Microcontroller Based Automatic Load Sharing Of Transformer

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Abstract:

In this project "AUTOMATIC LOAD SHARING OF TRANSFORMERS" we are using two transformers, one is main transformer (TF1) and the next is backup transformer (TF2). Here the load is directly connected to the secondary of the main transformer as well as backup transformer; here two transformers are connected through the relay. The transfers switch senses when utility power is interrupted, and starts up the transformer TF2 which acts as a backup transformer. If the utility power remains absent, the transfer switch disconnects the load from the utility and connects it to the Transformer TF2, restoring electricity to the load. The transfer switch continues to monitor utility power, and when it is restored, switches the load from the Transformer TF2 back to the Main transformer TF1. Once the Transformer TF2 is disconnected, it goes through a cool-down routine and is automatically shut down.

Keywords: In Microcontroller Based Automatic Load Sharing Of Transformer Project Following Equipment are used

1. Current Transformer
2. Voltage Transformer
3. Microcontroller 8051
4. ADC 0804
5. Lamp
6. Control Switches
7. Relays

Introduction:

In this project the transfers switch senses when utility power is interrupted, and starts up the transformer TF2 which acts as a backup transformer. If the utility power remains absent, the transfer switch disconnects the load from the utility and connects it to the Transformer TF2, restoring electricity to the load. The transfer switch continues to monitor utility power, and when it is restored, switches the load from the Transformer TF2 back to the Main transformer TF1. Once the Transformer TF2 is disconnected, it goes through a cool-down routine and is automatically shut down

Literature Review:

In literature review we can say that in the old project they do not uses the microcontroller the man power is requird for load transfaring on transformer due to this the contineuty of supply is not maintained.

Methodology:

The present system is designed around two transformers. One transformer (TF1) is used as the main supply and the other transformer (TF2) is used in the place of the generator (for demo purpose). These two transformers are connected with the relay which is controlled by the embedded controller. The loads are connected to the main line (TF1) and as well as to the TF2.

Initially TF1 is connected to the load, the loads run with this power. Due to any reason this power is interrupted, then it is identified by the controller and it immediately switches ON to the TF2 through the relay. The controller continuously monitors the TF1 (main line).

Project Development:

1. Power Supply Section:

This section is meant for supplying Power to all the sections mentioned above. It basically consists of a Transformer to step down the 230V ac to 18V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification the obtained rippled dc is filtered using a capacitor Filter. A positive voltage regulator is used to regulate the obtained dc voltage.

2. Micro controller Section:

This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

3.Transformers:

In general, the ac line voltage present in your house wiring is not suitable for electronic circuits. Most circuits require a considerably lower voltage, while a few require higher voltages. The transformer serves to convert the ac line voltage to a voltage level more appropriate to the needs of the circuit to be powered. At the same time, the transformer provides electrical isolation between the ac line and the circuit being powered, which is an important safety consideration. However, a line transformer is generally large and heavy, and is rather expensive.

4.ADC:

Analog to digital (A/D, ADC) converters are electrical circuit devices that convert continuous signals, such as voltages or currents, from the analog domain to the digital domain where the signalsarerepresentedbynumbers.

5.Relay:

In this project Relays are used to the Trip the transformer. A relay is an electrical switch that opens and closes under control of another electrical circuit. In the original form, the switch is operated by an electromagnet to open or close one or many sets of contacts.

Observation:

In this project we observed that if load on one transformer is increases then the relay sense the change in current & microcontroller operates & second transformer comes automatically in operation to share the load.

Conclusion:

In this project that if load on one transformer is increases then the second transformer comes automatically in operation to share the load.