

Review Paper on

Self-Acting Programmable Load Shedding System

Prof. Aishwarya Sankpal¹, Divya Patil², Bhavna Gaikwad³, Akanksha Jadhav⁴ Prof. Aishwarya Sankpal, E&TC

Department, GSMCOE

Divya Patil, E&TC Department, GSMCOE Bhavna Gaikwad, E&TC Department, GSMCOE Akanksha Jadhav, E&TC

Department, GSMCOE

Abstract –

Electricity is one of the most important needs of today's civilization. Without this, many unnecessary applications will grind to a halt. As we all know, the demand for electricity is increasing. For this reason, energy companies tend to load when demand exceeds supply. Therefore, there is a need for precise measurement of specific time in distribution. Self-Acting programmable load shedding system is a reliable and effective load shedding technology that takes over the manual work of turning power on/off according to time. Distribution substations can be monitored open and closed in certain locations.

Keywords: load shedding, real time clock (RTC)

1. Introduction:

The project is an automatic load operation system that controls load operation, multiple numbers of times according to programmed instruction. Removes the manual on/off switch from the load. Real time clock (RTC) is used to keep track of time and can be turned on and off. The idea here is to manage the power obtained from the grid in a balanced way, without producing all of the electricity. Replace electrical equipment. Therefore, the system eliminates manual work by switching loads on and off. When this input equals real time, the microcontroller activates a special relay according to the command to turn the load on and off. The microcontroller's output helps power the feeder, and the display helps the operator see what's happening in the system. The local number is displayed on the LCD screen.

A. Scope:

Global competition, limited resources and environmental protection will be decisive in the development of automation technology. Climate change concept: new requirements for machines and plants. The model enables a new sensor solution. In the future, technology demand in the Far East, especially China, must increase. There is a growth

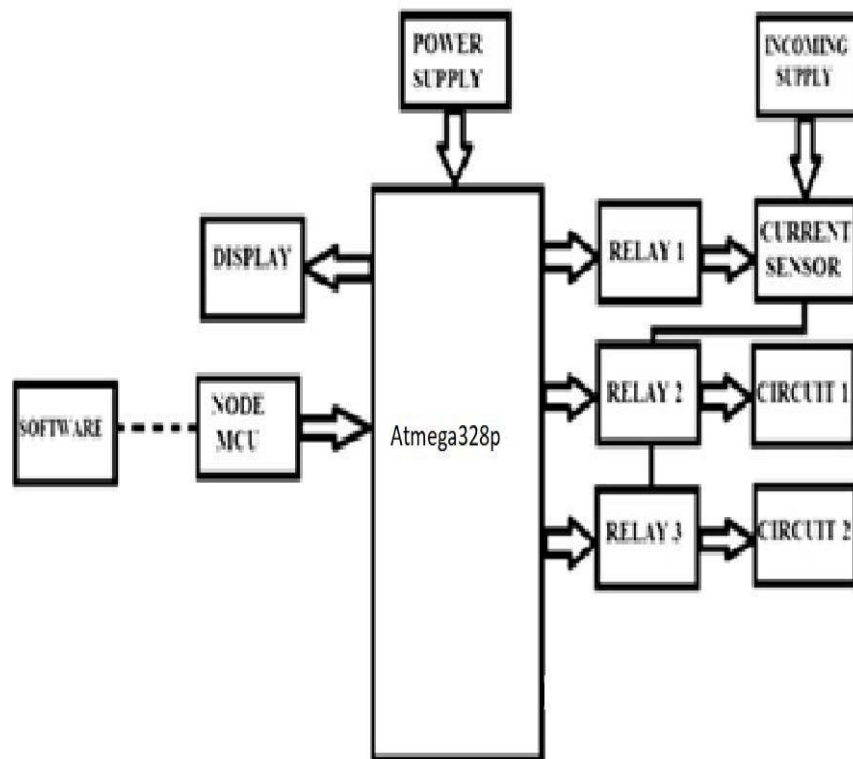
towards greater automation and continuous operations such as automatic power management. Besides traditional devices, vision systems and image sensors will also become popular. In this project people can manage load shedding. This design could have been better. Modern sensors will play an important role in reliability and investment protection. The project may become more based on application and use of advanced technology every negativity will not be approved.

2. Methodology:

controller and the relay, which will provide sufficient voltage for relay operation.

A. Block Diagram:

In the RTC-based load shedding system, we can control the single-phase and three-phase output load with the help of Atmega328p microcontroller. The main component of this system is the Atmega328p microcontroller. In addition to the microcontroller, there are also some peripherals connected to the



B. Components:-**i) Voltage Regulator:**

- 1) LCD (Liquid Crystal Display)
- 2) RTC (Real Time Clock)
- 3) Relay

Now how the interface device works with the controller is listed below. We need to use the program to set the operating time when the system is first turned on. After setting the working time, RTC will measure the time and when the time is up, RTC will send signal to the controller. Depending on the RTC signal the microcontroller will turn the relay on or off so that the relay can be turned on or off. The microcontroller operates the relay with the help of the relay driver circuit. This circuit is needed because the voltage required to operate the relay is not sufficient, so the relay driver circuit is connected between the Voltage regulator is a system used to maintain a constant voltage. The resistance of the voltage regulator changes depending on the load, providing a constant output voltage. The controller works like a variable resistor, continuously controlling the voltage distribution to maintain a constant output voltage and continuously dissipating the variable electrical input and controlled electricity in the form of electrical waste. In contrast, a switching regulator uses active components to interpolate the output on and off. Efficiency is limited because the control voltage of the circuit must always be lower than the input voltage, and the output voltage must be high enough to allow the electronic components to always lose some voltage.

ii) RTC:

Based on the DS1307 module, the DS1307 serial real-time clock (RTC) is a low-power, fully binary coded decimal (BCD) clock/calendar plus 56 bytes of RAM. Addresses and data are transferred via a bidirectional I²C bus. The clock/calendar provides seconds, minutes, hours, days, months and years. For months with fewer than 31 days, the last day of the month is adjusted to include the leap year correction. The watch operates in 24-hour or 12-hour mode and has an AM/PM indicator. DS1307 has built-in power sensing circuitry that detects a power outage and automatically switches to backup power. Working time will continue when used by backup power.

iii) LCD:

LCD (liquid crystal display) screen is an electronic device with many uses. 16x2 LCD screen is a very simple model that is frequently used in many devices and circuits. These modules are suitable for seven-segment LEDs and other multi-segment LEDs. The reasons for this are: LCDs are easy to program; Special presentations and even special characters (as opposed to seven episodes), performances, etc. There is no restriction on. 16x2 LCD means each line can display 16 characters and there are 2 lines like this. On this LCD each character is displayed in a 5x7 pixel matrix. The LCD has two temporary lists, Command and Data. The Register instruction stores instructions for the LCD. Commands include starting, clearing the screen, adjusting the cursor position, controlling the screen, etc. These are instructions for basic operations on the LCD. Data is the ASCII value of the character to be displayed on the LCD.

iv) Relay:

Relay is used to get output. Control from the output of the relay to the mains supply. The whole body works like an automatic switch. Atmega328P:

ATMEGA328P-PN is a high-performance microcontroller unit (MCU) powered by 8-bit AVR RISC architecture. It has 32KB Flash memory which provides enough space to store processes and files. This versatile microcontroller can operate at three different voltages, including 2.5V, 3.3V and 5V, making it suitable for many applications. The 28-pin PDIP package in a W-tube package allows easy integration into a variety of electronic designs. Whether you're building a hobbyist project or a professional application, ATMEGA328P-PN delivers performance and reliability.

v) Resistor:

The resistor is a passive electrical component that creates resistance in the flow of electric current.

vi) LED:

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. This effect is called electroluminescence.

vii) I2C LCD module:

I2C LCD module is used in applications that require visual or text reading, this device is also used in cases where tab indicator is required but 7 consecutive GPIOs cannot be added to each other. GPIO port AC power supplies provide power to devices that do not have internal devices to draw electricity and power from the mains.

viii) Adapter:

It is a type of external power supply, often enclosed in a case similar to an AC plug. AC adapters deliver electric power to devices that lack internal components to draw voltage and power from mains power themselves.

ix) Transistor:

It is used for amplifying electric current in circuit and to avoid reverse flow of current.

C. ADVANTAGES:**E. APPLICATION:**

- i. Power distribution companies to shade load automatically, reduce down time for critical load, reduce spinning reserve requirement etc.
- ii. Implemented in factories to manage the on off time of different generator sets.

- iii. Owner homes to switch on and off different generator set.

F. Hardware:

- i. Differs from current system we can program the Load shedding process.
- ii. RTC provides the real time.
- iii. LCD provides the real time and Load shedding timings.
- iv. Easy to set up, low cost, Easy to use.
- v. Economical and reliable & Manpower dependency is less.
- vi. Power can be saved.
- vii. Accuracy in time
- viii. Effective distribution of power.
- ix. We can set the time in advance

3. CONCLUSION

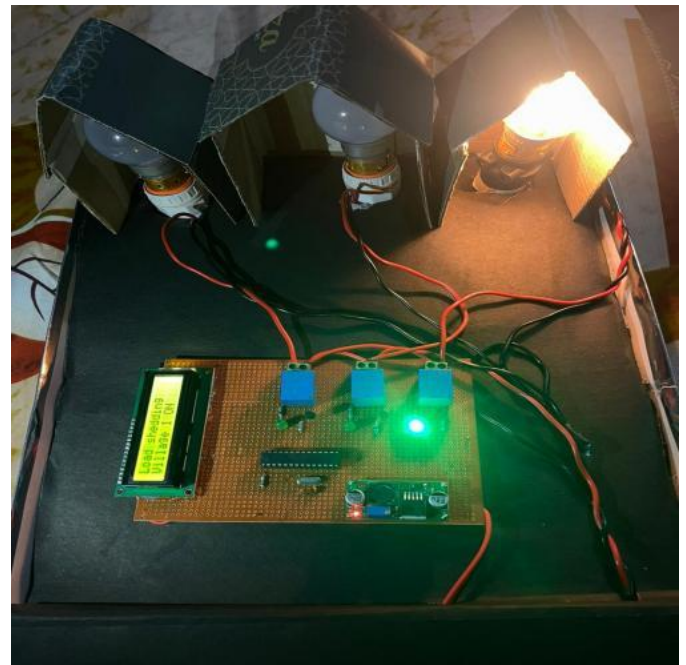


Figure 2

- i. Creates unsatisfied utility customers.
- ii. Cuts revenue for the energy supplier.
- iii. Surges can occur when restoring power afterward, damaging appliances and equipment.

A successful experiment was carried out to design and implement a prototype of an automatic programmable load reduction system for electric power. The system can change the distribution of different areas and is provided by the donor in a timely manner. The system distributes electricity from one place to different areas in a short time for each area pre-determined by the operator.

Additionally, when the load in a particular area exceeds the rating of the power supply, the system can shut down and move on to the next area. Successful projects have been tested and the results are satisfactory. Studies have been carried out to implement this system and an action cycle has been developed accordingly. The design is made using embedded system technology. The purpose of this is to reduce the number of elements and make the system simple and efficient.

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