



POWER THEFT IDENTIFIER AND ENERGY SAVER

**N.Karthi, C.Karthick Raja, B.Manimaran,
T.Maruthapandi, K.Prakash**
Department of ECE,
Arulmigu Palaniandavar Polytechnic College,
Palani, India.

B.Sudha,
Lecturer, Department of ECE,
Arulmigu Palaniandavar Polytechnic College,
Palani,India.

Abstract— Generation, transmission and distribution of electrical energy involve many operational losses. Whereas, losses implicated in generation can be technically defined, but transmission and distribution losses cannot be precisely quantified with the sending end information. Electrical power theft detection system is used to detect an unauthorized tapping on distribution lines. Implementation area of this system is a distribution network of electrical power supply system. Surviving systems are not able to identify the exact location of tapping. This system actually finds out on which electrical line there is a tapping. This is a real time system. Wireless data transmission and receiving technique is used. This will provide an additional facility of wireless meter reading with the same technique and in same cost. This will protect distribution network from power theft done by tapping, meter tampering etc. The project has developed for identify the power theft from power line and save the energy by automatic on/off the street light according to the time set of RTC. In the electric board power theft identifier system, we will be having a current transformer which transmits the signal to microcontroller with the use of signal conditioning unit. One Current transformer will be available in the main line and the other one will be in the house. The current reading of the main line will be sensed by the CT1 and the current reading of the house will be sensed by the CT2.

**KEYWORDS: PIC MICROCONTROLLER
PIC16F877A, CURRENT TRANSFORMER,
RELAY.**

1.INTRODUCTION

There are many operational losses in generation, transmission and distribution of electrical energy. Whereas, losses implicated in generation can be technically defined, but transmission and distribution losses cannot be precisely quantified with the sending end information. This illustrates the involvement of nontechnical parameter in transmission and distribution of electricity. Overall technical losses occur naturally and are caused because of power dissipation in transmission lines, transformers, and other power system components. Technical losses in T&D are computed with the information about total load and the total energy bill. While technology in on the raising slopes, we should also note the increasing immoral activities. With a technical view, Power Theft is a non -ignorable crime and at the same time it directly affected the economy of a nation. Electricity theft a social evil, so it has to be completely eliminated. Power consumption and losses have to be closely monitored so that the generated power is utilized in a most efficient manner. The system prevents the illegal usage of electricity. At this point of technological development, the problem of illegal usage of electricity can be solved electronically without any human control. The implementation of this system will save large amount of electricity, and there by electricity will be available for more number of consumer then earlier, in highly populated country such as INDIA. The project has developed for identify the power theft from power line and save the energy

by automatic on/off the street light according to the time set of RTC. In the electric board power theft identifier system, we will be having two Current Transformers. One energy meter will be available in the main line and the other one will be in the house. The current reading of the main line will be sensed by the CT1 and the current reading of the house will be sensed by the CT2. The amount of current consumption can be seen through the display. The LCD display will be provided for viewing both the current values of the main line and the house. The sensed output signal is given to the signal conditioning circuit and then to microcontroller. Now the microcontroller compares both these signals. If both the signal values are equal then there is no power theft is detected. If not the microcontroller detects there is a power theft and send a signal to alarm for identification. Even we can save the energy by automatic control of street light. We had store the set time of street light control by RTC. According to that time, the street light will on and off automatically.

II. PREVIOUS WORKS

In the existing methods wireless communication system of energy meter used with Zigbee, relay control and GPRS. The cryptographic method is used to secure the communication channel and Zigbee for the transmission of data in a serial process.

III. PROPOSED METHOD

In the electric board power theft identifier system, we will be having a current transformer which transmits the signal to microcontroller with the use of signal conditioning unit. One Current transformer will be available in the main line and the other one will be in the house. The current reading of the main line will be sensed by the CT1 and the current reading of the house will be sensed by the CT2. If theft occurs, the whole circuit will be cut-off. By using the reset pin, it will be turned on.

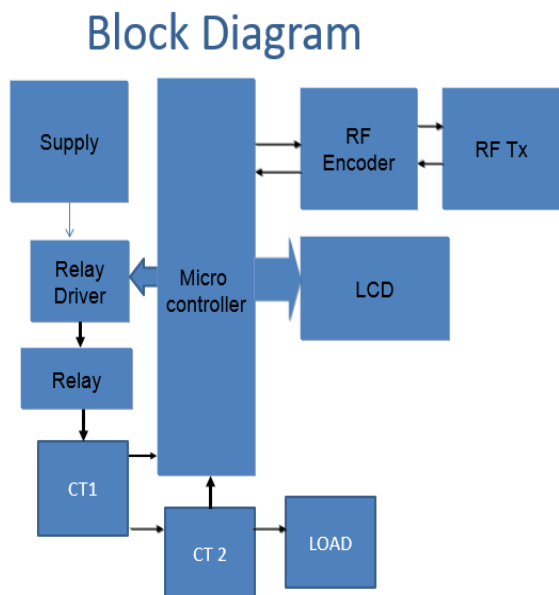


Figure 1. Block diagram of proposed system

IV. POWER SUPPLY

The input to the circuit is applied from the regulated power supply. The AC input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating DC voltage. So in order to get a pure DC voltage, the output voltage from the rectifier is fed to a filter to remove any AC components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant dc voltage.

V. CURRENT TRANSFORMER

Current Transformers (CT's) can be used for monitoring current or for transforming primary current into reduced secondary. Current used for meters, relays, control equipment and other instruments. CT's transform current isolate the high voltage primary, permit grounding of the secondary, and step-down the magnitude of the measured current to a standard value that can be safely handled by the instrument.

VI. PIC MICROCONTROLLER

The PIC is the main part of theft control. It is based on low power 16bit PIC16F877A processor. PIC consists of high performance and low cost of network technology. The memory organization of PIC consists of three memory blocks. The program memory organization consists of 13bit program count memory space. Data memory split into number of banks and it consist of GPR and SFR. The general purpose register file can be accessed in a straight line or in some way through the file select register. SFR is used in the processor and peripheral for controlling the system.

VII. RELAY

A **relay** is an electrical [switch](#) that opens and closes under the control of another electrical circuit. Here ULN 2003 Relay driver IC is used. It is a high voltage and current Darlington pair array based IC. It is used to control a high-voltage circuit with a low-voltage signal. It is used to control a high-current circuit with a low-current signal. E.g.(starter). To detect and isolate faults on transmission and distribution lines by opening and closing circuit breakers (protection relays).

VIII. CONCLUSION

The project “**POWER THEFT IDENTIFIER**” has been completed successfully and the output results are verified. The results are in line with the expected output. The project has been checked with both software and hardware testing tools. In this work “**CT, power supply, Relay, Relay Driver, RF Module and Microcontroller**” are chosen are proved to be more appropriate for the intended application. The project is having enough avenues for future enhancement. The project is a prototype model that fulfills all the logical requirements. The project with minimal improvements can be directly applicable for real time applications.

Thus the project contributes a significant step forward in the field of “**PUBLIC SAFETY**”, and further paves a road path towards faster developments in the same field. The project is further adaptive towards continuous performance and peripheral up gradations. This work can be applied to variety of industrial and commercial applications.

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