

GSM Based Wireless Load-Shedding Management System for Non Emergency Condition

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Abstract—In that papers, most of us current a new cost-effective wireless allocated fill shedding technique for non-emergency scenarios. Throughout electric power transformer destinations wherever SCADA technique can't be utilized, your suggested remedy offers a realistic choice that will includes the usage of microcontrollers as well as recent GSM commercial infrastructure in order to deliver first alert SMS communications in order to customers counseling them to proactively lessen their particular electric power usage prior to technique capacity can be attained as well as step-by-step electric power shutdown takes place. Some sort of story verbal exchanges process as well as message arranged are invented to deal with your messaging between the transformer web sites, the spot that the microcontrollers are situated as well as the spot that the sizes occur, as well as the key control web page the spot that the repository server can be organized. Furthermore, the machine posts alert communications towards the end-users mobile products which have been utilized since verbal exchanges terminals. The system has become put in place as well as tried by using distinct experimental effects.

Keywords-Smart Grid, Load shedding, Demand Side Management, GSM Wireless Networks, SCADA systems.

I. INTRODUCTION

India is experiencing an unprecedented increase in electricity consumption. A direct consequence of these increase demand is the enormous load burden that has been imposed on the national electricity grid, especially during peak demand periods. One solution to this problem would be lode shedding is a process in which electric power is cutoff on certain lines of power transformers when the demand approaches the system capacity. Load shedding is particularly important in isolated systems (islands of service) since there is no interconnected supply of power if the demand exceeds the power rating of the transformers. Typically load shedding is done by supervisory and monitoring systems such as supervisory control and data acquisition systems known as SCADA systems which continuously monitor vital parameters of the power system and decide when and how much load to shed. SCADA systems usually shed the appropriate power load keeping a well-balanced system and at the same time maintaining reasonable customer satisfaction. In a typical load-shedding scheme a list of loads is used during the shedding process depending on a priority level attributed to the various customer loads. When there is an excessive load on the transformers, the SCADA system starts shedding the lowest priority load.[7] This method of shedding is acceptable as long as the transformers are monitored by the central SCADA system. Remotely-located transformers, lacking SCADA connection cannot benefit from this scheme. Such transformers should have their own protection mechanisms for handling emergencies [1-3]. Load shedding in general has been studied extensively in the literature and adaptive strategies for Emergency Load-Shedding (ELS) circumstances in isolated systems, in particular, are studied in detail in [4-6]. In this paper we present a novel wireless-distributed load shedding management system which is designed to handle remotely distributed transformers that are not connected to a SCADA system. The proposed system is designed for nonemergency cases and proactively involves users in the shedding process. Systems

located in a hot climate zone, such as the emirates of Sharjah and Dubai of the United Arab Emirates, have many remotely-distributed transformers throughout the coverage area. During hot days, the peak power consumption is significantly higher than normal loads. Even though the power grid is designed to handle such peak loads, it is possible that spurious excessive demand may cause power shutdown.

II .LITERATURE SURVEY

Power need within Maharashtra have been rising at a very high price within the last 24 months. With 2004-05, the high need went up by 11357 MW to 12749 MW around 2003-04 which is a leap associated with 12.26% when compared with before regular increase associated with 2.74%. As the need have been increasing, the age group potential has always been stable together with maximum option of 9300 MW. This particular experienced ended in some sort of high hole associated with 3449 MW within 2004-05. With 2005-06, the high need recorded within May well 05 was 12987 MW and that is once more some sort of leap associated with 238 MW in the earlier yr. This particular experienced ended in some sort of shortage (load shedding) of 3687 MW within May well 05. Inside the thirty day period associated with Oct 05, the high evening need that experienced decrease to 10,000 MW within September has within the last twenty times risen to 12,200 MW. This is a leap associated with 2,250 MW inside a amount of 7 to 8 times. Past this can be a feature Mumbai during which Tata Electrical power had been attracting MSEDCL's strength within high time increasing weight losing within MSEDCL's areas. Thinking about the increase sought after, the existing debt associated with 3500 -- four thousand MW could possibly rise to 10,000 MW by means of 2012-13 in the event endeavors' are not built to increase availability. Electrical power is definitely a vital part inside the fiscal increase of your Express. As per the Economists, the investment associated with Rs. 1 Cr. inside the strength sector ends up with some sort of Rs. 20 Cr. Progress throughout the market. MSEDCL is additionally trying to take care of the need via Desire Aspect Supervision Procedures.

III. SYSTEM ARCHITECTURE

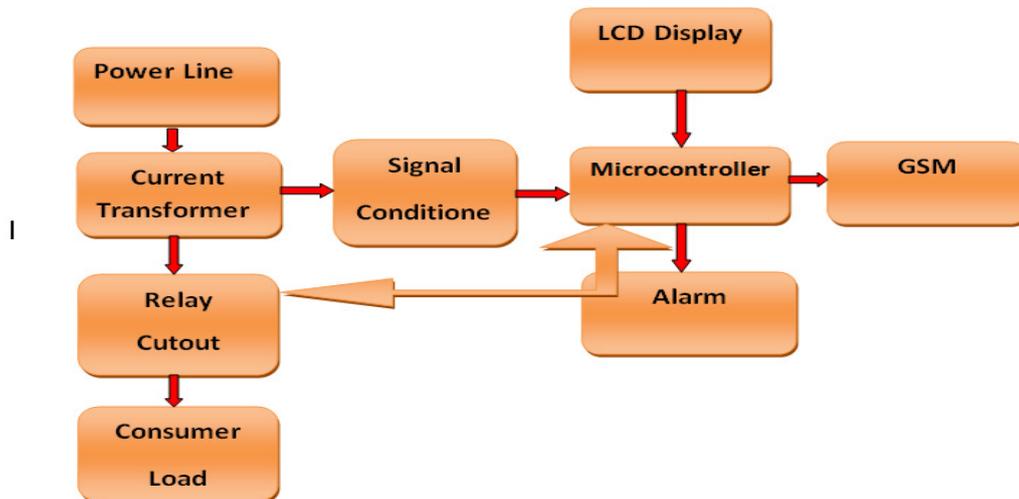


Fig3.1 Block diagram of system

In above system, consumer energy consumption is continuously monitored by current transformer. This output from CT is given to signal conditioner, so that it can be made compatible with microcontroller input. This input is compared with max. Limit allocated to the customer.

This comparison is done only at pick time of energy consumption like 6 P.M to 10 P.M. If consumer uses more energy then set limit, then initially he gets warning messages to user still if he didn't reduce power consumption then energy supply is cutout by means of relay.

IV. FLOW CHART

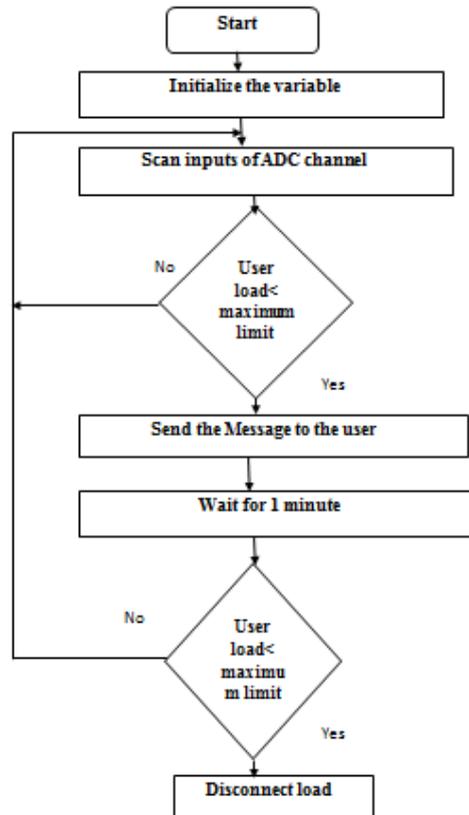


Fig3.2 System flow architecture

V. HARDWARE DESCRIPTION

Current Transformer, Rectifier Filter and Circuit:

Here current transformer is used to step down the load current. This current is actually and then transferred over the full rectifier circuit filtering. Circuit to get the voltage in terms of load current. Then it is given to the scaling amplifier, buffer and unity gain amplifier.

Scaling Amplifier, Buffer and Unity Gain Amplifier:

The scaling amplifier is used to provide the necessary scaling gain for the rectified signal. The unity gain amp is used in order to isolate and reduce the burden (loading effect) to the previous stage. Then the output is given to the serial ADC.

Analog to Digital Converter:

ADC used here is serial ADC. It converts the analog information to digital data. This digital data is given to the micro-controller.

Microcontroller:

Here, micro-controller will take the data from serial ADC and it will transmit to the PC. Then micro-controller will wait to receive data from PC. If the received data will be compared with stored per-

defined value result is send back to the micro-controller. Then System Development micro-controller gives signal to the relay.

Relay Driver Circuit:

It is used to drive the relays. Micro-controller gives the signal to the relay driver circuit to drive the relay so the heavy load equipment's will be turned on or off.

Buzzer:

Whenever overload condition occurs the buzzer will start.

VI. SOFTWARE DESCRIPTION

The software was designed in Assembly Language. The microcontroller is a programmable chip, which needs to be programmed to perform the desired functions (Yelaran and Emery, 2010). The source code was first compiled on the notepad. Proper attention was paid to the code during compilation so as to avoid any form of logical and syntax error. The generated hex file after compilation was then transferring to the microcontroller chip with the aid of an EDSIM programmer.

VII. GSM MODEM INTERFACE UNIT

The GSM modem (Samsung G5282) was used to perform communication between the user and microcontroller. This is responsible to do the bidirectional operation of sending an alert sms to user mobile about the current status of the load and sent command to microcontroller from user. These alerts sms sent to the user mobile that are already stored in the draft of the phone modem. Whenever the microcontroller triggers the transistor connecting to the GSM modem, it will either request for the SMS in the draft to be sent to the user or to put ON the GSM phone.

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