



IOT BASE SMART GRID & FEEDER LOAD SHEDDING SYSTEM

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ABSTARCT - Demand side load management is a powerful solution to meet the rapidly increasing energy demand. It stabilizes the generation and demand by keeping the electricity use taken care of. This deal with the heap and power use by feeder coordinating direct burden control program with savvy metering framework. A ready framework is intended to recognize the moments of expansion in agreement interest. Power shoppers are given choices to pick load decrease or punishment preceding utility activity. This approach prompts dynamic support of buyer in direct burden control which was before a utility driven method. The global service for mobile based system is used to notify the consumer to act according to the loading condition hence, the technique provides consumer based load scheduling for energy efficient and cost effective load management. Practical realization of the proposed scheme is accomplished using Arduino controller, relay modules, energy meter enabled with RS-485 port, MAX-485 and esp32.

Index Terms—Demand side management (DSM), smart energy meter (SEM), direct load control (DLC).



I. INTRODUCTION

1.1 Problem statement

In INDIA we are currently uses the manual method of load shedding where the feeders are put now and again by squeezing their control turns on the control board. This strategy has a ton of difficulties. Feeders for certain areas might be expected to the disservice of others by allotting additional opportunity to them.

The regular on and off activity can prompt mileage of the framework parts and the presentation of human mistakes in the estimation of how much burden to be permitted on at a specific time span can very challenge. The Intelligent Substation Automatic load shedding system proposed in this work will help mitigate this problem by eliminating human interaction with the system and ensuring fairness in load distribution.

Load-shedding is a process by which the electrical authority handles the dearth of the electrical power being consumed by the society. Shedding is done to minimize the load being consumed by the society through several substations which are connected to the main power station . When the frequency of the power generator falls down, it fails to generate the required power. As a result, the authority lacks the scheduled amount of power & this leads the authority to perform a shedding. And the main station orders the sub-stations to cut some of the feeders for a certain period of time & thus the shedding procedure continues.

1.2 Objectives

1] Presently, the consumers have an agreement with utility to avail the electricity within the limit of ontract interest. Notwithstanding, the agreement request is abused a few times by the buyers prompting stacking of dispersion transformer over its stacking limit .

2] The shopper likewise covers greater power bill for abundance unit because of duty structure. Consequently, in this time of open access, it has become fundamental for utilities to deal with their purchasers and give them power supply quality and dependability.

[3] in is the improvement of a regulator based methodology for controlling the heap shedding time span in an orderly manner with the goal that in the shedding the board cycle, manual work might be limited.

4] Scheduled load shedding is controlled by way of sharing the available electricity among all its customers. By switching off parts of the network in a planned and controlled manner, the system remains stable throughout the day, and the impact is spread over a wider base of customers.



II METHODOLOGY

Traditional method for load shedding management In the shedding process, under a main power station there are several sub-stations who perform power-cut for a certain period of time to control the shortage of electrical energy used by the people of the locality. In manual system of load shedding, workers from the electrical authority are engaged in the substations who attend the calls and directions from the main power station & as per the upper levels direction, power system of some area are manually cut down by the workers for a period of time. And after the completion of those areas shedding some other areas are cut-off. In this way the shortage of electrical energy is covered up by the electrical authority. Therefore an electrical power system consists of three principal components:

1. Power Station .
2. Transmission Lines and
3. Distribution Systems.
4. distribution system.

III. LITERATURE SURVEY

Supriya jaiswal

Demand side load management is a powerful solution to meet the rapidly increasing energy demand. It stabilizes the generation and demand by keeping the electricity usage under control. This paper presents a novel scheme to manage the load and electricity usage by integrating direct load control program with smart metering system. An alert system is designed to acknowledge the instants of increase in contract demand. Power consumers are provided with options to choose either load reduction or penalty prior to utility action. This approach leads to active participation of consumer in direct load control which was earlier a utility driven method. The global service for mobile (GSM) based short message service (SMS) system is used to notify the consumer to act according to the loading condition hence, the technique provides consumer based load scheduling for energy efficient and cost effective load management. Practical realization of the proposed scheme is accomplished using Arduino controller, relay modules, energy meter enabled with RS-485 port, MAX-485 and esp32.

Nkolika O. Nwazor

Demand side load management is a powerful solution to meet the rapidly increasing energy demand. It stabilizes



the generation and demand by keeping the electricity usage under control. This paper presents a novel scheme to manage the load and electricity usage by integrating direct load control program with smart metering system. An alert system is designed to acknowledge the instants of increase in contract demand. Power consumers are provided with options to choose either load reduction or penalty prior to utility action.

J Joys Nancy

The unbalance of load in distribution network is the most common problem that occurs in three phase networks. This unbalance of load mostly occurs during the peak time. At some point this unbalance may also cause phase failure. In order to prevent the phase failure and to protect the load connected to the phase, the load connected across the three phases will be shared equally. This is possible with the help of three phase load balancing technique. Three phase load balancing can be achieved with the help of our proposed method. In this method the power along each phase will be detected with the help of current transformer and the load value which is connected across each phase will be found by calculating the power consumption across each load and it will lead to switching of loads to the least loaded phase.

Lianqing Zheng; Shihua Zhao; Lixin He

This paper first introduced the reasons of traditional paralleled converter cells not being current-sharing. The fuzzy logical control is applied to parallel converter cells current-sharing control technology by making an in-depth research and design on current-sharing loop cells fuzzy logical controller. In order to reduce adjustable-range of current and make each module cells current balance quickly, a middle current-programming automatic current-sharing technique is presented. Simulation results show that the proposed current-sharing control method can achieve better dynamic current-sharing and load-sharing characters, and can operate well within the large adjustable-load range.

IV. SYSTEM DESIGN

4.1 Block diagram

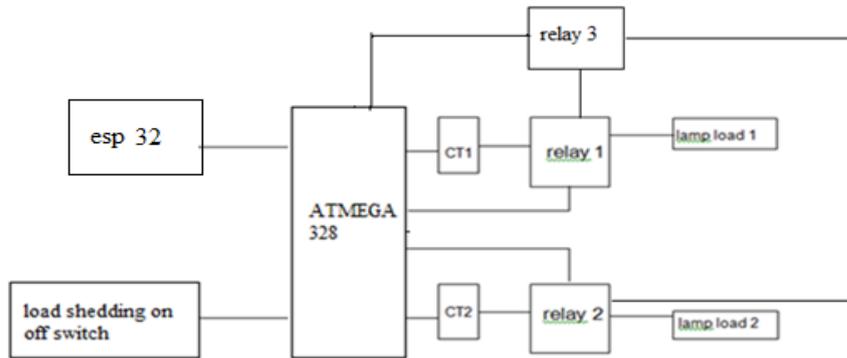


Fig. 4.1:feeder load sheddiing using iot

4.2 Circuit diagram

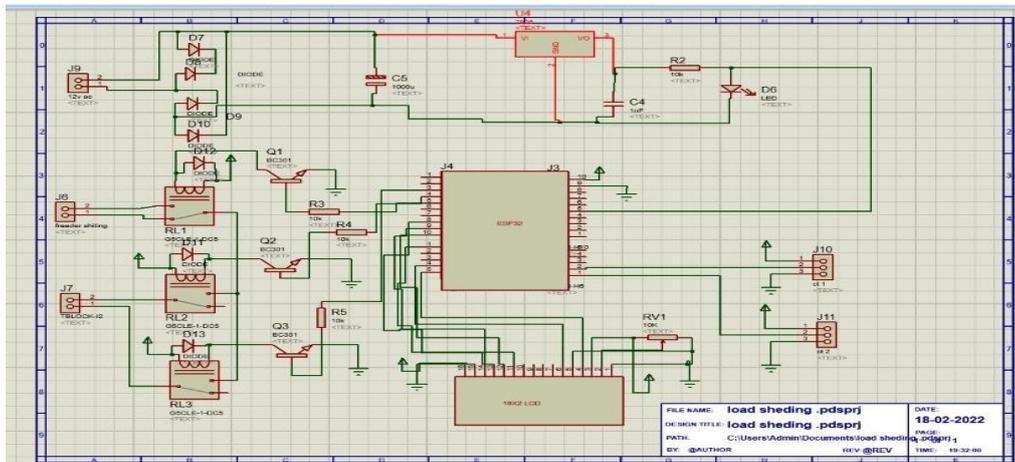


Fig. 4.2 Circuit diagram

4.2.1 Working

Initially the power along each phase will be detected with the help of current transformer and the load value which is connected across each phase will be founded by calculating the power consumption across each load. With the help of load value in each phases load balancing will be done by using certain method. Difference of Load values across each phase will be founded and those values will be compared to a



threshold value which will be a predetermined one. The value which is greater than the threshold value will be founded, and the load values will be compared and the larger one will be the largest load and the smaller one will be least load. Between these two phases the load will be switched with the help of relays. Switching on and off of the relays will be controlled by the Arduino, and this will be a continuous process. Once the difference value reduces below the threshold value the load shifting process will be stopped and the load value will be.

4.2.2. Algorithm

Step 1: Starting.

Step 2: Given sanctioned limit 800w 1st and 2nd consumer.

Step 3: Check energy consumed by consumer 1 and 2.

Step 4: Checking load used on power system.

Step 5: If transformer loaded then check consumer energy crossed the access limit then send SMS to consumer and cut off the light (only extra energy consumed consumer).

Step 6: If transformer is not overloaded but wattage sanction is crossed by any customer send SMS to consumer” limit exceeded “.

VI. CONCLUSION

According to our observations real time clocks (RTC) work more accurate than other time-keeping choices, it permits the fundamental framework to perform significant assignments, and they don't consume a lot of force. Usefulness of Electronic gadgets could in fact increment by utilizing constant clocks (RTC). Certain electronic gadgets can depend on constant tickers while looking at the hours of past capacities. In the event that the capacities have occurred inside a chose period of time, device functions can be reduced drastically. Hence real time clocks interfaced with 328p microcontrollers could be used extensively in load shedding time management system by utility departments.

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