



Load Shedding time management by programmable interface

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ABSTRACT

The project is an automatic load operation system that controls load operation, multiple numbers of times according to programmed instruction. The project eliminates the manual ON/OFF switching of load. A real time clock (RTC) is used to track the time and automatically switch ON/OFF the load.

This project is required for load shedding time management which is used when the electricity demand exceeds the supply and there comes a need for manually switching ON/OFF the electrical devices in time.

Hence this system eliminates the manual operation by automatically switching the load ON/OFF. A matrix keypad is interfaced with the microcontroller from where the specified time is input to the microcontroller.

When this input time equals to the real time, based on the commands the microcontroller initiates that particular relay to switch ON/OFF the load. The time is displayed on a seven segment display.

1. INTRODUCTION

It is very important to shed the Load of some zones to meet the demand of other zones and providing next time to those which were shed before The stable condition is defined as the power generated by the system must be completely utilized in running and remaining in losses so that equation may become valid. $\text{Reserved power} + \text{power generated} = \text{System Running power} + \text{losses}$. But the problem may arise if there is an. Since, till now, Load Shedding was done manually but if done using "Programmed devices" to control, it may prove more efficient. The reason is that the entire substation can be controlled by a single controlled substation and command can be transferred from single centered substation to ease the work of different person. The control of various feeders, substation, Distribution

Transformer and Various distribution Points are not easier to control at a time, therefore to meet this problem a single centered station designed with Programmable Load shedding system to operate them all from a single location. The problem of theft can also be reduced by a very great margin because it completely closes the power to a specific zone. Thus, after completely cutting the power from a particular zone, no one can access power from any other nearby locations under the restricted zone, but with manual handling at substation people try to steal the connection from other active connections of nearby zone but when this new technology is employed, it completely cuts off the total power available in that zone.

2.RELATEDWORK

There are numerous works that have been done related to image processing machine learning algorithms. There are number of mainstream groups of microcontrollers which are utilized as a part of various applications according to their capacity and attainability to play out the coveted errand, most normal of these are 8051, AVR and PIC microcontrollers. In this we will present you with AVR group of microcontroller.

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3.COMPONENTS

a.MICROCONTROLLER

The computer on one hand is intended to play out all the universally useful errands on a solitary machine like you can utilize a computer to run a product to perform estimations or you can utilize a computer to store some media record or to get to web through the program, while the microcontrollers are intended to perform just the particular undertakings, for e.g., turning the ac off naturally when room temperature drops to a specific characterized confine and again turning it on when temperature transcends as far as possible.

b.MATRIXKEYPAD

A keypad is a set of buttons arranged in a block or "pad" which usually bear digits, symbols and usually a complete set of alphabetical letters. Keypads are a part of HMI or Human Machine Interface and play really important role in a small embedded system where human interaction or human input is needed. Matrix keypads are well known for their simple architecture and ease of interfacing with any microcontroller

c. RELAY

A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a

circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.

d) SEVEN SEGMENT DISPLAY

The segments themselves are identified with lower-case letters "a" through "g," with segment "a" at the top and then counting clockwise. Segment "g" is the centre bar. In addition, most displays are actually slanted a bit, making them look as if they were in italics. This arrangement allows us to turn one digit upside down and place it next to another, so that the two decimal points look like a colon between the two digits. The technique is commonly used in LED clock displays.

e. RTC (REAL TIME CLOCK)

The DS1307 serial real-time clock (RTC) is a low-power, full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially through an I²C, bidirectional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information. The end of the month date is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with AM/PM indicator.

The DS1307 has a built-in power-sense circuit that detects power failures and automatically switches to the backup supply.

Timekeeping operation continues while the part operates from the backup supply.

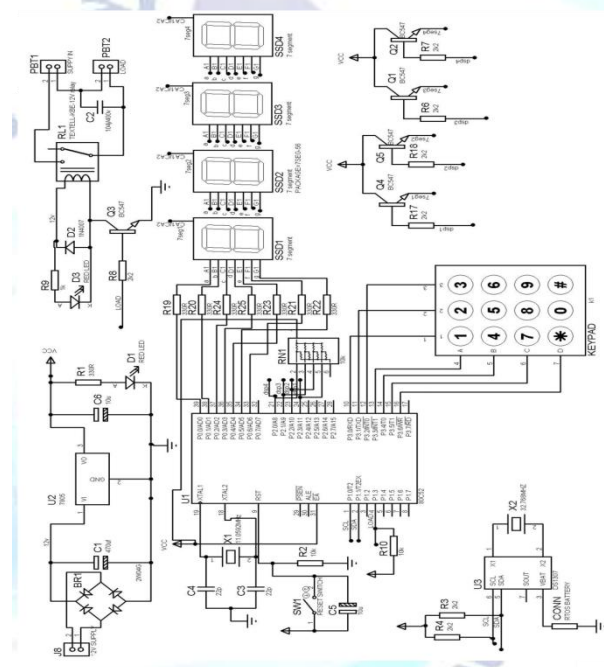
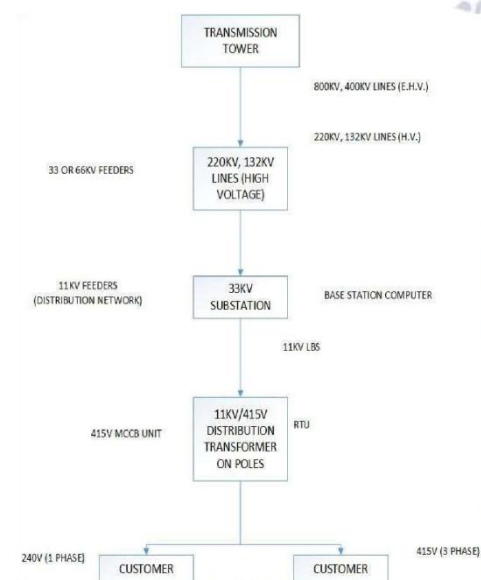
4. METHODOLOGY

In power generating station the electric power is generated at 11KV, 50Hz. Before transmitting the power over long distances, the power is stepped-up to 400KV, 220 KV to reduce the power losses while transmission. A high voltage line of transmission network is used to transmit the power. Normally, the voltage lines which are used for transmission are installed in hundreds of kilometer and it delivers the power into the grid. A sub transmission network of 33KV, 66KV lines is used for the connection of the load to the grid. Then the voltage is stepped down to 11KV at the substation for the purpose of power distribution to load points through the transmission lines of 11KV and lower. The

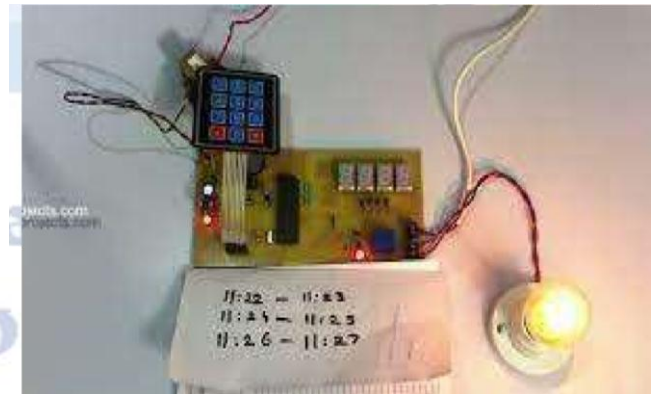
microcontroller gives command to the relay which turns on the electrical load as the set time is equal to the real time. Then give the next command to turn off the load as per the program. The biggest advantage of this project is the multiple on/off time entries which makes the system more flexible. The system load is continuously observed by measuring the input rates and the load level on each server is also estimated accordingly.

5. BLOCK DIAGRAM

The following diagram makes it easier to understand how to process



6. PROJECT MODEL



7. OBSERVATIONS

S.NO	FROM	TO	OUTPUT
1	*12:01#	*12:02#	ON
2	*12:02#	*12:03#	OFF
3	*12:03#	*12:04#	ON
4	*12:04#	*12:05#	OFF
5	*12:05#	*12:06#	ON
6	*12:06#	*12:07#	OFF

8. FUTURE SCOPE

This project could be further extended in which the distribution point can be monitored by one central location. The supply of concerned geographical region is cut off using relays through circuit breaker. In this system to read the remote electrical parameters, user can send commands to concerned DP. This system can send the electrical parameter data like active power, reactive power, current, voltage, frequency etc., in the form of SMS to the user when relay trips. In this type of power system sensors are used to communicate with the microcontroller. Internal memory in the microcontroller helps to hold the assembly code. . Some set of assembly instructions are dumped into the controller using internal memory. Assembly instructions are very important as the operation of the micro-controller is completely dependent on these instructions. This proposed system might takeover manual efforts for controlling the load shedding time break by sending SMS. Power supply cut off of specific zone can be done by just sending an SMS to the concerned Distribution Point from a central point .When the electrical parameters overdo the predefined values these relay will be activated.

9.CONCLUSION

The paper presents the programmable based load shedding system helps in improving the quality and stability of power system. The technologies and infrastructure are designed to be in place and will take care of all the challenges and vulnerabilities of automatic load shedding system. The system is technically feasible therefore nothing should prevent the transition into the smart load shedding system.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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