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ENERGY METER MONITORING AND THEFT DETECTION USING SCADA

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Abstract - *Energy theft is a very common problem in countries like India where energy consumers are constantly increasing as the population grows. Utilities in the power system disrupt annual revenue due to energy theft. Developing countries are far less productive in terms of electricity demand. In addition, the most common problem they face is a strange power outage. The collection of data allocation of billing power and monitoring of the distribution system is a very important part of energy perception research and energy analysis. Every year there is an increase in the number of power theft through domestic electricity connections as well as the availability of industrial electricity. If electricity is used illegally it will affect the country's economic situation. Insufficient energy levels, unpaid bills and theft of electricity are the most important factors in this massive energy loss. Many suitable solutions have been proposed for this problem but there is still a lot of progress to overcome this problem we will look at the current energy meter and its parameters, power, energy, etc. and control it with SCADA.*

***Key Words*: SCADA, Monitoring, Theft Detection, Real Time Billing, Automation, Energy Theft, Smart Meter, Energy Management.**

1.INTRODUCTION

Energy management and energy monitoring has a significant role for the proper utilization. Now a days energy emergency is the major difficulties that the world is facing. The best therapy for this is not the increases of energy production, but the actual use of energy availability. With the vast developmental changes that is overtaking the world, energy is the most essential utility required. Any crisis in the supply of energy would hamper the whole financial economy, thus monitoring and controlling power consumption starting at the domestic level is one of the best solutions. The most common problem in our country is theft of electricity. The population in our country is very high and the power theft is also rising day by day. Every year we are facing many domestic electricity thefts in industrial supply, that results in loss of distributed power to the supplier and because of which we are facing the continuous problems like power cut in rural and urban areas. In existing system the meter of each user needs to check to take the exhausted units and cost. This method may rise a some of issues, for instance, bungles caused by the meter of the users while creating the scrutinizing. In utility distribution system, electricity metering plays very important role, as it measures the electricity consumption of users and generates bill, which is a source of revenue.

2. LITERATURE SURVEY

Intelligent energy meter with advanced billing system and electricity theft detection in 2017.

Intelligent Energy Meter With Power Theft Detection in 2017.

Smart energy metering and power theft control using arduino & GSM in 2017.

Iot based smart energy meter monitoring, theft detection and disconnection in 2018.

GSM Based Electricity Theft Detection using Arduino in 2018.

3. BLOCK DIAGRAM

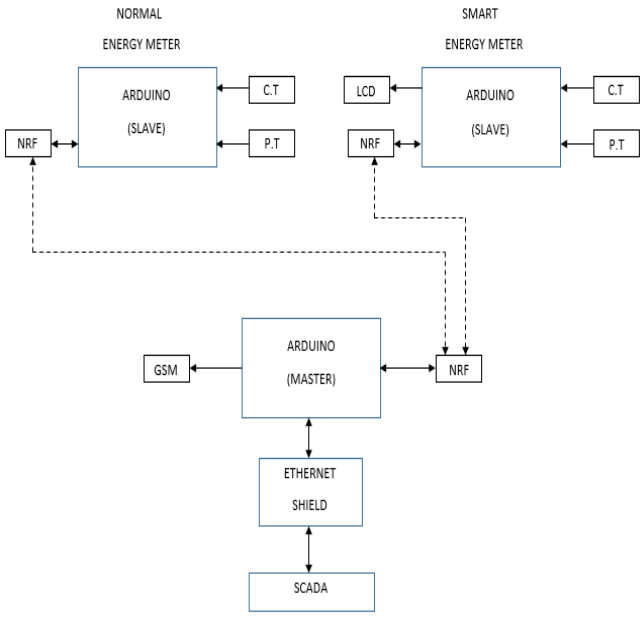


Fig - 1: Block Diagram

4. SYSTEM DESCRIPTION

4.1. HARDWARE

4.1.1. SMPS

The SMPS that used in the system has output of 5A and 5V i.e 25W.

4.1.2. CT

Current Transformer is used for current measurement. We have used ACS712 5A current sensor.

4.1.3. PT

We have used step down transformer of 230/6V.

4.1.4. RF MODULE

nRF2401 is a single-chip radio transceiver for the world wide 2.4 GHz ISM band.

4.1.5. ARDUINO

We have used Arduino Uno and Nano as controllers.

4.1.6. GSM MODULE

SIM800L GSM/GPRS module is a GSM modem, which can be integrated into a great number of IoT projects. You can use this module to accomplish almost anything a normal cell phone can; SMS text messages, Make or receive phone calls, connecting to internet through GPRS, TCP/IP, and more! To top it off, the module supports quad-band GSM/GPRS network, meaning it works pretty much anywhere in the world.

4.2. SOFTWARE

4.2.1. SCADA

SCADA stands for supervisory control and data acquisition, a computer system for gathering and analyzing real time data.

5. ADVANTAGES

5.1. Easy to Control

5.2. Theft location detection is very easy and accurate.

5.3. High Security.

5.4. More reliable and Efficient.

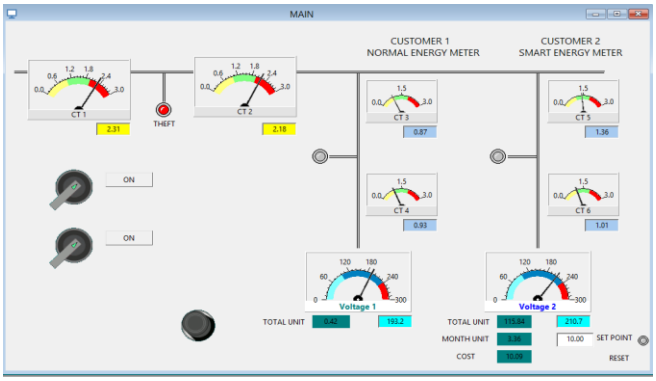
6. DISADVANTAGES

1. The range of RF module is limited.

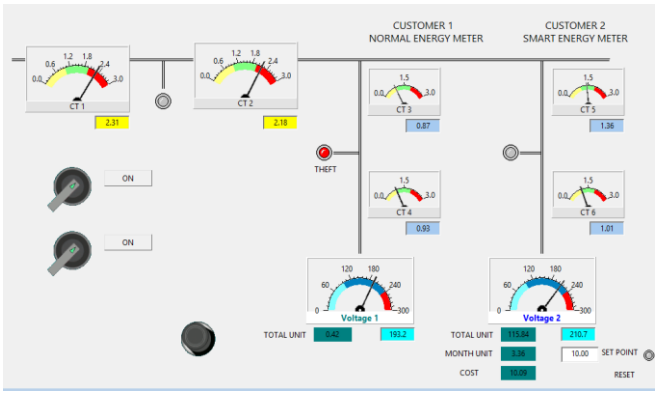
2. Capital cost is high.

7. RESULT

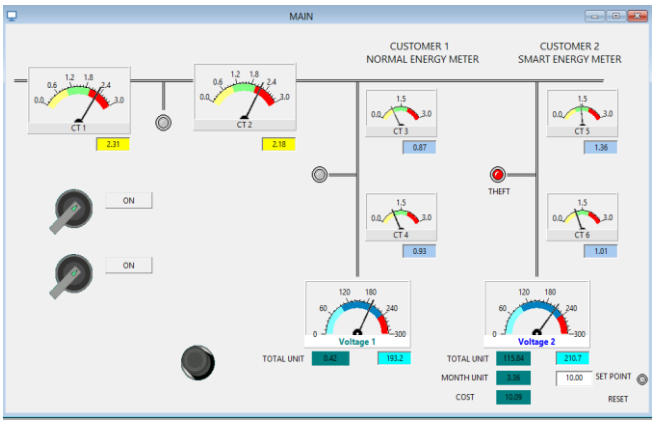
7.1. HOOKING THEFT



7.2. NORMAL METER THEFT



7.3. SMART METER THEFT



8. CONCLUSION

We have made highly efficient and reliable system to detect various theft and operator can take action by controlling the system, resulting in controlling the particular theft. System also gives special feature for betterment of energy management. The billing of individual energy meter is directly calculated and send to its owner from the system.

9. FUTURE SCOPE

1. Geographical Information System (GIS) can be used to gather, analyze and store data.

2. Global Positioning System (GPS) can be used by wireman to locate the theft from his phone.

3. Intelligent meter can be used which can interact with the consumer through touchscreen and voice.

10. ACKNOWLEDGEMENT

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