

ENERGY TAPPING IDENTIFIER THROUGH WIRELESS DATA ACQUISITION SYSTEM

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ABSTRACT

The project aims in designing an instrument for identifying the energy tapping directly from the grid system. Energy stealing directly from the main line is the major problem in our country, especially in rural areas lot of energy is tampered and our Electricity department doesn't have any appropriate instrument to detect exactly where the energy is looted. Therefore this project work is taken up for the benefit of state Electricity Department. The concept involved in the system is to measure the current flowing in the energy transmission line at sensitive areas, sensitive area is defined as where the transmission lines are passing very near to a village or passing over an agriculture field and people are tapping energy to run the pump sets. At these areas the current is measured with two CT's (Current transformers), these CT's are arranged at either side of the sensitive area, in series with phase. Now the current flowing through the CT primary is converted into digital and is fed to microcontroller. The controller displays the current in amps, since two CT's current is to be measured; two different systems are designed with two microcontroller units. One unit, which is supposed to be installed at starting point of particular zone, can be called as master unit. The other unit can be installed at other end of that particular zone, the current flowing through this unit Ct is transmitted in digital form. The master unit receives this data and displayed in LCD, the remote data acquired through Zigbee network is compared with master CT output and difference is displayed in separated row. The current flowing through both the CT's is almost equal, line loss is considered, whenever the energy is tapped between the two CT's, more current is passed through first CT, and the system is programmed such that when the difference is more than 3-4% approximately, system energizes the alarm automatically.

INTRODUCTION

The project aims in designing an instrument for identifying the energy tapping directly from the grid system. Energy stealing directly from the main line is the major problem in our country, especially in rural areas lot of energy is tampered and our Electricity

department doesn't have any appropriate instrument to detect exactly where the energy is looted. Therefore this project work is taken up for the benefit of state Electricity Department.

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PROPOSED SYSTEM

schematic diagram and interfacing of PIC16F876 microcontroller with each module is considered.



Fig 1: Schematic diagram of Energy Tapping Identifier Through Wireless Data Acquisition System

The above schematic diagram of **Energy Tapping Identifier Through Wireless Data Acquisition System** explains the interfacing section of each component with micro controller and energy meter. At the transmitting end transceiver is connected to pc through RS 232 cable and DB9 serial pin connector.

The crystal oscillator is connected to 9th and 10th pins of micro controller and regulated power supply is also connected to micro controller and LED's also connected to micro controller through resistors. An embedded system is a combination of software and hardware to perform a dedicated task. Some of the main devices used in embedded products are Microprocessors and Microcontrollers.

Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output. In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result.

The project “**Wireless energy meter reading and display on PC**” using PIC Microcontroller is an exclusive project that can be used

Advantages:

1. Automatic identification of power theft.
2. Very helpful for electrical department.
3. Alerts the electricity department if any tapping is done.
4. Continuous monitoring can be done on LCD Display.

Disadvantages:

1. Range of wireless communication is limited.
2. Alarm indication is for limited distance. (GSM technology can be used for longer range alerting)

Applications:

1. Can be implemented in real time to find the tapings.
2. Electricity department can use this for distribution lines.

The project “**Energy Tapping Identifier Through Wireless Data Acquisition System**” is designed such that it makes the electricity department to find out the tapings of high voltage bars easily without manually checking through the lines.

CONCLUSION

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

FUTURE SCOPE

Our project “**Energy Tapping Identifier Through Wireless Data Acquisition System**” is mainly intended to design a system which helps in continuous monitoring of energy taping of high voltage bars without checking manually through the line. This system has two current transformers connected to high voltage bars at two points. Current transformers (CT) are used to measure the current. Basing on the fact that the current flowing through the line is constant, the system continuously checks the current at each point and transmits this information to other system which compares the current at that point and alerts if there is an error rate above threshold through LCD display available in the system. For having this operation the Microcontroller is programmed using embedded ‘C’ language. Here, in the system Zigbee modules are used for wireless transmission whose distance is limited to around 80m. This project can be extended by using GSM module which overcomes the distance limitation of the system..

REFERENCES

The sites which were used while doing this project:

1. www.wikipedia.com
2. www.allaboutcircuits.com
3. www.microchip.com
4. www.howstuffworks.com

Books referred:

1. Raj kamal –Microcontrollers Architecture, Programming, Interfacing and System Design.
2. Mazidi and Mazidi –Embedded Systems.
3. PCB Design Tutorial –David.L.Jones.
4. PIC Microcontroller Manual – Microchip.
5. Pyroelectric Sensor Module- Murata.
6. Embedded C –Michael.J.Pont.