National conference on Engineering Innovations and Solutions (NCEIS – 2018)
International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2018 IJSRCSEIT | Volume 4 | Issue 6 | ISSN : 2456-3307

# Auto Power Supply Control System from Four Different Sources

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## ABSTRACT

The main objective of this paper is to provide uninterrupted power supply to a load, by selecting the supply from any source out of four such as mains, inverter, solar and generator automatically in the absence of any of the source. The demand for electricity is increasing every day and frequent power cuts is causing many problems in various areas like industries, hospitals. An alternative arrangement for power source is a must. As it is not feasible to provide all four different sources of supply, one source with alternate switches are provided to get the same function. Thus there is requirement for an alternate arrangement of power supply. This arrangement can be designed by using microcontroller and relays. When a source, say mains fails the supply shifts to next priority source generator and so on. LEDs (Light emitting diodes) can be used to show that which source is used to provide the supply.

**Keywords.** Generator, Inverter, Mains, Relay, Solar, Switches.

## 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. However, the design of such an automatic transfer system is all–too-often considered "less important" than many other aspects of the overall power system design. Nowadays, electrical power supply is one of the important elements in human being needs. The most of the human activities is dependent on electrical power supply. In other words, without electrical power supply, almost the whole of activities is become postponed or worse cancelled. For usage of daily routine, voltage supplied is within 240V ac. The need for power supply is paramount for the growth of a country, access to electricity as the basic form of energy supply to the masses is vital for the development of a nation's economy. The power sector provides a platform for economic development; electricity has brought about development in all area of productions and services. Electricity has become indispensable to socio-economic and industrial development of any nation. Using uninterrupted power supply in an automated mode, we always have a substitute arrangement as backup to take place of main power supply in case of power-cut in an emergency case, where the power cut cannot be avoided.

## II. METHODS AND MATERIAL

When the supply from all the sources (Mains, Solar, Inverter and generator) are ready, first "Normally open" switch is pressed then the mains get failed and the supply automatically shifts to inverter. To proceed further, second normally open switch is

pressed then the inverter get failed and supply is provided from solar and so on. Priority is assigned to each power source in the order of Mains, Inverter, Solar and Generator. In case the mains power fails, the supply should automatically shift to Inverter but if Inverter also fails at the moment then the supply will automatically shift to next priority source. Figure below explains the working and construction of the Auto power supply from four different sources. As shown in the diagram the four sources are Mains, Inverter, solar and Generator, four "Normally open" switches are used to show the failure of each supply, four relays are used to provide protection at each respective output. This output can be used to drive any load such as a lamp or motor. LEDs are used to display the source of supply. Other case is when the power switches from one source to another source, say Inverter fails and supply shifts to solar, if the mains come back then the supply will automatically reach back to mains power instead of switching to solar. At the output of microcontroller, each output port is connected to positive dc voltage. Relays are used in contact with the output port to provide switching at the output.

## III. BLOCK DIAGRAM

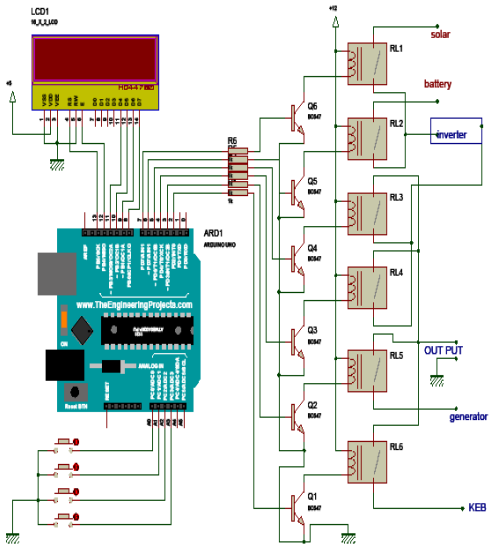
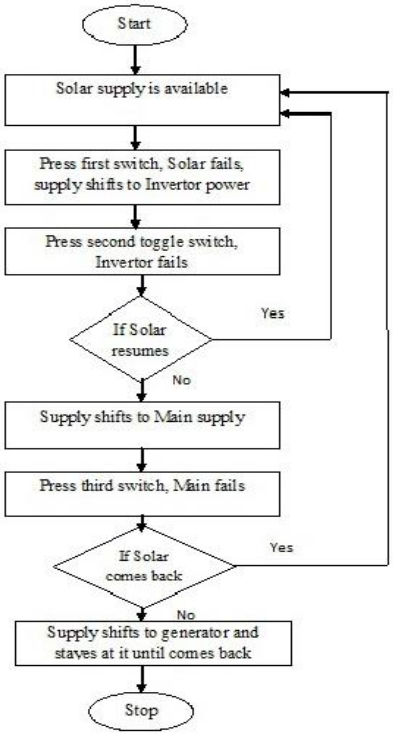



**Figure 1**. Auto Power Supply Control from Four Different Sources.

This project uses an arrangement of four different sources of supply which are channelized to a load so as to have an uninterrupted operation of the load. We have taken first source with solar supply and assumed as if being fed from four different sources by connecting all the four incoming sources in parallel. The ac source to the lamp is connected to four relays by making the entire normally open contacts parallel and all the common contacts in parallel. Four push button switches are used which represent failure of corresponding supply respectively and are interfaced to the controller. Initially we have given high input signal to the microcontroller, so as a result the controller generates a low output to activate the first relay driver which will result in the relay being energized and the lamp glows. While the push button for solar is pressed that represents failure of solar supply as a result the supply is provided from the next source and the microcontroller receive high input and generates low output to activate the second relay driver which will result in the second relay being energized and the lamp glows . When we press the inverter button, it indicates the inverter or fails to operate and the supply comes from the next source and 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 and when we press the third push button the supply will chose next source now the fourth source will provide input to the microcontroller and controller activates the fourth relay and the load will get the supply and the lamp continues to glow. When all the relays are off leaving no supply to the lamp, the lamp is switched off. One 16 x 2 lines LCD is used to display the condition of the supply sources and the load on real time basis.

## IV. FLOW CHART




## V. RESULT

It provides a continuous power supply to the output load through any of the sources from which we are operating the device, i.e., inverter, solar and generator automatically in the absence of any of the source.

## VI. CONCLUSION

The main scope of this paper is to provide a continuous power supply to the output load through any of the source in the absence of any of the source. The paper can be further enhanced by using GSM, other sources like wind power and also then taking into consideration for using the best possible power whose cost remains lowest at that moment. The significance of this paper lies in its various advantages and wide places of applications where this project can be used efficiently.

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