



Demo Guide - Simulation

POWER 4-5-6

START ⇨

SCREEN SETUP ⇨

1 Introduction to POWER 4-5-6

POWER 4-5-6 is the only switching power supply design program which provides component design, large-signal simulation, feedback control design, and small signal analysis in one easy-to-use package. Features of **POWER 4-5-6**, Release 9 include:

- Power stage designer
- *Magnetics designer* (included in full version, not in Control and Simulation version.)
- 9 topologies most commonly used in the industry (plus rectifier options.) All topologies in one program allow you to compare quickly and easily
- Industry's *fastest cycle-by-cycle simulation* shows true large-signal performance
- *Control loop designer* suitable for constant-frequency PWM
- *Current-mode control* using the latest and most accurate modeling techniques
- *Voltage-mode control* using the results of the PWM switch model
- CCM and DCM converter simulation and analysis
- Small-signal analysis of control system, including loop gain
- Digital compensation delay and coefficient calculation
- Two-stage input filter design and analysis
- Power stage loss and stress analysis for all major components
- Output impedance analysis
- Audiosusceptibility
- Second-stage LC filter analysis
- Snubber design and analysis
- Switching loss analysis for power FETs and IGBTs
- Control design and analysis on a single power stage schematic
- Toroid inductors with Micrometals parts.

POWER 4-5-6 is an Excel-based program with interactive controls, designed for rugged and reliable operation. All of the features listed above are offered using clear schematic presentation of circuits and designs with pop-up menus for easy data entry and analysis. Extensive on-line help is available at the click of a button.

There are three levels of application for this software. These levels are commensurate with experience and stage of your design to help you achieve the greatest value from POWER 4-5-6 without the burden of knowing the equations involved in arriving at the solution. We have defined these levels as follows:

Level 1: Basic Design

At this level, you can simply input the power requirements for your circuit. When you click “OK”, the entire converter, including control loop, is designed for you. The components are chosen for you based on your data, and these are working values which you can put into hardware with confidence.

Level 2: Intermediate Design

Level two designers have design experience and want to input their knowledge as the design progresses. They want to understand and further optimize their design. At this level, you will look carefully at the selected values from POWER 4-5-6, and change some of them to improve the design.

Level 3: Advanced Design

Level three designers not only know how to design an effective power supply— they know how to get maximum performance out of their power system for their very specific applications. They have a library of preferred parts that work well for their applications, and use these to fully optimize the design.

The magnetics design section works similarly in levels. You can view the transformer or inductor on the main design schematic and

1. Choose from simplified parameters and refer to a magnetics design house for completion;
2. Choose your own cores, wire, and other components and give the completed design to a manufacturer for production; or
3. Design the magnetics from the ground up using your own parameters and knowledge.

Regardless of your design experience, POWER 4-5-6 allows you to check and cross-check all parameters and results. You can stop at any time during the process and view resulting waveforms and control parameters.

We hope you enjoy the benefits of this interactive design tool. To learn more about the powerful capabilities of the program, we highly recommend attending one of our four-day Power Supply Design Courses. Details are found on our web site:

<http://www.ridleyengineering.com>