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Microcontroller Based Identifying the Power Theft from Power Line and Save Energy by Automatic ON / OFF the Light

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ABSTRACT: The project has developed for identify the power theft from power line and save the energy by automatic on/off the light. In the electric board power theft identifier system, we will be having current sensors which are fixed to the input line. One current transformer will be available in the main line. The current reading of the main line will be measured by the current transformer and the current reading of the house will be sensed by the IR sensor which is fixed to the energy meter. How much units the current gets consumed will 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. In this system power theft detection can also be made by sensing the data using sensors and then intimated to nearby station in order to caught the theft.

INTRODUCTION

The financial losses are critical to many electric power organizations. Lost earnings can result in lack of profits, shortage of funds for investment in power system capacity and improvement, and a necessity to expand generating capacity to cope with the power losses. Some power systems in worst affected countries are near bankrupt. Corruption increases and becomes entrenched as favors can be ‘‘bought’’ from power sector employees in the form of inaccurate billing and allowing illegal connections.

The employment of smart meters has only been made possible due to the evolution of digital electronics that allows the implementation of software in embedded hardware the loads were separated into linear and nonlinear according to their current phase angles. This separation was realized in order to demonstrate that the phase angle is an irrelevant attribute in the identification of nonlinear loads. The results obtained are satisfactory, but the method only identifies classes of loads.

Even the Minister for Population y resigned from her cabinet post on power theft charges. Electricity theft is a complex phenomenon with many facets.In this article, electricity theft is defined and various types of theft are described. The international scope and trends of theft will be examined.How theft can become institutionalized as part of the political, economic and managerial culture of governance will be noted. Lastly, some methods of dealing with the problem of electricity theft are examined.

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II. PROPOSED SYSTEM &EXISTING SYSTEM

2.1 .EXISTING SYSTEM

Electricity theft in its various forms can be reduced and kept in check only by the strong and assertive action of power sector organizations. The strategy and the action should be based upon a thorough understanding of the specific nature of the theft problem.

2.2PROPOSED SYSTEM

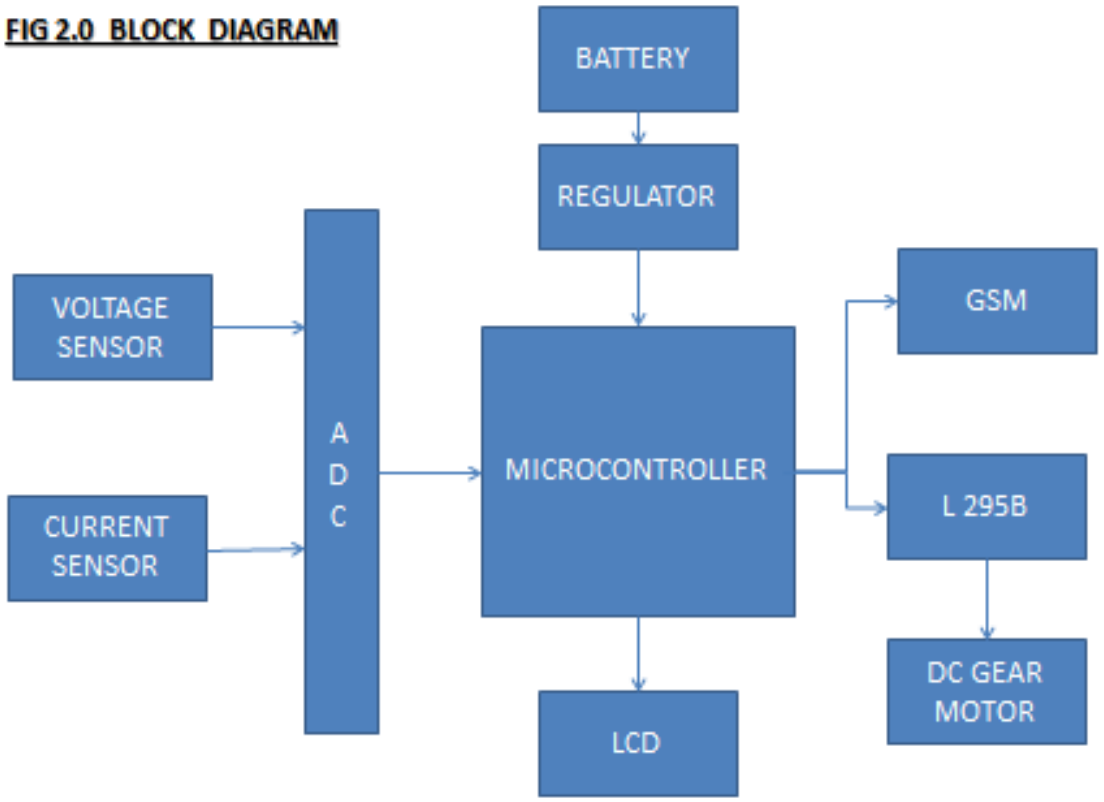
Beside this system power theft detection can also be made by sensing the data using sensors and then intimated to nearby station in order to caught the theft.

Similar to harmonic control, the voltage and current values and various parameters are sampled and send it to nearby station. So that by knowing the changes in value due to theft the system will get understand that there is theft. By using an alarm signal it is shown in station.

III. BLOCK DIAGRAM

3.1. BLOCK DIAGRAM

FIG 2.0 BLOCK DIAGRAM



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BLOCK DESCRIPTIONS

MC (MICRO CONTROLLER 89S52)
It is an eight bit micro controller works with 5 v dc, operates at 11.0592MHZ

VOLTAGE SENSOR
Voltage Sensors can be used to measure both DC and low-voltage AC circuits.

CURRENT SENSOR:
Current sensors provides economical and precise solutions for current sensing in industrial, automotive, commercial, and communications systems.

LCD DISPLAY
A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. It is utilized in battery-powered electronic devices as it uses very small amounts of electric power

POWER SUPPLY
The microcontroller consists of several circuits which have different operating voltage levels, this can because its out of control performance.

GSM
GSM/GPRS module is used to establish communication between a computer and a **GSM-GPRS system**.

MOTOR DRIVER L293B
The L293B and L293E are quad push-pull drivers capable of delivering output currents to 1A per channel. The power is used to drive the motor.

IV. MICROCONTROLLER

MICROCONTROLLER
INTRODUCTION
A microcontroller (sometimes abbreviated µC, µC or MCU) is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. Program memory in the form of NOR flash or OTP ROM is also often included on chip, as well as a typically small amount of RAM. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications.
Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes. Mixed signal microcontrollers are common, integrating analog components needed to control non-digital electronic systems.
Some microcontrollers may use four-bit words and operate at clock rate frequencies as low as 4 kHz, for low power consumption (milliwatts or microwatts). They will generally have the ability to retain functionality while waiting for an event such as a button press or other interrupt; power consumption while sleeping (CPU clock and most peripherals off) may be just nanowatts, making many of them well suited for long lasting battery applications.

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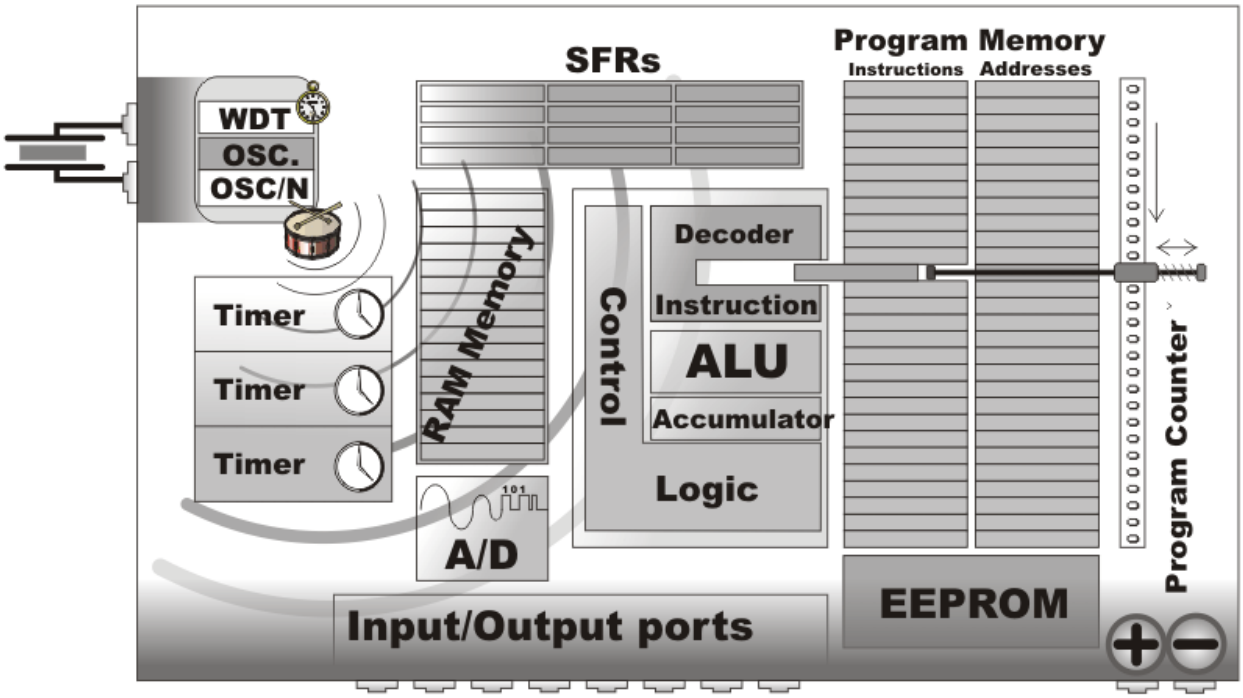
ARCHITECTURE



V. SOFTWARE TOOLS

SOFTWARE TOOLS

KEIL SOFTWARE

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.

PROLOAD

Proload is a software which accepts only hex files. Once the machine code is converted into hex code, that hex code has to be dumped into the microcontroller placed in the programmer kit and this is done by the Proload. Programmer kit contains a microcontroller on it other than the one which is to be programmed. This microcontroller has a program in it written in such a way that it accepts the hex file from the keil compiler and dumps this hex file into the microcontroller which is to be programmed. As this programmer kit requires power supply to be operated, this power supply is given from the power supply circuit designed above. It should be noted that this programmer kit contains a power supply section in the board itself but in order to switch on that power supply, a source is required. Thus this is accomplished from the power supply board with an output of 12volts or from an adapter connected to 230 V AC.

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VI. PCB&SOLDRING DETAILS

SOLDERING

This is the operation of joining the components with PCB after this operation the circuit will be ready to use to avoid any damage or fault during this operation following care must be taken.

1. A longer duration contact between soldering iron bit & components lead can exceed the temperature rating of device & cause partial or total damage of the device. Hence before soldering we must carefully read the maximum soldering temperature & soldering time for device.
2. The wattage of soldering iron should be selected as minimum as permissible for that soldering place.
3. To protect the devices by leakage current of iron its bit should be earthed properly.
4. We should select the soldering wire with proper ratio of Pb & Tn to provide the suitable melting temperature.
5. Proper amount of good quality flux must be applied on the soldering point to avoid dry soldering.

Construction:

Step in PCB designing

1. The circuit to be fabricated out is board through carbon paper on PCB sheet.
2. The carbon print is covered using permanent marker.
3. Make a solution of ferric chloride (fecl3) in tray.
4. Dip the PCB neatly in step 2 in the solution and mounting in continuously.
5. Continue step 4 until the copper (except under permanent marker).
6. Wash PCB with water, PCB is ready.
7. Drill the hulls so that the component can be mounted.
8. Mount the components.
9. Soldering in done make the final circuit ready.

Tips in follow while soldering

1. While soldering ics always keep temperature b/w 150-250c.
2. During the soldering of component keep the temperature B/w 250-350c.
3. Always take care that form does not get shorted while soldering.
4. Soldering should be thinner to be diameter.
5. For soldering use a soldering station is 10-25watt.

VII. ADVANTAGES AND APPLICATIONS

ADVANTAGES

- Maintaining maximum demand.
- To avoiding power theft.
- Improving efficiency of the power system

APPLICATIONS

- To detect the EB theft
- To detect the telephone line
- To detect the fiber optic cable

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VIII. CONCLUSION

The evidence points to the increasing levels of power theft in many countries and the financial losses for some systems are so immense that the utility is in financial Turmoil. Investment in improving the system and adding additional capacity cannot be undertaken, loans and payments cannot be met, and the consumer faces increased electricity charges. Even in efficient systems, theft losses can account for millions of dollars each year in lost revenue. Electricity theft in its various forms can be reduced and kept in check only by the strong and assertive action of power sector organizations. The strategy and the action should be based upon a thorough understanding of the specific nature of the theft problem. A strong case can be made that each power system (including consumer's attitudes and behavior) has its own unique qualities and only by knowing the system and the problem can effective solutions be designed and implemented. Since a high level of power theft is linked with corruption, the analysis cannot be confined to technical and managerial perspectives and needs to be multi-disciplinary in approach. Theft as an activity in some systems is closely intertwined with governance and with the social, economic and political environment. But it is an uphill battle to reduce the electricity theft rate drastically as long as extensive corruption continues. Reduction in power theft and keeping it within reasonable bounds is more likely to be successful in systems with a good governance culture. This is because the theft reduction mechanisms find a friendly environment for initiation and implementation. As part of generating and sustaining good governance in communities, electric power systems have the opportunity to take the lead in promoting sound corporate governance. The technological innovations make this task easier should the managerial skills and desire exist.

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