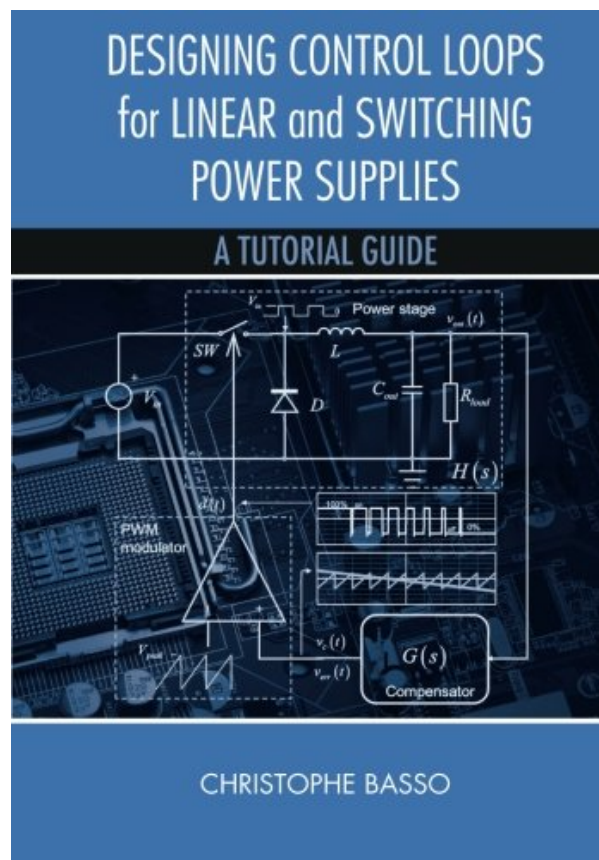


DESIGNING CONTROL LOOPS FOR LINEAR AND SWITCHING POWER SUPPLIES: A TUTORIAL GUIDE BY CHRISTOPHE BASSO

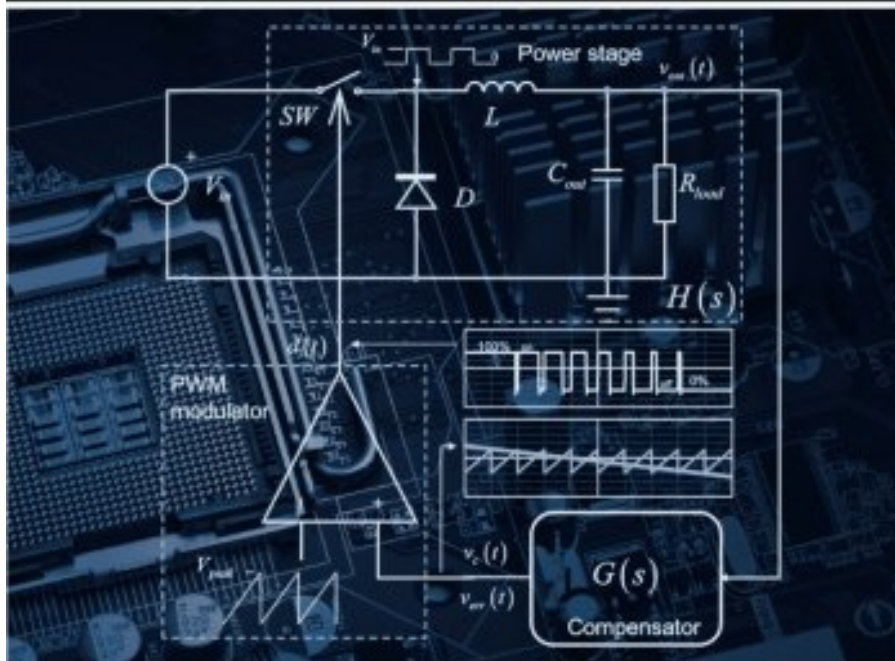


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A TUTORIAL GUIDE



CHRISTOPHE BASSO

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Learn the strategy of doing something from lots of sources. One of them is this book entitled **Designing Control Loops For Linear And Switching Power Supplies: A Tutorial Guide By Christophe Basso**. It is a very well understood publication *Designing Control Loops For Linear And Switching Power Supplies: A Tutorial Guide By Christophe Basso* that can be referred to review now. This advised book is among the all wonderful *Designing Control Loops For Linear And Switching Power Supplies: A Tutorial Guide By Christophe Basso* collections that are in this website. You will additionally find other titles and also themes from different authors to browse right here.

Review

Mr. Dennis Feucht from Innovatia Laboratories published a review of the book in the online power electronics newsletter How2Power.com:

how2power.com/newsletters/1304/H2PToday1304_bookreview_DennisFeucht.pdf

From the Author

When I started writing this book, my goal was to teach readers how to build compensation structures using various types of active elements. Actually, most of the textbooks that I owned only disclosed compensation structures using operational amplifiers. In our industry, there are other active elements that can be implemented in compensators: TL431, transconductance amplifiers (OTA) and shunt regulators. I have dedicated chapters to all of these devices, including the effects of the optocoupler in the case of isolated converters.

When these chapters were over, I decided to add theoretical information on loop control. How to tackle the subject without reproducing what already exists in good textbooks? The main idea was to narrow down the text content to what an engineer should really know for his daily job. Indeed, the world of control systems is wide and you don't need to know everything for your engineering tasks. The main idea of this book is to bridge theoretical knowledge to practical reality: derive equations and put them at work in design examples. Where phase and gain margins come from, what is delay margin, how do I link PID coefficients to poles/zeros placements and so on. As usual, I derived all equations including intermediate steps so that you can easily follow the flow. The book uses power electronics examples but theory can be equally learned and applied to other engineering fields.

This book is not a substitute to classical textbooks but it can be seen as a design companion for the engineer and as a class complement for the student. Both look for a bridge between what they have learned at university and the engineering world reality. I modestly hope this book will fulfill that goal.

Christophe P. Basso
Toulouse, 2012

cbasso.pagesperso-orange.fr/Spice.htm

About the Author

Christophe Basso is a technical engineer at ON Semiconductor (formerly Motorola Semiconductor) in France, and a frequent contributor to power electronics magazines and conferences. He is a Senior Member of the IEEE, and a graduate of the Institut Polytechnique de Toulouse, where he received a MSEE and occasionally teaches.

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Loop control is an essential area of electronics engineering that today's professionals need to master. Rather than delving into extensive theory, this practical book focuses on what you really need to know for compensating or stabilizing a given control system. You can turn instantly to practical sections with numerous design examples and ready-made formulas to help you with your projects in the field. You also find coverage of the underpinnings and principles of control loops so you can gain a more complete understanding of the material. This authoritative volume explains how to conduct analysis of control systems and provides extensive details on practical compensators. It helps you measure your system, showing how to verify if a prototype is stable and features enough design margin. Moreover, you learn how to secure high-volume production by bench-verified safety margins.

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Toulouse, 2012

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Most helpful customer reviews

10 of 11 people found the following review helpful.

Finally! A comprehensive explanation of power control in easy to understand language!

By Jon K.

Here's the short review:

If you are new to power electronics and control systems, then this is the book for you. Everything, starting with the basics, is explained in easy to understand language. If you are very experienced with power controls, then this is also the book for you. The book covers everything and probably has a few tips and tricks that you haven't seen before.

Here's the longer review:

I've been doing power electronics professionally for nearly 15 years. And the most difficult (and mysterious) part of it has always been loop control. I don't know why this is, but it is a common source of confusion among power circuit designers. Most of us learn from white papers, app notes, IC tutorials, etc. Its a very convoluted way to learn though--everyone has a slightly different take on the topic, and it just gets confusing. There are textbooks which cover some of this material. But they tend to fall into one of 3 categories. They are either rather simplistic (they only apply to a few easy situations), or full endless equations and derivations (their point gets lost), or they only include the author's "preferred" method for stabilizing power systems (and so they ignore the fundamentals).

Enter now Christophe Basso's 3rd book: "Designing Control Loops for Linear and Switching Power Supplies." (The other 2 books, particularly the "Switch Mode Power Supplies", are excellent also.) I'm sure you can find the table of contents online, so I won't repeat it here. There are 9 chapters that break the book up into basically 3 parts:

1. Fundamentals of Control (which I could also title: "things I forgot from college" or "things I 'should' know and so I'm embarrassed to ask my coworkers about"). These chapters are fantastic. All the control theory, transforms, etc. are presented in a sensible way. It takes a lot of the mystery out of understanding power control. And Basso has a very natural style of writing that puts all the material in easy to understand language--but without dumbing down the principles.
2. Op amp topologies and stabilization techniques. This also includes the most popular, and least discussed ones--the transconductance amp and the TL431.
3. How to measure and verify the loop design. Very few authors write about this, but it is one of the most important aspects to control loop design. Basso answers the why, where and how of verifying and correcting

the loop design.

Each chapter also includes examples and simulation models.

A book like this is long overdue for the power electronics community. I'm convinced it will be one of the must have books for every power designer to have in their library.

7 of 8 people found the following review helpful.

The very best book for Power Supply Control Loop Design

By P. Saint-Pierre

I have read many books and articles written on power supply control loop design and analysis, but never have I seen a more comprehensive treatment as Christophe's latest work. I highly recommend this book for beginners as well as those very skilled in the art of power supply design. As the author recommends, working through the equations yourself brings insight to a subject that is seldom treated in such analytic rigor. As a reviewer of this work, I could not wait to see it in print and very excited that Christophe put so much effort to explain in great detail an important aspect of power supply design. This is a must have for anyone who is involved in power electronics.

7 of 8 people found the following review helpful.

Creme de la creme- Basso

By Donald M. Scoggin

Mr. Basso, with the release of this book, has produced another important work sure to become a standard in power electronics and a "must have" for the college student to senior designer. Basso is able to take theory and seamlessly transform it into concise and insightful observations of real applications and circuits. Mr. Basso can take esoteric controls and s-plane plots and explain them that gives not only a solution but an understanding as well. It blends theory, reality, and practice of the past 30 years into one well written book.

I do not leave home without Mr. Basso's prior masterpiece of "Switch Mode Power Supplies" and this book is a welcome complement.

I would strongly advise anyone in design, testing, or analysis of control loops to add this tool to their toolkit.

Merci Messr. Basso!! Switch-Mode Power Supplies Spice Simulations and Practical Designs

Designing Control Loops for Linear and Switching Power Supplies: A Tutorial Guide

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