

## Remote Power Distribution System Using GSM

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**Abstract** - Remote power distribution system using GSM aims to design and implement cost efficient and cost effective solution for exchange the manual process of power cut/load shedding from a focused location. It consists of GSM modems, one at the control station and the other one connected to the sub station from where the energy is divided into certain are Here the control station modem put's GSM network to turn a branch line of a sub station either on/off. It also consists of a LCD display which displays the state of the channel/subdivisions of the sub station as either on/off. In case of network non action, a set of manual switches are also there to turn on/off the channels manually. Electromagnetic relays are used as circuit destroyer. [1]

**Keywords** - Control Station ,GSM, LCD, Load Shedding, Power Cut, Relay, Sub Station

### 1.Introduction

Power cut or load shedding is a common process in countries where the industry of electricity is less than the total demand. To balance the availability and the requirement of electricity a afraid authority has to execute this process. This process is prone to human errors as an operator has to manually switch the channel on/off. If we can design an efficient solution to perform this operation remotely from a centralized location, we will be able to replace the manual system with a refined centralized remote system[1]. "Remote power distribution applications of the GSM technology which has fully covered almost all areas of the world. This helps in loss the execution and also makes it simpler and easier to install the GSM system both at the controller and transformer side. GSM is a broad area radio communications system that uses digital radio transmission to provide voice, data, and multimedia communication services[1]. It numbers the communication between mobile telephones (mobile stations), base stations (cell sites), and shift systems. We have selected a GSM modem named quad band Fargo 900/1800 Hz for our use. The messages are sent from the mobile set that contain commands in written form which are then processed consequently to perform the required task. The planned approach for designing this system is to implement micro-controller based control module that receives its instructions and command from a cellular phone over the GSM web. The micro-controller then will carry out the periodical commands and transfer the control to electromagnetic relays which acts as a circuit breaker. First, the sent SMS is stored and query from the control station modem. Then, the required control signal is made and sent to the modem of the base station. This signal is interpreted by the micro controller module and instruction is given to the hardware i. e. relays which

perform the action of turning on/off of the substation channels.

### 2. Literature Survey

Electricity is the on of the human need .We cannot believe human life without electricity. But in India the production of electricity is less than its use so, our electricity board plans the load shedding schedule for some areas. Sub stations are periodically cuts the power of certain areas as per the time table. Many times due to reasons like heavy rains, fires in schools, colleges, industries the emergency cutting of electricity text place. There is no present system available which automatically controls the power from centralized location. The systems now a days we are using is totally manual which contains many human errors. Proposed system: The cutting the electricity is done manually still no such system in use which automatically cuts off the electricity as per need. Due to manual cut the more human power requires, some limitations comes in it due to the human capabilities & limitations. So we are presenting a system which does this work automatically overcomes the errors present in old system.

1] Title-Automatic Power Meter Reading System Using GSM Network

Author's- H.G. Rodney Tan, C.H Lee and V.H Mok

Publication- H.G. Rodney Tan, C.H Lee and V.H Mok ,

Automatic Power Meter Reading System Using GSM

Network, The 8th International Power Engineering

Conference(IPEC2007).Web.30November2010

Technique-3-D DWT

Advantages - It has 25% frame drop. Less variance in results

Drawback-In this only 300 frames are used.

2] Title- Pre-paid Energy Meter Using AVR Micro-controller

Author's- IrfanQuazi, Sachin Kumar Gupta and Rajendra Prasad

Publication- IrfanQuazi, Sachin Kumar Gupta and Rajendra

Prasad , Pre-paid Energy Meter Using AVR Micro-controller (2008)

Technique- Discrete wavelet transform and Discrete cosine transform.

Advantages-Good PSNR Values

Drawback- Incognizable (Perceive)

### 3. Problem Statement

It consists of the power supply section, the micro controller, the GSM modem, LCD display, manual keypad, relays, relay driver unit and transformer in the substation part and a PC/Laptop and a modem in the control station part. The GSM modem in control station sends signals to the micro-controller via GSM modem that sends signals to the relays to turn on/ off the channel. The status of channel (on/off)

of a particular The LCD is used to display the status of the channel of the substation.

#### 4.Existing System

Power cut or load shedding is a common process in states where the industry of electricity is less than the total requirement. To balance the availability and the requirement of electricity a concerned authority has to execute this process. This process is prone to human errors as an operator has to manually switch the channel on/off. If we can design an efficient and economical solution to perform this operation remotely from a centred location, we will be able to renew the manual system with a sophisticated centralized remot Microcontroller e system. "Remote power distribution the emerging applications of the GSM technology which has fully covered almost all areas of the world. This helps in loss the execution cost and also makes it simpler and easier to install the GSM system both at the controller and transformer side. GSM is a wide area radio communications system that uses digital radio transmission to provide sound, data, and transmission communication services. It arranges the communication between mobile telephones (mobile stations), base stations (cell sites), and change systems. We have selected a GSM modem named quad band Fargo 900/1800 Hz for our use. The messages are sent from the mobile set that contain commands in written form which are then processed accordingly to perform the required task. The proposed coming for design this system is to implement microcontroller based control module that receives its instructions and command from a cellular phone over the GSM network. The microcontroller then will carry out the issued commands and transfer the control electromagnetic relays which acts as a circuit breaker. First, the sent SMS is stored and enquiry from the control station modem. Then, the required control signal is made and sent to the modem of the base station. This signal is interpreted by the microcontroller module and instruction is given to the hardware i.e. relays which perform the action of turning on/off of the substation channels transformer is showed on the LCD. The messages are the commands which is interpreted by the microcontroller and accordingly it instructs the relay driver. The microcontroller is programmed such that the channel when it is on /off the status is displayed on LCD screen. A separate set of manual keypads are also provided as a precaution in case of GSM network failure. The GSM modem is responsible for establishing communication between base station and transmission end and fetching commands.

#### 5.Proposed System

Designing an efficient and cost effective solution for replacing the manual process of power cut all problem related to power distribution by remotely controlling from a centralized location. To efficiently control the on/off of transformer via SMS. Minimize power and time wastage.

Eliminate the need of being physically present in any location for tasks involving the operation.

#### 5.1.Block Diagram With Explanation

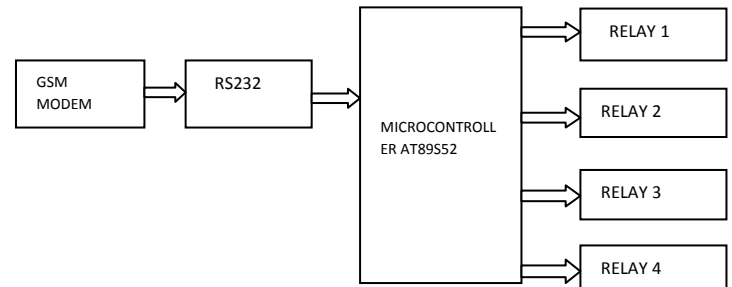


FIG.1 Sub-Station

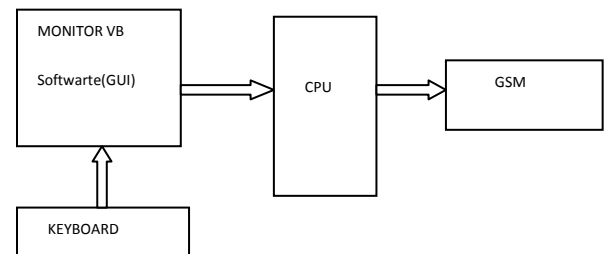


FIG.2 Control System

#### 5.2. Sub station :

Sub station is the part from where the power gets distributed to the different zones. It receives message from the control station and forward this message to the micro-controller

#### 5.3. GSM module :

It is the Global System for Mobile used for communication purposes between the control station and the sub station. here it is receiving the message from the control station. [2]



#### 5.4. Micro-controller :

Micro-controller is the programmed device which takes an appropriate action after the control message received from the sub station. It instructs to the relay driver that which channel has it wants to turn on or off [4]

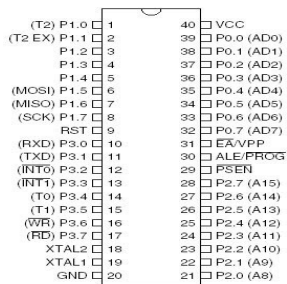


FIG.4 Micro-controller AT89S52 IC

**5.5. Relay drive:** It is used for to drive the four relays used in our system. It is interfaced with the micro-controller so that receiving commands from the micro-controller.

**5.6. Relays :** Relays are used for the switching purposes. It switch the on or off power of the different zones

**5.7. RS232:**As zigbee is used in this system for signal transmitt we require RS232. RS232 is one of the most commonly used serial protocol. it can be operated via the DB9 port,DB25 port or the USB port well. There are several logic level families, and we are concerned with TTL and RS232.

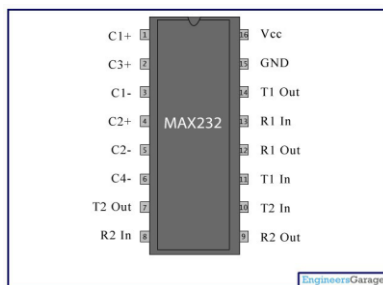


FIG.5 RS232 IC

## 7. Application

1. in industries
2. in housing complexes where load shedding problem can be controlled remotely which saves both time and cost.
3. System can be installed on centralized sub station from where the power are distributed to different zones.
4. Can be used in organizations, schools, colleges to monitor & control the power.
5. Can be monitor small zones as well as large number of zones. So, can be used in small rural areas as well as in large cities.

## 8. Future Scope

1. The Preset system can detect power theft from centralized location so that the efficient control of power can be possible
2. If any fault occurs at any zone the status is directly displays at the substation.
3. By sending simple info message to the GSM located at the centralized location the MSEB gets the all the

information about which zone has facing the problem of the load shedding

4.Can control the usage of electricity from the central location.

## 9. Conclusion

There is a lot of decrease of power due to uneffective consumption of electricity by consumers. The system we have designed has many applications in industries, schools and colleges, housing complexes where load shedding problem can be controlled remotely which saves both time and cost. Human mistake is also reduced. Moreover, this design can also be used to pre schedule power cut for large areas so that total load shedding hours can be reduced. Our system presents an inexpensive GSM based interactive control system. A number of literatures related to the topic of control systems and automation were reviewed and analyzed. According to the planned system, the host can be any cell phone and the customer is a controller based on Atmel AT89S52. The controller is connected to a GSM modem through an RS232 cable. The paper provided explanation of the circuit diagram of the proposed system. [6]

## 10. References

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