage. A current transformer (CT) is a type of transformer that is used to measure alternating current (AC). It produces a current in its secondary which is proportional to the current in its primary. Current transformers, along with voltage or potential transformers, are instrument transformers. Instrument transformers scale the large values of voltage or current to small, standardized values that are easy to handle for instruments and protective relays. The instrument transformers isolate measurement or protection circuits from the high voltage of the primary system. A current transformer provides a secondary current that is accurately proportional to the current flowing in its primary. The current transformer presents a negligible load to the primary circuit.
  5. The output of the transformer is given to the converter circuit.
6. A liquid crystal display consists of an array of tiny segments (called pixels) that can be manipulated to present an information. Liquid crystals do not emit light directly instead they use light modulating techniques.
  7. Why the use of Renesas Microcontroller in the project?
    - Renesas microcontroller surpasses its predecessor i.e. 8051 family of microcontrollers, with various in-built features.
    - 2 .A few of the many features are mentioned below.
    - Renesas is a 16 bit microcontroller
    - Minimum instruction time can be changed from ultra-low speed (30.5us) to high speed (0.03125us).
    - 16 to 512KB of ROM and 2 to 32KB of RAM are available depending upon the series and number of pins.
    - On-chip high-speed (32 MHz to 1 MHz) as well a low-speed (15 KHz) oscillator is present.
  8. 10 bit resolution A/D converter (6 to 26 channels depending upon the series) Totally 3 UART for Serial Interface.
  9. Why Cube Suite+ IDE?
    - Integrated Development Environment (IDE) Cube Suite offers the ultimate in simplicity, usability, and security for the repetitive editing, building and debugging of codes.
    - Easy to Install and operate.
    - CubeSuite offers a highly user-friendly development
    - Environment featuring significantly shorter build times. The robust lineup of expanded functions and user support functions ensures a dependable environment for all users.
  10. The GSM ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world.

But in the converter circuit we make use of IN4007 AC to DC converter diode which converts AC voltage from the secondary of the transformer, the diodes IN4007 are arranged in the form of bridge rectifier to produce the DC voltage which is pulsating DC. To convert the pulsating into pure DC we make use of electrolytic filter capacitor (2200Mf), that generates pure DC voltage.

GSM differs from its predecessors in that both signalling and speech channels are digital, and thus is considered a second generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system. The ubiquity of the GSM standard has been an advantage to both consumers (who benefit from the ability to roam and switch carriers without switching phones) and also to network operators (who can choose equipment from any of the many vendors implementing GSM). GSM also pioneered a low-cost, to the network carrier, alternative to voice calls, the Short message service (SMS, also called "text

messaging"), which is now supported on other mobile standards as well.

#### **IV. CONCLUSION**

This idea model reduces the current being theft. Use of GSM in this system provide the numerous advantages of wireless network systems. There is a urgent for this kind of current theft controlling method

#### **V. ACKNOWLEDGEMENT**

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