Auto Power Supply Using Different Sources

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***ABSTRACT*—The main purpose of this project is to provide continuous power supply to a load, by selecting the power supply from any of the four sources namely mains, inverter, solar, generator automatically in case if one of the source is absent. the need of electricity is increasing in todays life and the frequent power cuts of electricity are causing problem in many different areas like colleges, schools, banks, industries. thus there is requirement for an alternate(others) arrangement of supply. This arrangement can be designed by using arduino uno(micro controller) and relays. when a source, say mains fails the supply automatically shifts to next priority source inverter) and so on. LEDs (light emitting diodes) can be used to show that which sources is used to provide the supply**

Index Terms—Arduino Uno, Relays , LCD

1 INTRODUCTION

Important requirement of electric power distribution system is the need for automatic operation. In particular the transfer of one 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 had made different switches to demonstrate the failure of that power supply. By pressing any of the switch, absence of that particular source can be found out. The switches are connected to micro controller as input supply. In this system micro controller is used. The relay driver collects output and send it to microcontroller, which adjusts relay to maintain continuous supply to the load in the project. In this proposed system, we made use of arduino uno, which helps in operating the system from the different points. This technology is made by us, which is used to collect the information about the different sources either the switch is ON or OFF. In this system, we made use of Arduino uno so that all the system work properly

2. REVIEW OF SYSTEM COMPONENTS

This section discuss the basic theory of components which used in the circuit. Though, we will be more focused on the heart of the system (arduino uno) and other component. while we leave other basic electronic components. But interested readers can see below for theory of other components used.

2.1 Relay:

A **relay** is an electrically operated device. Many relays use an electromagnet to operate a switch, but other operating principles are also used, such as solid-state relays and so on. Electromagnetic relays operate due to magnetic fields. They are composed basically of two parts: (1) The magnetic switch and (2) The operating coil. When an input pulse is introduced to the coil, a magnetic field is produced in the core of the coil. relays are either normally open/ normally close. relays are available for DC or AC excitation and coil voltages range from 5V to 230V.

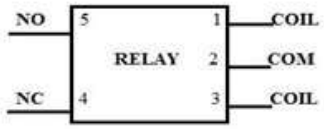


Figure 1: Pin Diagram

2.2 Ardinouno:

Arduino uno is a microcontroller board based on AT mega 328 P. it has 14 digital ip/op pins, 6 analog pins,a 16MHz quartz crystal,a USB connection ,a power jack, a ICSP header and are set button.

It contain everything needed to support the microcontroller ; simply connect it tothe computer with

the USB cable or power it with AC to DC adapter to get started.You can tinker with your UNO without worring too much about doing somethingdoing wrong . worst case you can replace for few bugs and start over again.

desirable for circuit designers. It possesses an internal comparator that acts like an OP-AMP comparator. It also has a clock (crystal) that runs at a frequency of 16MHz – this frequency is chosen so as to make the MCU trigger faster. The

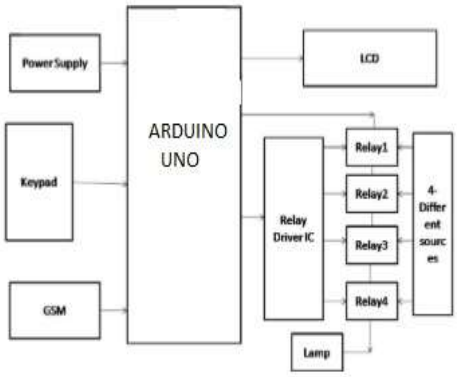
MCU takes charge of sending pulses that enable the charging circuit for the battery, the software application interface and the tracking of safe battery operational level.

2.3Voltage Regulators:

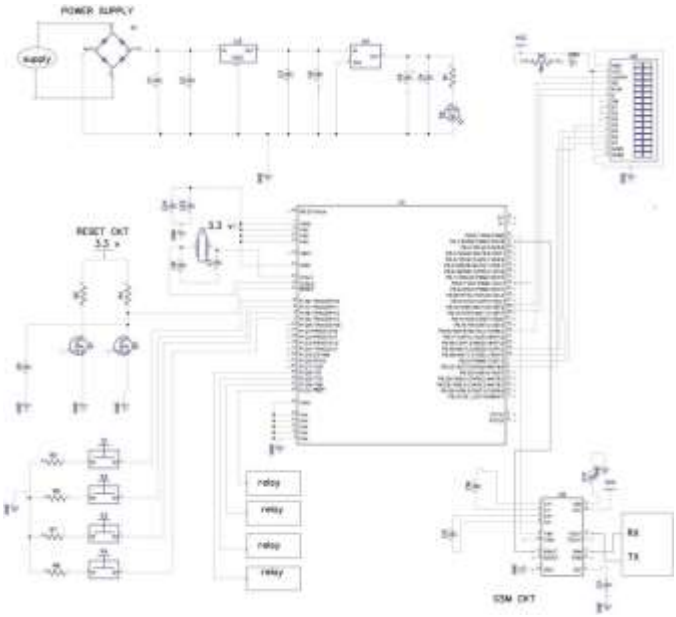
These two voltage regulators are used to give a constant DC voltage of 12V (LM7812) and 5V LM7805. They act as stabilizers due to the fact that the circuit components are to run on DC voltage that contains negligible or no pulsations at all. These regulators give an unvarying output. The LM7812 uses a heat sink due to its nature to heat up. The LM7805 however does not need a heat sink. Both the two regulators have a maximum current drawn of 1A each. The LM7812 gives an output of 12V that is fed into the comparator(LM741), though due to configurations it is not directly used as a reference voltage. The two relays RLAI and RLA2 also feed from this terminal. The LM7805 gives an output of 5Vthat is fed to the microcontroller unit. This terminal must at all
times have an output of 5V either from the rectified power or the battery terminal because the microcontroller oversees the general control of the whole circuit and always be powered.this regulator is fed by a joint from two diodes (IN4001) which prevent a flow back of current and are the alternating sources of voltage to the regulator.

3 BLOCK DIAGRAM AND CIRCUIT SCHEMATIC

3.1 BLOCK DIAGRAM



3.2 CIRCUIT SCHEMATIC



4 WORKINGPRINCIPLE

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. As it is not practicable to get four sources of supply such as solar supply, inverter supply, main supply and generator supply, we used one source and a set of relays. 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 arduino uno, 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 arduino uno 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 arduino uno 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.

5 flowchart

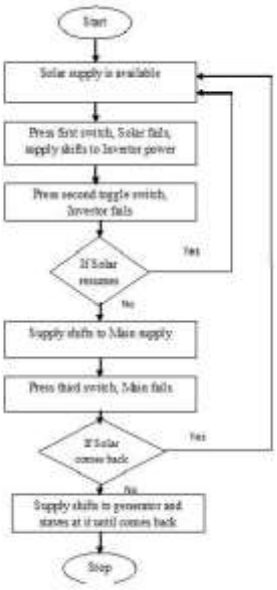


Figure5. Flowchart of Operation

6 CONCLUSION

The "auto power supply from different sources" gives continous power supply without breaking in case of power failure Automatically.

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