

AUTO POWER SUPPLY CONTROL FROM FOUR DIFFERENT SOURCES: SOLAR, MAINS, INVERTER, GENERATOR

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ABSTRACT

The main purpose of this project is offer to produce} continuous power supply to a load, by choosing the availability from any of the four sources specifically star, inverter, main and generator mechanically just in case if one the supply is absent. The need of electricity is increasing day by day and also the frequent power cuts of electricity square measure inflicting several issues in numerous areas like banks, colleges/schools, hospitals, homes and industries. Thus there's demand for AN alternate arrangement of power provide. This arrangement is often designed by exploitation ARM7 microcontroller and relays. When a supply, say mains fails the availability mechanically shifts to next priority supply generator and then on.LEDs (Light emitting diodes) can be used to show that which source is used to provide the supply.

I. INTRODUCTION

An important demand of electrical power distribution systems is that they want for automatic operation.In particular, the rapid and reliable transfer of the system from one power supply to a different throughout bound system events is vital 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 anyone of the switch, absence of that particular source can be found out.

The switches square measure 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 keep up continuous offer to the load. In this planned system, we made use of GSM technology, which helps in operating the system from the different places. This GSM technology could be a latest technology, which is use to collect the information concerning the various sources either the switch is ON or OFF.In this system, we made use of ARM7 Microcontroller which has many advance features than 8051 microcontroller.

The heart of the system styles (Microcontrollers) and its peripherals whereas we tend to leave alternative basic electronic parts. But interested readers will see [2-6] for theory of alternative parts used. Relays area unit mechanical device devices or solid state devices that operate in response to a proof which can be voltage, current, temperature etc. Electromagnetic relays operate due to magnetic fields.They are composed primarily of 2 parts: (1)The in operation coil and (2) The magnetic switch.When associate input pulse is introduced into the coil, a magnetic field is produced in the core of the electromagnet. This action causes the switch to slide. Relays are either normally open or normally close. Relays area unit accessible for DC or AC excitation and coil voltages vary from 5V to 230V.

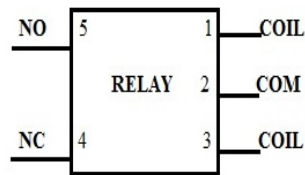


FIGURE 1: PIN DIAGRAM

II. METHODOLOGY

Initially it given high input signal to the microcontroller, so as a result the controller generates a low output to activate the first relay driver which is able to end in the relay being energized and also the lamp glows. While the electrical switch for star is ironed that represents failure of star offer as a result the provision is provided from ensuing supply and also the microcontroller receive high input and generates low output to activate the second relay driver which is able to end in the second relay being energized and also the lamp glows .When we press the electrical converter button, it indicates the electrical converter or fails to control and also the offer comes from ensuing 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 after we press the third electrical switch the provision can selected next supply currently the fourth supply can 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 deed no offer to the lamp, the lamp is changed. One 16 x 2 lines LCD is used to show the condition of the provision sources and also the load on real time basis.The Eight NPN Darlington connected transistors throughout this family of arrays square measure ideally suited to interfacing between low logic level digital equipment (such as TTL, CMOS or PMOS/NMOS)and the higher current/voltage requirements of lamps, relays, printer hammers or alternative similar hundreds for a broad vary of pc, industrial, and consumer applications.The ULN2803 is meant to be compatible with customary TTL families whereas the ULN2804 is optimized for 6 to fifteen V high level CMOS or PMOS.

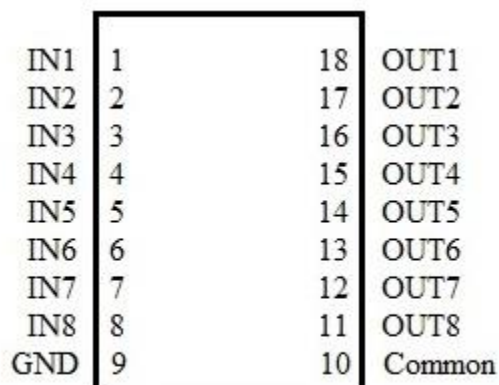


FIGURE 2: PIN DIAGRAM (ULN2803)

These 2 voltage regulators square measure wont to provides a constant DC voltage of 15V (LM7815) and 5V LM78L05.They act as stabilizers because of the very fact that the circuit elements square measure to run on DC voltage that contains negligible or no pulsations in any respect. These regulators give an unvarying output. The LM7815 uses a sink because of its nature to heat up. The LM78L05 but doesn't want a sink. Both the two regulators have a maximum current drawn of 1A each.The LM7815 provides Associate in nursing output of 15V

that's 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 LM78L05 provides Associate in nursing output of 5V that's fed to the microcontroller unit. This terminal should in Associate in Nursing respect times have an output of 5V either from the corrected power or the battery terminal as a result of the microcontroller oversees the final management of the whole circuit and must always be powered. This regulator is fed by a joint from 2 diodes (IN4001) that forestall a flow back of current and square measure the alternating sources of voltage to the regulator.

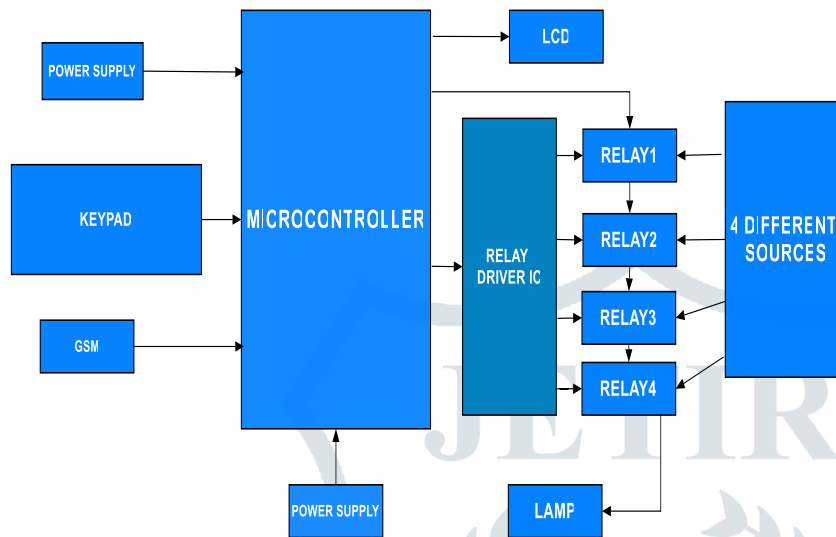


FIGURE 3: BLOCK DIAGRAM

III. RESULT AND DISCUSSION

This project uses an appointment of 4 totally different thusources of offer that are channelized to a load soon have Associate in nursing uninterrupted operation of the load. As it isn't practicable to urge four sources of offer like star offer, electrical converter offer, main offer and generator offer, we used one source and a set of relays. We have taken 1st supply with star offer and assumed as if being fed from four totally different sources by connecting all the four incoming sources in parallel. The ac source to the lamp is connected to four relays by creating the complete unremarkably open contacts parallel and every one the common contacts in parallel. Four electrical switch switches are used that represent failure of corresponding offer severally and are interfaced to the controller. Initially we've given high signal to the microcontroller, so as a result the controller generates a low output to activate the first relay driver which can end in the relay being energized and also the lamp glows. While the push button for solar is pressed that represents failure of star offer as a result the availability is provided from succeeding supply and also the microcontroller receive high input and generates low output to activate the second relay driver which can end in thesecond relay being energized and the lamp glows . When we press the electrical converter button, it indicates the electrical converter or fails to control and also the offer comes from the next source and the next source will offer high input to the controller and can|which can|which is able to} offer low signal to the third relay and also the lamp switches ON and after we press the third electrical switch the availability can selected next supply currently 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 exploit no offer to the lamp, the lamp is switched off. One 16 x 2 lines show|LCD|digital display alphanumeric display} is employed to display the condition of the availability sources and also the load on real time basis.

IV. CONCLUSION

In the “Power offer from four totally different sources: star, Inverter, Main and Generator” has been explained during this project with all its features and details. The significance of this project lies in its varied blessings and wide places of applications like Industries, Hospitals, Banks; etc. It has been developed by integrating Colleges/Schools, etc. It has been developed by desegregation options of all the hardware elements used. Presence of every module has been reasoned out and placed strictly thus conducive to the simplest operating of the unit.

V. REFERENCES

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