# Design and Development of Fly-back Converter for 18-Pulse Switched Mode Power Supply

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| **Student's Name** | **S. Sachin** | **EMPE (FT-2012)** |
| **Academic Supervisor(s)** | Shrikant M. Misal and V. S. N. SitaramGupta | |
| **Industrial Supervisor(s)** | | |

**S. Sachin**
sachins.schns@gmail.com
Ph. No: 0 80950 69672

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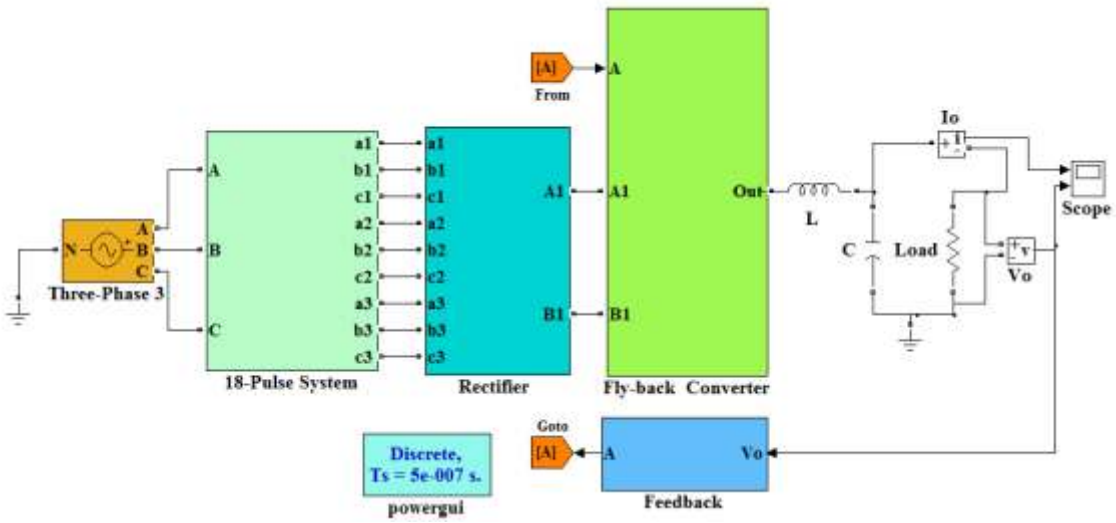
**Abstract:**

Switch Mode Power Supply (SMPS) converts AC or unregulated DC voltage to regulated DC voltage. 18-pulse input SMPS system forms an integral component of modern day power supply systems. They have a DC-DC converter which has inverters, high frequency transformers and a rectifier. To reduce multiple voltage conversion requirements and increase the overall efficiency, 18-pulse SMPS system using Fly-back converter is proposed in this project.

The project aims to design and develop 18-Pulse Fly-back Converter SMPS System. The first phase of the project is to model and simulate 18-pulse along with three phase full wave rectifier to convert AC input voltage to unregulated DC output voltage. The next phase is to design and develop fly-back converter to avail regulated DC output. Fly-back converter uses coupled inductor arrangement along with MOSFET and diode. The regulated output voltage is controlled using PI controller.

Fly-back converter for 18-pulse SMPS system is modelled and simulated using MATLAB Simulink. A comparative analysis of performance parameter for 18-pulse SMPS system using high Frequency Transformer (HFT) and 18-pulse SMPS system using Fly-back converter in terms of efficiency, reliability, complexity and cost effectiveness has been carried out. The simulation studies have shown that implementation of fly-back converter has increased its efficiency by 11.96% and reduced overall cost by 15.15%. Power factor of the system is maintained at 0.997 and 1.66% more reliable when compared to the existing system, hence complexity of the system is effectively reduced.




**18 - Pulse fly-back converter switch mode power supply**