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"Electricity Theft Detection and High Alert SMS System Using GSM Module"

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ABSTRACT:- *Theft of electricity is the criminal practice of stealing electrical power. Theft of electricity is not only a loss to individual but it is loss to society and nation at larger.*
In the world Electricity theft is a major growing problem. Like many other developing countries India is alsovictim of electricity theft.To detect an unauthorized tapping on distribution lines the electrical power theft detection system is used.Electricity theft can be in the form of meter tampering, illegal connections, and unpaid bills. Implementation area of this system is at distribution network of electrical power supply system. It has always been a difficult task for the government of the and the Electricity Company to achieve their power theft activities.It deals with eliminating all these difficulties by a simple device to send a message whenever there is a power theft activity at a certain area. It will protect distribution network from power theft done in the particular areas.

KEYWORDS*-Tapping, meter tampering, Technical losses,Electricity theft.*

INTRODUCTION

Process of Generation, transmission and distribution of electricity involve many losses. Whereas, losses in generation can be technically resolve, but transmission and distribution losses cannot be quantified with the sending end information.Overall technical losses occur and are caused because of power dissipation of energy in transmission lines, transformers, and other components.

As per technical view, Power Theft is a not ignorable crime and at the same time it directly affects the economy of a nation.

Electrical power theft detection system is used to detect anunathorised tapping on distribution lines.This will protect distribution network from power theft done by tapping, meter tampering etc.Electricity theft causes increasing in load, decreasing in frequency increase traffic on legal consumerunnecessarily.

LITERATURE SURVEY

Electricity theft includes illegal tapping of electricity from feeder, by grounding neutral wire as it does not measures readings and avoid payment of bills. In early system there wasn't any device to detect theft over line so anyone can use electricity without purchasing it. The system stops the illegal usage of electricity.

[1] The theft of the electricity is the major concern of the transmission and distribution losses in the supply of the electricity worldwide. Theft also may occur by rewiring circuits to avoid an electric meter, or by tapping into another customer's electrical lines. Thispaper is aimed at reducing the heavy power and revenue losses that occur due to power theft by the customers. By this design it can be concluded that power theft can be effectively curbed by detecting where the power theft occurs and informing the authorities.

R.Sathish[2]statesthe idea of detection of power theft by using two current sensing parts one is Hall sensor and another one energy meter current measure current transducer.The proposed system will deliver continuous real-time monitoring of energy utilization, minimum energy loss and power theft detection. this system the service provider can get the immediate knowledge about the energy theft and passing to the concerned energy theft detecting squad.

Siddhartha S. &Ayush B. [3] states that losses due to power theft, experts say, are currently 29% of the total generation,whichequals a shocking □45,000crore in the fiscal year 2009-10.The system finds out the power theft by monitoring the total power consumption, receiving the delivered power data that includes data delivered to a number of users. Determining the amount of difference between them, thus finding out if power theft has occurred. But there lies no specific way to find out where the power theft has occurred.

BLOCK DIAGRAM

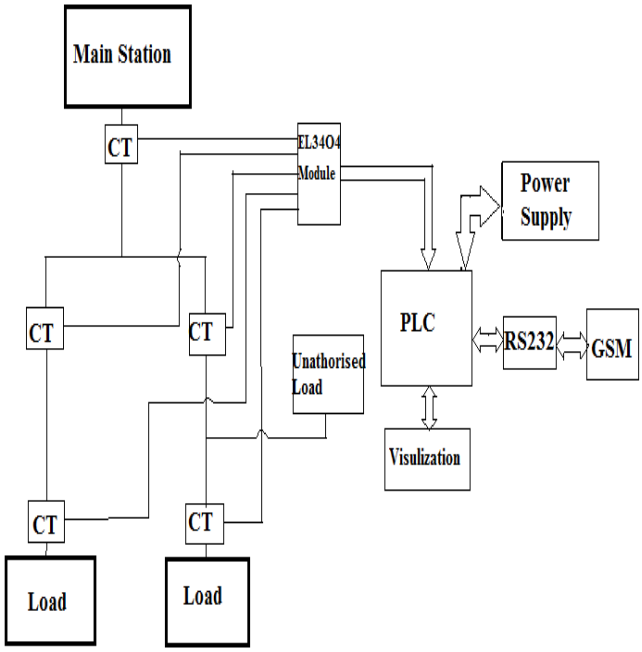


Fig.1Block Diagram

The block diagram consisting of PLC,GSM,RS232,EL3403the main station,

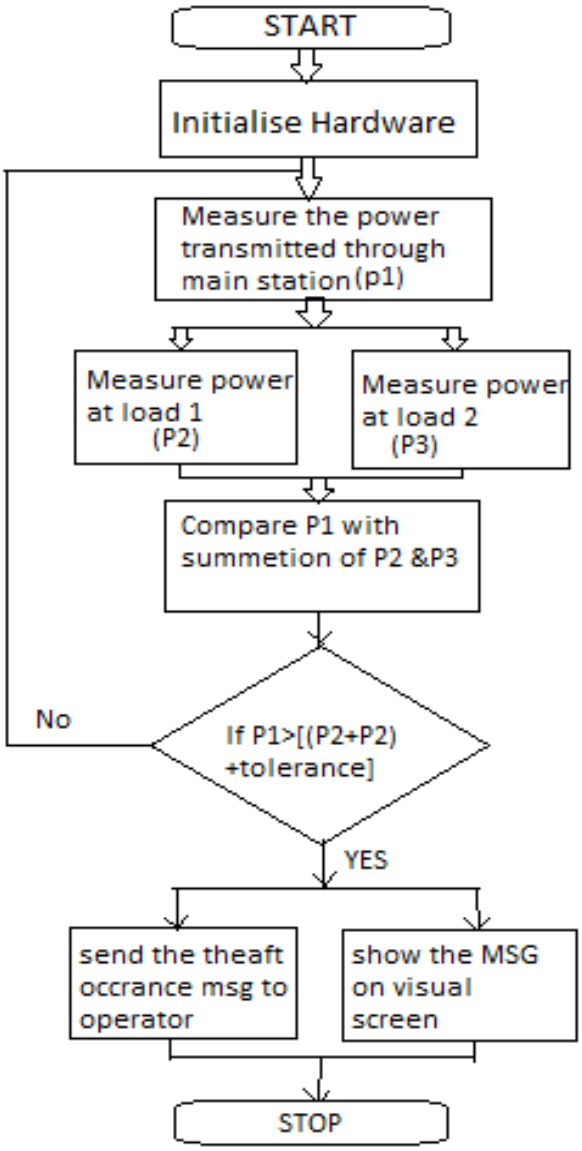
Two load station it also have current transformer. The supply of 24V is given to the PLC we can interface CT transformer with PLC via EL3403 module. CT is used to measure current, voltage, power and other parameter. The GSM is interfaced with the PLC via RS232.GSM is used to send high alert theft detection message to the operator who will going to take action against the theft .

We have connected CT at the main substation, at the starting of diversion point of electricity, and at the load, this current transformer s measure the current, voltage at the main station which is the actual power transmitted through main station of the electricity supplier and CT at load side measure the current , voltage consumed by the user like wise another CT at the consumer side also measure the current, voltages. This readings are given to the main station.as the main station and load station having some distance between them then there are some transmission losses in the conductor joining these stations so the at main station we compare the power transmitted through station and the summation of the powers at the load sides in comparison we have consider some tolerance due to the transmission losses. If by considering allowable tolerance the comparison is equal then no theft has occurred. And if comparison is not equal then theft has been occurred.

As we have connected the CT at the diversion point so we also compare the summation of diverted power with transmitted power and the load side power so we can come on final conclusion in which area or line theft has been occurred. And when is going to take then the alert message will send to the operator through the GSM and the alert message will shown on the visualization screen in the main station.

FLOW CHART

To program a PLC controller to detect a power theft on following flow chart as shown in fig



Flow chart of the system

Fig.2Flow Chart

PROGRAMMABLE LOGIC CIRCUIT

A programmable logic controller, **PLC**, or programmable controller is a digital computer used for automation of typically industrial electromechanical processes, such as control of machinery on factory assembly lines, amusement rides, or light fixtures. PLCs are used in many machines, in many industries. PLCs can range from small "building brick" devices with tens of I/O in a housing integral with the processor, to large rack-mounted modular devices with a count of thousands of

I/O, and which are often networked to other PLC and SCADA systems.

PLC CX9020

ProcessorARM Cortex™-A8, 1 GHz .

Internal main memory 1 GB DDR3 RAM

Power supply24 V DC

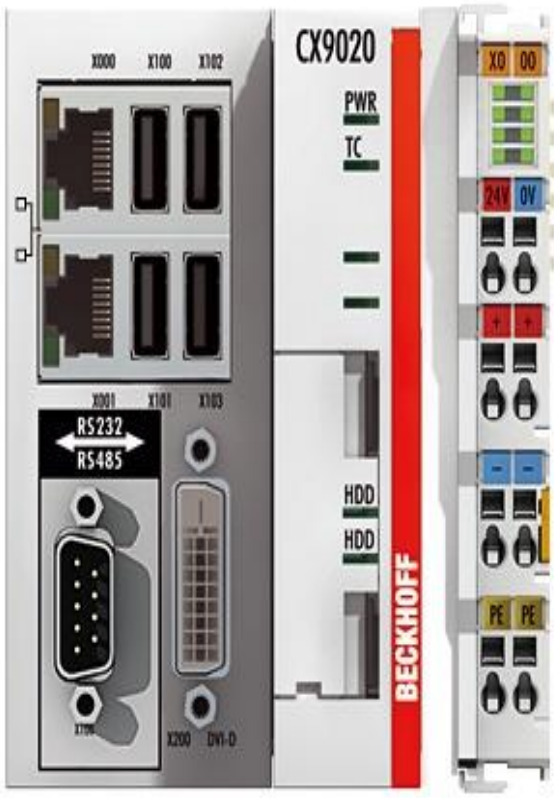


Fig.2 PLC CX9020

GSM Module

Product Features

- Dual-band EGSM900 and GSM1800
- Compliant to GSM phase 2/2+
- Output power:
- Control via AT commands
- Supplyvoltagerange5-25VDC

CURRENT TRANSFORMER

A currenttransformer (CT) is a transformer that is used to produce an alternating current(AC) in its secondary which is proportional to the AC current in its primary. Current transformers, together with voltage transformers (VTs) or potential transformers (PTs), which are designed for measurement, are known as **instrument transformers**

SOFTWARE

TwinCat 2.0/3.0
TwinCAT 3 highlights

- Only One Software For Programming And Configuration
- Visual Studio® Integration
- More Freedom In Selecting Programming Languages

CONCLUSION

This project can capable of detecting the electricity theft in various industrial and consumer area by measuring power at load and station side.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.

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