

Review Paper on Automatic Synchronization of Alternator

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Abstract - This paper describes the different configurations of alternators. This unit is designed for parallel connection of alternators. This part is designed to overcome the shortcomings of the traditional methods of synchronization. In this section, the voltage, frequency of the incoming alternator is compared with the reference alternator with the help of Peripheral Interface Controller (PIC). section.

Key Words: Synchronization of Alternator,

1. INTRODUCTION

Generator synchronization is the process of matching parameters such as voltage, frequency, phase angle, phase sequence, and waveform of alternator (generator) or other source with a healthy or running power system. This is done before the generator is reconnected to the power system..

Synchronization of Alternator :

Before operating an alternator or synchronous generator in parallel to share the load with other already existing alternators. The connections (in aspects of terminal voltage, frequency, phase sequence) of the newly added alternator with the busbars of other alternators in parallel operation must be checked properly, this process is called 'Synchronization of Alternators'. varying the field excitation the generated terminal voltage of the generator or alternator can be varied.

The synchronization of frequency is done by controlling the speed of the prime mover that drives the alternator.

For synchronizing the phase sequence of the alternator the following methods can be used,

By using a phase sequence indicator.

By lamps method.

By using a synchroscope.

2. AUTOMATIC SYNCHRONISATION UNIT

The auto synchronization process simplifies process authoring by eliminating the synchronization steps. When many process descriptors are created and modified, a manual synchronization step is required to update and propagate the changes. The auto synchronization process eliminates the manual steps When you adopt the auto synchronization process model, then all processes in the method library are automatically synchronized. When you create a new method library, you have the choice to synchronize automatically, but you cannot use both methods. For tailoring processes, a manual synchronization is always required.

When creating descriptors like Task Descriptor, Role Descriptor, or Work Product Descriptor in an auto-synchronized process, a local copy of the attributes and relationships for those descriptors that are inherited from linked method elements are not created. Instead, when the process is being realized, the attributes and relationships from the linked elements are pulled in directly and combined with descriptor-specific data.

You can modify the following properties of descriptors:

Text attributes: Replace

Relationship attributes: Exclude or Include associations that are inherited from the linked method elements

Relationship attributes: Add or Remove the associations you make locally on the descriptors

Working:

ASU This unit tests the realization of ideal conditions of synchronization. At the correct instant this unit gives control logic signals to circuit breaker and changeover switches S1 and S2 to select the appropriate configuration of active and reactive power.

The ASU checks the grid voltage and the voltage form the microgrid control output and creates a signal which is sent to switches and breakers to control the operation. I am unsure exactly how this system is implemented and the reference does not specify any detail of the design of the simulink block. I would like some assistance if possible.

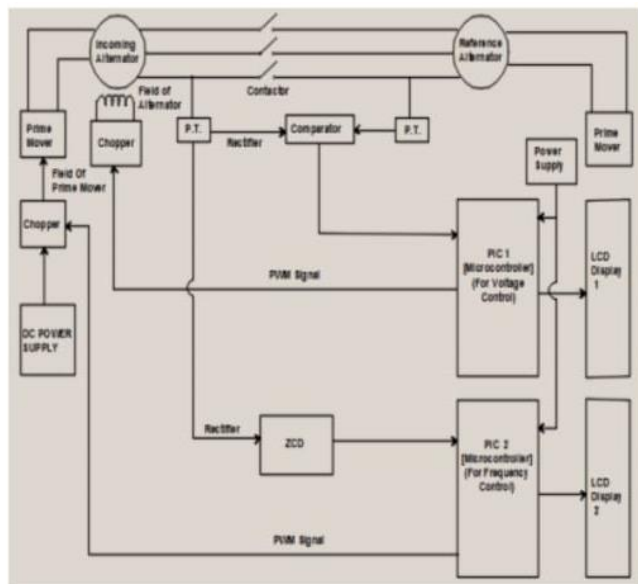
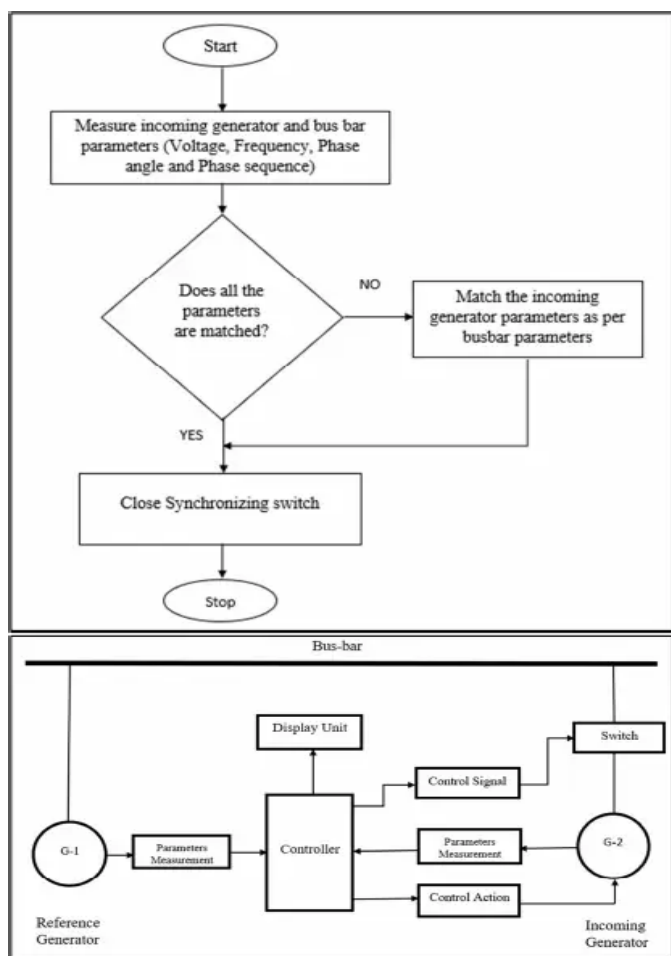


Fig. Block Diagram of Automatic Synchronisation unit



3. Problem Statement :

If there is some malfunction in the main PIC, the system may misbehave.

Individual protection circuit is required for each alternator.

3. CONCLUSIONS

The automatic synchronisation of alternator is having several advantages over the manual conventional methods by synchronizing the alternators the capacity of the grid can be increased to meet huge load demand. And also we can improve the whole power scenario. The automatic synchronisation is achieved by using the PIC microcontroller, by automatically adjusting the magnitude of voltage and frequency.

REFERENCES

- [1]. B.L. Theraja, A.K. Theraja, a text book of electrical technology.
- [2]. Ashfaq Hussain, Dhanpat Rai & Co. (Pvt) Ltd., Electric Machines.
- [3]. Dr. P.S.Bimbhra, Khanna Publishers, Power Electronics.
- [4]. The 8051 microcontroller & embedded systems, Mazidi & McKinlay.
- [5]. Research article by Rohan Ingle, Abhay Halmare "Automatic synchronisation of alternator for small power plants".