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# Auto Power Supply Control from 4 Different Sources

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**ABSTRACT:** The main objective of this project is to provide uninterrupted power supply to a load, by selecting the supply source automatically from any available one out of 4 such as: mains, generator, inverter /and solar in the absence of power supply. The demand for electricity is increasing every day and frequent power cut is causing many problems in various areas like industries, hospitals and houses. An alternative arrangement for power source is thus desirable. This project employs four switches to demonstrate / activate respective failure of the source of power supply. When any of the switches is pressed, it shows the absence of that particular source. Switches are connected to the microcontroller as input signals. A microcontroller of the 8051 family is used. The output of the microcontroller is given to the relay driver IC, which switches appropriate relay to maintain uninterrupted supply to the load. Output is observed using a lamp drawing power from the mains initially. On the failure of the mains supply (which is actuated by pressing appropriate switch) the load gets supply from the next available source i.e. an inverter. If the inverter also fails, it switches over to the next available source, and so on. The current status, like which source is supplying power to the load is also displayed on an LCD. As it is not feasible to provide all 4 different sources of supply, one source with an alternate parallel arrangement is provided to get the same function for demo purposes. However, 4 different sources if available they can be used. The project can be further enhanced by using other sources like wind power also, and then can take into consideration the best possible power source – the one whose tariff remains lowest at a given moment.

**KEYWORDS:** Power Source, Electricity, Microcontroller

## I. INTRODUCTION

An important requirement of electric power distribution systems is the need for automatic operation. In particular, the rapid and reliable transfer of the system from one power source to another during certain system events is important to achieving the reliability goals for such systems and the facility serves. In the existing system, they made four switches to demonstrate the corresponding failure of that power supply. By pressing any one of the switches, absence of that particular source can be found out. The switches are connected as input signals to microcontroller. In this system 8051 microcontroller is used. The relay driver IC collects output of microcontroller, which adjusts relay to maintain continuous supply to the load. In this proposed system, we made use of GSM technology, which helps in operating the system from the different places. This GSM technology is a latest technology, which is use to collect the information about the different sources either the switch is ON or OFF. In this system, we made use of ARM7 Microcontroller which has many advance features than 8051 microcontrollers. Auto Power Supply Control System from 4 Different Sources Using PIC Microcontroller: The auto power supply control system is very convenient system for that consumers who want to attains uninterruptible power supply from different sources such as solar, main, generator and inverter. If we see it at commercial level, then we can estimate that there are so many consumers or customers which have the equipment or machines whose requirements is only uninterruptible power supply. Such as the data base companies whose all work is done on computer then it is required an uninterruptible power supply all the time, otherwise their computer could be off during the time when the load is shifted on another source, similarly the companies which have the data base production machines then it also could be also off during the load shifted then their production can be stop or damage. This auto power supply control system works on the principle of auto function for switch over the load to other available source without wasting any time or switch off the load. Here for the demonstration purposes, we have used the selection keys for switchoff any source of supply. In this system, the microcontroller which is very essential component of this system always, keep sensing the whole available sources. When any source is switched off through the selection keys then the microcontrollershifted the load to the other supply source by giving the signal to the relay driver IC then the relay driver IC switched on the appropriate load relay. The whole function is done by the microcontroller in micro seconds and this shifted time can be changed during the programming of microcontroller. Here 4 load relays are used which are connected in parallel with load and 4 sources of supplies are also connected in parallel with these load relays. These load relays consist of normally open and close

contacts and are operated through the relay driver IC. We have checked this system by connecting the lamp at output side as a load when any interruption is taking place during the shifted time then the lamp is blinking but here there is no any blinking take place during the shifted time means there is no any interruption in supplying the power at output side. The project can be further enhanced by using other sources like wind power also and then taking into consideration for using the possible whose tariff remains lowest. Therefore, this project provides an effective solution to provide an alternative power supply during frequent power cuts.

## II. METHODOLOGY

This project uses an arrangement where four different sources of supply are channelized to a load to have an uninterrupted operation of the load. As it is not practicable to get four sources of supply such as mains supply, wind supply, thermal supply and solar supply, we use relays only. The project has taken one source of 230v mains supply and assumed as if being fed from 4 different sources by connecting all the four incoming sources in parallel as seen in the schematic circuit diagram. The ac source to the lamp is connected to relay 1 to relay 2 to relay 3 and relay four by making the entire 'NO' (normally open) contacts parallel and all the typical contacts in parallel. Four push button switches representing a failure of corresponding supply such as mains, wind, thermal, solar are respectively connected to port 3. This project uses an arrangement of 4 different sources of supply which are channelized to a load so as to have uninterrupted operation of the load. As it is not practicable to get 4 sources of supply such as mains supply, generator supply, inverter supply and solar supply we used one source and set of relays. We have taken first source with mains supply and assumed as if being fed from 4 different source by connecting all the 4 incoming source in parallel. The ac source to the lamp is connected to four relays by making the entire normal open contacts parallel and all the common contacts in parallel. 4 push button switches are used which represent failure of corresponding supply respectively and are interfaced to the controller. Initially we have given high input singles to the microcontroller, so as result the controller generates a low output to active the first relay driver. This will result in the relay being energized and the lamp glows.

While the push button for mains is pressed that represent failure of mains supply as a result the supply is provide from the next source. And the microcontroller receives high input and generates low output to active the second relay driver. This will result in the second relay being energized and the lamp glows. When we press the generator button, it indicates the generator fails to operate and the supply comes from the next source. The next source will supply high input to the controller and which will provide low signal to the third relay and the lamp switches on. When we press the third push button the supply will choose next source now the fourth source will provide input to the microcontroller. Controller activates the fourth relay and the load will get the supply and the lamp continues to glow. When all the relay are off leaving no supply to the lamp, the lamp is switched off. We have checked this system by connecting the lamp at output side as a load when any interruption is taking place during the shifted time then the lamp is blinking but here there is no any blinking take place during the shifted time means there is no any interruption in supplying the power at output side.

The switches are connected as input signals to microcontroller. In this system 8051 microcontroller is used. The relay driver IC collects output of microcontroller, which adjusts relay to maintain continuous supply to the load. In this proposed system, we made use of GSM technology, which helps in operating the system from the different places. This GSM technology is a latest technology, which is use to collect the information about the different sources either the switch is ON or OFF. In this system, we made use of ARM7 Microcontroller which has many advance features than 8051 microcontrollers. Auto Power Supply Control System from 4 Different Sources Using PIC Microcontroller.

• BLOCK DIAGRAM:

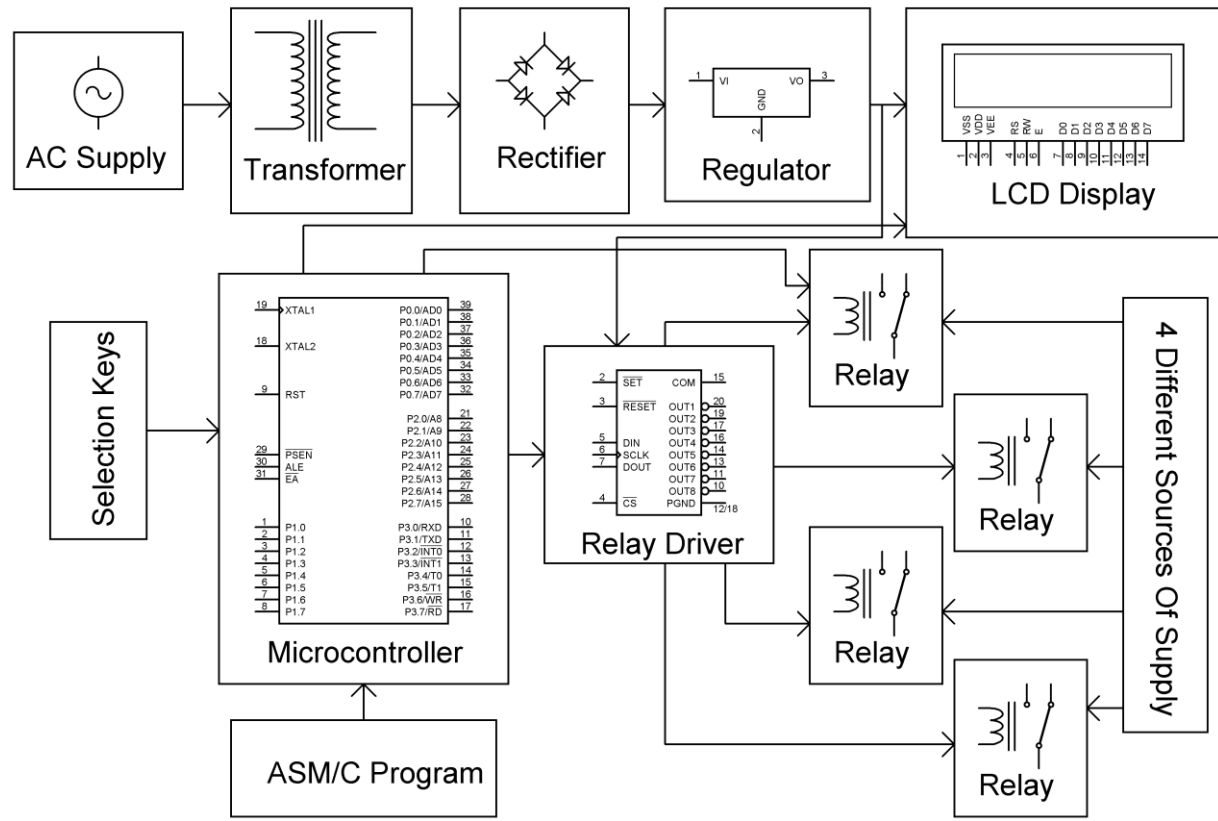


Fig 1: Block diagram

III. CONCLUSION

This project of automatic power supply from four different sources: Solar, Inverter, Main and Generator “using a microcontroller is used to handle power supply from Solar, Inverter, Main and Generator” automatically using microcontroller concept. The significance of this project lies in its various advantages and wide places of applications such as Industries, Hospitals, Banks; it has been developed by integrating Colleges/Schools, etc. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. This project provides 75KW stand-alone solar power system which is a practical solution to provide an alternative power supply or uninterrupted power supply in automated mode to the load during frequent power cuts or in cases where power cuts or power outages cannot be avoided. Now the hospital uses electricity from the Grid and diesel generator to generate electricity needed in special cases and as commonly known fossil fuels are the most expensive sources to generate electricity, costs more money and pollutes the environment, so in order to overcome these problems this project proposes stand-alone solar system with generator backup to be installed for the hospital, apart from their high initial investments, solar systems require less operation and maintenance costs, the system will last long and save money.

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