



# No More Power Shutdowns

G.A.Suganthan<sup>1</sup>, Krishnan<sup>2</sup>M.E Student<sup>1</sup>, Supervisor<sup>2</sup>Department of Electrical and Electronics Engineering  
Mahendra Engineering College, Mahendrapuri, Namakkal, India

## Abstract:

The vision of our paper is to create endured power supply for our India. The idea is to eliminate power shutdowns and to provide the basic necessity of power to the people, with certain limitations. Say one area is using 100kva power while the other uses nothing. If the 100kva power is split in to two and given to both the areas while power shutdown periods, the usage might be limited to 50% (while power shutdown periods only). The ratio can be changed according to the needs. This is done using a Micro controller, power transmission module and a GSM modem (used for communication) placed on each transformer. This paves way for equality in power distribution though out the nation. "If we can't do with electricity then we can do with less electricity".

**Keywords:** Endured power supply, Microcontroller, GSM, Power transmission module, Basic needs for people.

## I. INTRODUCTION

In our country, we don't have separate cables for industries and domestic. So now and then our country is suffering from frequent Power Shutdown which led to inconvenience to the routine life of the public and waste their money in buying generators, Uninterrupted Power Supply (UPS), etc. Today it's being seen in many newspapers that the duration of the power shutdown varies from one location to another (for example 8 a.m to 10 a.m in one area and 10 a.m to 12 noon in another area, etc). To solve this condition we have developed this project. By implementing our project the nation will not face any power cuts instead we can divide and provide the power to satisfy the basic needs. For this we are using a Microcontroller, Power transmission module and GSM is used for communication between the transformer and the electricity board..

## II. OBJECTIVE

The main objective of this project is to avoid the frequent power shutdown completely by limiting the power and to obtain the Utility bill reading, Voltage reading and power limitation in an effective and integrated manner using a Microcontroller, PTM and GSM per transformer. Current Transformer and two Electro Magnetic Switch (Relay or Contactor). During the power shutdown the Electricity Board department sends a message to the GSM integrated with the energy meter at a home and a microcontroller which is also integrated with it to watch the loads. The message will be the limit of power supply that is supposed to be provided during the power shutdown periods. If the load exceeds the limit it will 'Switch off' the main board of the home and ask the user to reduce the load. If so it will 'Switch on' the in board and continues its job. Like this all the houses are monitored and the power is limited.

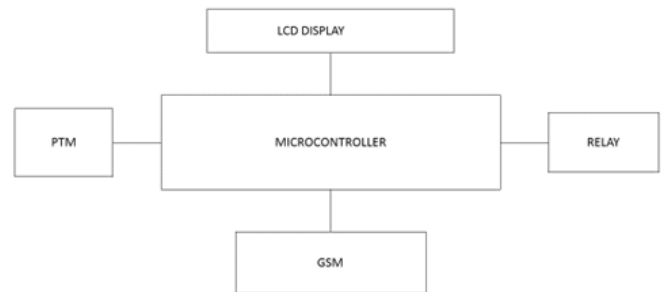
## III. BLOCK DIAGRAM

**Our proposed system consists of the following components:**

- Energy Meter-Analog Meter.
- Microcontroller-PIC 16F877A.
- GSM MODEM.

- AD Converter.
- Current Transformer.

The block diagram of our project is shown in the Figure 1.1.



**Figure.1. Block Diagram**

## MICROCONTROLLER

Microcontroller is the control unit of the system. The microcontroller used in our project is PIC16F877A. All the instructions are stored in the system. The components which are integrated with the Microcontroller are GSM Modem, Energy Meter, and AD Converter.



## GSM MODEM

GSM modem is used at the transmitter end. A GSM modem is a wireless modem that works with a GSM wireless network. GSM SIM card is inserted into this modem, and the modem is connected to the microcontroller. GSM modem supports a set of AT commands. With the help of these commands we can send SMS and alert to the required destination.



## ENERGY METER

An energy meter is a device that measures the amount of electrical energy supplied to or produced by a residence, business or machine. The most common type is a kilowatt hour meter. When used in electricity retailing, the utilities record the values measured by these meters to generate an invoice for the electricity. They may also record other variables including the time when the electricity was used.



## ADC

An analog-to-digital converter is a device which converts continuous signals to discrete digital numbers. Typically, an ADC is an electronic device that converts an input analog voltage (or current) to a digital number. However, some non-electronic or only partially electronic devices, such as rotary encoders, can also be considered ADCs.

## IV. WORKING

This project consists of a Micro controller, power transmission module and a GSM modem. The Microcontroller is programmed in such a way to switch on/off the contactors as per to the received Short Message Service [SMS] commands.

In spite of the Energy Meter interfaced with the Microcontroller, the data such as current, volt and units can be read by the microcontroller. Whenever Electricity Board department needs the power shutdown, the Electricity Board department has to just send Short Message Service [SMS] to the Global System of Mobile Communication [GSM] module. It's known that the Short Message Service [SMS] can be sent to multi-user by using Personal Computer. Consider the Short Message Service [SMS] content is, "Allow 30%". This Short Message Service [SMS] is received by the GSM module and the Short Message Service [SMS] content data is transferred to the Microcontroller and it compares the data received by the GSM module and the data from Energy meter. If the Energy meter data is greater than the GSM module data then microcontroller cutoff the contactor or relay. If the Contactor is off there won't be power. In such condition the user has to reduce the loads and reset to get the power again. So more than the limited power the user couldn't able to use. After the determined period of power shutdown by the EB department, the Electricity Board department sends another Short Message Service [SMS], if the content of Short Message Service [SMS] is, "Allow 100%". Likewise Microcontrollers receive the data and cancel its limitations. Similarly for different type of Short Message Service [SMS] from the Electricity Board department to individual users and the reply Short Message Service [SMS] is sent back from the user to the Electricity Board department. By this way we could even have electricity schemes the electricity can be made as flexible as a rubber thanks to this project.

## V. ADVANTAGES

- No more power shutdowns
- Various power schemes
- Automatic or direct EB bills
- Lots of businesses can be saved by this project
- Growth in the economy of the nation
- Low cost system
- The minimum power necessity is fulfilled

## VI. CONCLUSION

By implementing this project we could make our country free from power cuts. The basic necessity of power can be supplied to everyone. As in the abstract we could bring equality in power distribution. We have the technology and great ideas now it's in our hands whether to use these for the welfare of the nation.

## VII. REFERENCES

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